

1897.

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NEW SOUTH WALES.

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VOTES

AND

PROCEEDINGS

OF THE

LEGISLATIVE ASSEMBLY

DURING THE SESSION

OF

1897,

WITH THE VARIOUS DOCUMENTS CONNECTED THEREWITH.

---

IN SEVEN VOLUMES.

VOL. VI.

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SYDNEY:

WILLIAM APPELGATE GULLICK, GOVERNMENT PRINTER, PHILLIP-STREET.

1898.

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LEGISLATIVE ASSEMBLY.  
NEW SOUTH WALES.

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VOTES AND PROCEEDINGS.

SESSION 1897.  
(IN SEVEN VOLUMES.)

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1897.

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

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PUBLIC WORKS INQUIRY COMMISSION.

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REPORT

OF THE

ROYAL COMMISSION,

APPOINTED ON THE 21<sup>ST</sup> MAY, 1896,

To make a diligent and full inquiry touching all questions in any way raised in the Legislative Assembly of the Colony of New South Wales, whether specifically or in course of debate, as to any improper conduct in connection with the Contracts, past and present, of Messrs. Carter, Gummow, and Company, John Carter, D. G. Snodgrass, George Maddison, Peter Ewing, F. M. Gummow, George Forrest, and James Gillan with the Department of Public Works, and touching the truth of any charges so, as aforesaid, made in connection with the performance or variation (if any) of such Contracts, or the conduct of any Public Officer, or of the said Contractors, their Agents, or Workmen, in relation thereto; and to make the fullest investigation into any charge or matter in relation to the said persons and Contracts;

TOGETHER WITH

MINUTES OF PROCEEDINGS AND EVIDENCE,

APPENDICES AND PLANS.

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*Printed under No. 2 Report from Printing Committee, 6 May, 1897.*

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SYDNEY: WILLIAM APPLGATE GULLICK, GOVERNMENT PRINTER.

1897.

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## COMMISSION.

VICTORIA, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen,  
Defender of the Faith, and so forth,—

To our trusty and well-beloved—

CHARLES EDWARD ROBERTSON MURRAY, Esquire, one of the District Court Judges for the Metropolitan, Suburban, and Hunter District of Our Colony of New South Wales,—

Greeting:—

Know you, That We, reposing great trust and confidence in your ability, zeal, industry, discretion, and integrity, do, by these presents, authorise and appoint you, to make a diligent and full inquiry touching all questions which have been in any way raised in Our Legislative Assembly of Our said Colony of New South Wales, whether specifically or in course of debate, as to any improper conduct in connection with the Contracts, past and present, of Messrs. Carter, Gummow, and Company, John Carter, D. G. Snodgrass, George Maddison, Peter Ewing, F. M. Gummow, George Forrest, W. J. Snodgrass, and James Gillan with the Department of Public Works, and touching the truth of any charges which have been so as aforesaid made in connection with the performance or variation (if any) of such contracts, or the conduct of any Public Officer, or of the said Contractors, their Agents, or Workmen, in relation thereto: We also authorise you to make the fullest investigation into any charge or matter in relation to the said persons and Contracts which may be brought before you during the course of your inquiry: And we do, by these presents, grant to you full power and authority to call before you all such persons as you may judge necessary, by whom you may be better informed of the truth in the premises, and to require the production of all such books, papers, writings, and all other documents as you may deem expedient, and to visit and inspect the same at the offices or places where the same or any of them may be deposited; to visit and inspect any works executed or in course of execution under the said Contracts, and to inquire of the premises by all lawful ways and means: And We do give you power, at your discretion, to procure such assistance as you may deem necessary for enabling you duly to execute this Our Commission: And Our further will and pleasure is that you do, within two months after the date of this Our Commission, certify to Us, in the office of Our Chief Secretary, under your hand and seal, what you shall find touching the premises: And We hereby command all Government Officers and other persons whomsoever within Our said Colony, that they be assistant to you in the execution of these presents: And We do hereby declare this Our Commission to be a Commission for all purposes of the Act 44 Victoria No. 1, intituled, "*An Act to regulate the taking of evidence by Commissioners under the Great Seal.*"

In testimony whereof, We have caused these Our Letters to be made Patent, and the Great Seal of Our said Colony of New South Wales to be hereunto affixed.

Witness Our Right Trusty and Well-beloved Cousin, HENRY ROBERT, VISCOUNT HAMPDEN, Our Governor and Commander-in-Chief of Our Colony of New South Wales and its Dependencies, at Government House, Sydney, in New South Wales aforesaid, this twenty-first day of May, in the year of Our Lord one thousand eight hundred and ninety-six, and in the fifty-ninth year of Our Reign.

(L.S.)

HAMPDEN.

(L.S.)

By His Excellency's Command,  
JAMES N. BRUNKER.

Entered on record by me, in REGISTER OF PATENTS, No. 17, page 433, this twenty-first day of May, one thousand eight hundred and ninety-six.

For the Colonial Secretary and Registrar of Records,

(L.S.)

CRITCHETT WALKER,  
Principal Under Secretary.

## EXTENSIONS OF COMMISSION.

ROYAL COMMISSION to inquire into charges in connection with the contracts of Messrs. Carter, Gummow, & Co., John Carter, D. G. Snodgrass, George Maddison, Peter Ewing, F. M. Gummow, George Forrest, W. J. Snodgrass, and James Gillan with the Department of Public Works.

WHEREAS it is necessary to extend the time within which the Commissioner is to make his report in the above matter: Now, therefore, I do hereby, with the advice of the Executive Council, extend the time within which the said Commissioner is to make such report for the period of one month—to take effect from the 21st instant.

Given under my hand, at Government House, this 20th day of July, 1896,

HAMPDEN.

By His Excellency's Command,  
JAMES N. BRUNKER.

---

ROYAL COMMISSION to inquire into certain charges in connection with the contracts between Messieurs Carter, Gummow, & Co., John Carter, D. G. Snodgrass, George Maddison, Peter Ewing, F. M. Gummow, George Forrest, W. J. Snodgrass, and James Gillan, and the Department of Public Works.

WHEREAS the time appointed for the return of the Commission in the above matter was, by an instrument dated the 20th day of July last, extended for a period of one month: And whereas it is necessary to extend the same still further: Now, therefore, I do hereby, with the advice of the Executive Council, extend the time within which the Commissioner is to make his return to and for a further period of two months beyond the time in and by the aforesaid instrument appointed for the purpose—to take effect from the 21st instant.

Given under my hand, at Government House, Sydney, this 11th day of August, 1896,

HAMPDEN.

By His Excellency's Command,  
JAMES N. BRUNKER.

---

ROYAL COMMISSION to inquire into certain charges in connection with the contracts between Messieurs Carter, Gummow, & Co., John Carter, D. G. Snodgrass, George Maddison, Peter Ewing, F. M. Gummow, George Forrest, W. J. Snodgrass, and James Gillan, and the Department of Public Works.

WHEREAS the time appointed for the return of the Commission in the above matter was, by an instrument dated the 11th day of August last, extended for a period of two months: And whereas it is necessary to extend the time still further: Now, therefore, I do hereby, with the advice of the Executive Council, extend the time within which the Commissioner is to make his return to and for a further period of one month beyond the time in and by the aforesaid instrument appointed for the purpose—to take effect from the 21st instant.

Given under my hand, at Government House, Sydney, this 20th day of October, 1896,

HAMPDEN.

By His Excellency's Command,  
JAMES N. BRUNKER.

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## LETTERS OF INSTRUCTION.

Sir,

The Treasury, New South Wales, Sydney, 19 May, 1896.

I have the honor to inform you that His Excellency the Governor, with the advice of the Executive Council, has been pleased to approve of your appointment as Royal Commissioner to inquire into the charges made against certain officials in the Department of Public Works with reference to the contracts between that department and Messrs. Carter, Gummow, & Co., and with power to investigate, to the fullest extent, all matters that may arise during the course of your inquiry with reference to such contracts, and the conduct of the contractors or their agents and workmen, and the conduct of any public officer in connection with the same.

His Honor Mr. District Court Judge Murray, Sydney.

I have, &amp;c.,

G. H. REID.

Sir,

Chief Secretary's Office, Sydney, 21 May, 1896.

I am directed by the Chief Secretary to forward to you, enclosed herewith, a Commission, issued by His Excellency the Governor, with the advice of the Executive Council, under the Great Seal of the Colony, appointing you to be a Royal Commissioner to make a diligent and full inquiry touching all questions which have been in any way raised in the Legislative Assembly, whether specifically or in course of debate, as to any improper conduct in connection with the contracts, past and present, of Messieurs Carter, Gummow, & Co., John Carter, D. G. Snodgrass, George Maddison, Peter Ewing, F. M. Gummow, George Forrest, W. J. Snodgrass, and James Gillan with the Department of Public Works, and touching the truth of any charges which have been so as aforesaid made in connection with the performance or variation (if any) of such contracts, or the conduct of any public officer, or of the said contractors, their agents, or workmen, in relation thereto; and authorising you further to make the fullest investigation into any charge or matter in relation to the said persons and contracts which may be brought before you during the course of your inquiry.

2. I am desired to add that you will be provided with the services of a shorthand writer from the Parliamentary Hansard Staff.

I have, &amp;c.,

CRITCHETT WALKER,

Principal Under Secretary.

Charles Edward Robertson Murray, Esq., District Court Judge.

Sir,

The Treasury, New South Wales, Sydney, 23 July, 1896.

I am directed by the Honorable the Premier to transmit to you, enclosed herewith, an instrument under the hand of His Excellency the Governor, extending the Public Works Inquiry Commission for a period of one month, to take effect from the 21st instant.

I have, &amp;c.,

F. KIRKPATRICK,

Under Secretary for Finance and Trade.

His Honor the Public Works Inquiry Commissioner, &amp;c.

Sir,

Chief Secretary's Office, Sydney, 13 August, 1896.

With reference to your letter of the 10th instant, addressed to the Prime Minister, and by him transmitted to this office, I am directed by the Chief Secretary to forward herewith an instrument, under the hand of His Excellency the Governor, with the advice of the Executive Council, extending the time within which the Report of the Public Works Inquiry Commission is to be made for a further period of two months beyond the time appointed for the purpose—to take effect from the 21st instant.

I have, &amp;c.,

CRITCHETT WALKER,

Principal Under Secretary.

Charles Edward Robertson Murray, Esq., District Court Judge.

Sir,

Chief Secretary's Office, Sydney, 21 October, 1896.

With reference to your letter of the 7th instant, addressed to the Premier, and by him transmitted to this office, I am directed by the Chief Secretary to transmit herewith an instrument, under the hand of His Excellency the Governor, with the advice of the Executive Council, extending the time within which the Report of the Public Works Inquiry Commission is to be made for a further period of one month beyond the time appointed for the purpose—to take effect from the present date.

I have, &amp;c.,

CRITCHETT WALKER,

Principal Under Secretary.

Charles Edward Robertson Murray, Esq., District Court Judge.

## PUBLIC WORKS INQUIRY COMMISSION.

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REPORT.

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To His Excellency the Right Honorable HENRY ROBERT, VISCOUNT HAMPDEN, Governor and Commander-in-Chief of the Colony of New South Wales and its Dependencies.

MAY IT PLEASE YOUR EXCELLENCY,—

Your Commissioner received, on the 21st of May last, your Excellency's Commission directing him to make a diligent and full inquiry touching all questions which have been in any way raised in the Legislative Assembly of the Colony, whether specifically or in course of debate, as to any improper conduct in connection with the contracts, past and present, of Messrs. Carter, Gummow, & Company, John Carter, David Graham Snodgrass, George Maddison, Peter Ewing, Frank Moorhouse Gummow, George Forrest, and James Gillan, with the Department of Public Works, and touching the truth of any charges so as aforesaid made in connection with the performance or variation (if any) of such contracts, or the conduct of any public officer, or of the said contractors, their agents, or workmen, in relation thereto; also to make the fullest investigation into any charge or matter in relation to the said persons and contracts. Your Commissioner, having executed, to the best of his ability, your Excellency's Commission, has now the honor to present his Report.

Your Commissioner has found it necessary to hold no less than sixty-six sittings, the whole of which have, with two exceptions, been devoted mainly to the examination of 114 witnesses, the minutes of whose evidence will be found to cover 725 pages. A necessarily careful review of this testimony has to some extent delayed the completion of the duty entrusted to your Commissioner.

The terms of your Excellency's Commission having empowered your Commissioner to make inquiry touching all questions "in any way raised" in the Legislative Assembly, "whether specifically or in course of debate," your Commissioner perused the whole of the *Hansard* reports of the debates which could be discovered to contain references to the contracts of Messrs. Carter, Gummow, & Company with the Department of Public Works. The speeches which appeared exclusively to contain allegations affecting the Department of Public Works in relation to the aforesaid contracts were those delivered by Mr. Varney Parkes on the 26th of September, 1895, and the 12th of May, 1896.

Before beginning the inquiry your Commissioner requested Mr. Parkes, for the convenience of investigation, to submit to the Commission, tabulated under the headings of the several contracts to which he had referred, a statement of the allegations he intended to rely upon, it being understood that he would be at liberty to prefer further charges in the same relation at any time during the progress of the inquiry. Mr. Parkes, on the 27th May, handed to the Commission a list of charges. It appears in the appended minutes of proceedings that, on various subsequent dates, Mr. Parkes added charges to this list, and that on the 4th of September he withdrew the entire list then before the Commission, and substituted therefor an amended list, from which some of the preceding charges were omitted, and in which others were amended in more or less important particulars. Further amendments were suggested by Mr. Parkes in the course of the lengthy address he delivered on the presumed termination of the evidence.

The

The charges, in the amended form in which they were put by Mr. Parkes on the 4th of September, appertaining to each contract, are placed in this Report at the head of that portion which deals with those particular allegations; and, where practicable, each charge is supplemented by Mr. Parkes's remarks made in Parliament on the same subject matter, extracted from *Hansard*.

Mr. Parkes does not appear, however, to have referred in his speeches to the matters contained in certain of the allegations which he afterwards laid before the Commission, nor does his final statement of those allegations include some of the matters to which he made specific reference in his speeches, which will be found recorded *in extenso* on the minutes of the proceedings of the Commission immediately preceding the record of Mr. Parkes's address.

An endeavour was made by Mr. Parkes to tender evidence relating to the various contracts in a given order; but this method of procedure was unfortunately found to be impracticable by reason of the necessity for consulting the convenience of some witnesses, and of calling others as soon as they could be summoned.

Although your Commissioner thought fit to request Mr. Parkes to specify the improper acts of which it appeared to him Mr. Hickson had been guilty, and although Mr. Parkes, in compliance with this request, tabulated the charges, your Commissioner has still kept in view throughout the whole course of the inquiry the duty imposed by the Commission of making a full investigation unrestricted by any expression of opinion on the part of Mr. Parkes, and therefore the necessity for independent examination of any matters that might appear from the evidence, or might in any way be suggested to your Commissioner, as calling for inquiry. Mr. Parkes, however, ably assisted by Mr. Christie in matters of account and of a general business nature, and by Messrs. M'Creddie and Thompson on questions of construction and engineering, has so completely exhausted all the fair possibilities of the subject matter as to leave no necessity for branching off into any lines of inquiry not coming under one of the various heads into which he has divided his charges; nor, when Mr. Parkes, seeing the great length to which the inquiry would extend, unless he confined himself, as he expressed his intention of doing during the course of the inquiry, to some particular contracts to which the persons named in the Commission were parties, expressed his intention of so limiting the investigation on his part, did your Commissioner deem it his duty to proceed into a further examination of any other of the contracts; being well aware that Mr. Parkes, in his zeal for the discovery of the truth, and with the assistance at his hand, would not have omitted to bring before the Commission any important piece of evidence appearing in or suggested by the history of any other contract.

Your Commissioner may also be allowed to explain that, though the Commission is general, in as far as the mention of the name of any officer of the Department of Public Works is concerned, still, from the tenor of the whole of the speeches made by Mr. Parkes in Parliament which led up to the granting of the Commission, it is abundantly evident that Mr. Robert R. P. Hickson, now Under-Secretary in that department, is the person into whose conduct it is the duty of your Commissioner primarily to inquire. It has been on that assumption that the whole course of the inquiry has been conducted; and, while your Commissioner kept in mind the duty of examining into, if necessary, the conduct of any other officer, still the attention of the Commission was directed most particularly to Mr. Hickson in that relation. And in the course of this Report your Commissioner has, in the same manner as has Mr. Parkes in the framing of his charges, directed his attention specially to this aspect of the question; the Inquiry having in effect resolved itself into an investigation into the conduct of Mr. Hickson in his dealings with and control of the contracts held by Carter & Co., and Carter, Gummow, & Co.

In reporting *seriatim* on the charges tabulated—as they appeared when Mr. Parkes began his address—your Commissioner cannot avoid dealing with some matters at great length. Considering the amount of evidence taken—21860 questions having been asked and answered—it is impossible to be brief. At the same time, your Commissioner, while deeming it his duty to rather fully explain some matters, either of public interest or having a very important bearing on the questions to be decided, has been compelled to omit all mention of, or to touch very lightly on, many subjects dealt with in the course of the inquiry. There are two of these to which a brief allusion may be made here. One is the history of Mr. Hickson's official actions in South Australia.

This

This subject was introduced thus: Mr. Parkes, in the course of his evidence, spoke, in justification of his own action in Parliament, of some information which he had received casting a reflection upon Mr. Hickson's conduct when in the service of the South Australian Government. This led to cross-examination of Mr. Parkes on the subject, and, finally, to the putting in as evidence, so as to have them before the Commission, and so before the public, the whole of the material facts that were to be found in print. They appear in the Appendix No. 63, page 118, and consist of Mr. Hickson's evidence given in the hearing of an arbitration matter between Wells Brothers, contractors, and the Government of South Australia (a case in which the award was absolutely in favour of the defendants), part of Mr. Thomas Higginbotham's evidence, and his Report on Harbour Works. Mr. Hickson was examined on these matters—page 561 of the evidence. It is quite outside of the province of your Commissioner to attempt to determine the question whether Mr. Hickson acted properly or improperly in his dealings with Mr. Cheesewright in the matter of the plans for the Rivoli Bay and Kingston jetties; it would be impossible to do so satisfactorily at this time and place. Mr. Higginbotham's report appears to exonerate Mr. Hickson of anything worse than imprudence. But the question is really not material. In dealing with the evidence adduced on this inquiry your Commissioner has in no way entertained the question of character. If there had been sufficient proof to raise a strong suspicion against Mr. Hickson, and if, in answer to that, there had been set up the improbability that so honorable a man could be guilty of such conduct, then it would have been quite legitimate to reply that his former history went to contradict the assertion of high integrity. This is not so here. It was—after Mr. Parkes's unnecessary assertion, made to justify himself—at the wish of both Mr. Parkes and Mr. Hickson that the evidence was put in. It is satisfactory to Mr. Hickson that the whole matter, as far as is practicable, should be cleared up: the verdict of those who read the evidence will probably be favourable to him.

Another matter that was quite outside the scope of the inquiry was Mr. Parkes' own *bona fides* in taking the action which he pursued in Parliament. Not being a witness of any facts that go to prove his charges, his credibility was not in issue. Therefore it was that your Commissioner at first disallowed cross-examination on that subject, as being immaterial and causing waste of time. Mr. Parkes himself raised no objection; he rather invited the inquiry. Your Commissioner, on reflection, decided to allow it; seeing that, though not material in relation to the questions to be dealt with by the Commission, it may become so in connection with another matter which your Excellency's advisers may think fit to consider. All that your Commissioner, having had a peculiarly good opportunity for observation, will venture to say upon this point is that, through the whole course of the inquiry, Mr. Parkes, in his words and by his manner, expressed, and appeared to be actuated by, a strong belief in the substantial truth of his allegations.

Your Commissioner will now proceed to deal with the charges *seriatim*, in the order—though it is unfortunately not chronological—in which they were arranged by Mr. Parkes—the numerical order borne by the contracts, not according to the respective dates at which they were let, but according to the sequence in which the several plans belonging to them were drawn. Before doing so, however, it will be convenient, for the purpose of reference, to give the three lists which follow, the first explaining shortly the offices held by Mr. Hickson and Mr. Darley; the second showing the various combinations of persons named in the Commission, as they joined together in carrying out contracts in New South Wales; and the third being an interpretation of initials appearing in minutes cited.

| R. R. P. HICKSON.   |                     | C. W. DARLEY.   |                     |
|---|---------------------|---|---------------------|
| Appointed Commissioner for Roads and Bridges, and Engineer-in-Chief for Sewerage, in succession to the late W. C. Bennett.      | 1889.<br>July 1st.  | Appointed Engineer-in-Chief for Harbours and Rivers in succession to Mr. E. O. Moriarty (retired).  | 1889.<br>January 1. |
| Appointed Engineer-in-Chief for Public Works (Roads and Bridges, Harbours and Rivers, Country Towns Water Supply and Sewerage). | 1895.<br>April 1st. | Appointed President Water and Sewerage Board and Engineer-in-Chief Metropolitan Sewerage Construction Branch.<br>(Mr. Smail acting from April to June.)   | 1895.<br>April 1.   |
| Appointed Under-Secretary for Public Works and Commissioner for Roads.  | 1896.<br>March 5.   | Appointed Engineer-in-Chief for Public Works (Bridges, Harbours and Rivers, Country Towns Water Supply and Sewerage).<br>Mr. Smail then acted as Engineer-in-Chief for Metropolitan Sewerage until June 30, when Mr. J. Davis was appointed Engineer for Metropolitan Sewerage. | 1896.<br>March 5.   |



| No. of Contract. | Style or Firm.                | Names of Persons comprising Firm.  | Date of Signing Contract. |
|------------------|-------------------------------|--|---------------------------|
| 22               | Snodgrass and Gillan .....    | David Graham Snodgrass and James Gillan.....   | 2 Nov., 1886              |
| 21               | Rochester and Gummow .....    | Joseph John Rochester and Frank Moorhouse Gummow* .....  | 23 ,, 1886                |
| 30               | Gummow, Bennett, and Canty... | Frank Moorhouse Gummow, Edward Bennett, and Michael Canty.                                     | 30 June, 1887             |
| 68               | Gummow & Co. ....             | Frank Moorhouse Gummow, James Gillan, George Featherstone Maddison, and Peter Ewing.           | 27 July, 1888             |
| †S.W.S.          | Forrest and Snodgrass .....   | George Forrest and David Graham Snodgrass.....   | 16 Nov., 1888             |
| 38               | Gummow & Co. ....             | Frank Moorhouse Gummow, James Gillan, George Maddison, and Edward Bennett.                     | 26 ,, 1888                |
| 32               | Forrest and Snodgrass .....   | George Forrest and David Graham Snodgrass .....  | 5 July, 1889              |
| 45               | Carter & Co. ....             | John Carter, Charles Richards,† and David Graham Snodgrass                                     | 16 April, 1890            |
| 56               | Do .....                      | John Carter and George Forrest.....  | 23 June, 1890             |
| 60               | Do .....                      | do do .....  | 23 ,, 1890                |
| 61               | Do .....                      | John Carter and David Graham Snodgrass .....   | 25 Aug., 1890             |
| 53               | Do .....                      | Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing.                        | 13 Sept., 1890            |
| 63               | Gummow and Gillan.....        | do do do do .....  | 19 Dec., 1890             |
| 66               | Do do .....                   | John Carter, David Graham Snodgrass, and George Forrest .....                                  | 12 Feb., 1891             |
| 65               | Carter & Co. ....             | do do do do .....  | 16 Mar., 1891             |
| 72               | Do .....                      | Frank Moorhouse Gummow, James Gillan, and Peter Ewing ...                                      | 6 April, 1891             |
| 74               | Gummow and Gillan .....       | John Carter and David Graham Snodgrass .....   | 10 Mar., 1892             |
| 79               | Carter & Co. ....             | Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing.                        | 21 ,, 1892                |
| 78               | Gummow and Gillan .....       | John Carter, David Graham Snodgrass, George Maddison, Peter Ewing, and Frank Moorhouse Gummow. | 22 Jan., 1894             |
| 69               | Carter, Gummow, & Co. ....    | John Carter and David Graham Snodgrass .....   | 20 June, 1894             |
| 79A              | Carter & Co. ....             | John Carter, Frank Moorhouse Gummow, and David Graham Snodgrass.                               | 16 May, 1895              |
| 77               | Carter, Gummow, & Co. ....    | do do do do .....  | 15 June, 1895             |
| 118              | Do do .....                   | John Carter, Frank Moorhouse Gummow, and George Forrest  | 19 May, 1896              |
| 108              | Do do .....                   |  |                           |

\* Mr. Gummow assigned his interest to Mr. Rochester. † S.W.S. means Sydney Water Supply.  
 ‡ Mr. Richards assigned his interest to Messrs. Carter and Snodgrass.

| Name.                    | Position at the time.                        | Initials used.   |
|--------------------------|--|------------------|
| R. R. P. Hickson .....   | Engineer-in-Chief .....                      | R.H., & R.R.P.H. |
| J. Barling .....         | Under Secretary, Public Works .....          | J.B.             |
| D. C. McLachlan .....    | Chief Clerk .....                            | D.C.McL.         |
| F. Kirkpatrick .....     | Under Secretary, Finance and Trade .....     | F.K.             |
| John See.....            | Treasurer .....                              | J.S.             |
| W. J. Lyne.....          | Secretary, Public Works .....                | W.J.L.           |
| J. H. Young .....        | do .....                                     | J.H.Y.           |
| F. C. Piper.....         | Clerk, Sewerage .....                        | F.C.P.           |
| A. Peake .....           | Surveyor, Sewerage .....                     | A.P.             |
| O. Carroll .....         | Accountant, Roads .....                      | O.C.             |
| E. Hungerford .....      | Clerk, Sewerage .....                        | E.H.             |
| J. Davis .....           | Supervising Engineer, Sewerage .....         | J.D.             |
| W. J. Millner .....      | do do .....                                  | W.J.M.           |
| C. H. Ohlfsen-Baggé..... | Principal Assistant Engineer, Sewerage ..... | C.H.O.B.         |
| S. H. Weedon .....       | Supervising Engineer .....                   | S.H.W.           |
| John Portus .....        | Chief Clerk, Works .....                     | Jno. P.          |
| Cecil Darley .....       | Engineer-in-Chief .....                      | C.D.             |
| J. W. T. Boys .....      | Supervising Engineer .....                   | J.W.T.B.         |
| W. F. Mitchell .....     | Clerk, Works .....                           | W.F.M.           |
| G. H. Rowney .....       | Resident Engineer .....                      | G.H.R.           |
| H. F. Norrie .....       | Bond Clerk .....                             | H.F.N.           |
| S. R. Corkhill.....      | Paymaster, Treasury .....                    | S.R.C.           |
| R. Y. ....               | (Page 328, Parliamentary Papers*)            |                  |

\* Printer's error. No person with these initials.

### CONTRACT 69 (MARRICKVILLE).

1. *With allowing Messrs. Carter, Gummow, & Co. to manipulate the department's schedule for Sewerage Contract 69 so as to give the contractors an advantage over the Crown in their contract to build a sewer in Marrickville, by which the contractors were paid upon the extravagant items of charge, and were conceded those items upon which they had a losing price.*
3. *With paying to the contractors large sums of money which they (the departmental officers) were not compelled to pay under Carter, Gummow, & Co.'s contract with the Crown.*

Let me show hon. members how the case stands as regards this contract, No. 69. The tenders sent in were—Carter, Gummow, & Co., £45,207; John Ahearn, £47,061; Kerle and Kerle, £52,735; H. McKenzie and Sons, £53,505; J. F. Carson, £57,239; Dean & Sons, £58,165; and so on. The completed work was much less than in the computed schedules, but Carter, & Co. were paid £52,400 instead of £45,000, or £7,400 over. They were paid, for instance, upon schedules numbered 1, 8, 12, 16, 19, 22, and so on. Supposing other contractors had had the same schedules passed for them to do the work under, there would have been a saving in the case of Ahearn, of £11,600; in the case of Kerle, of £5,000; in the case of Carson, of £10,052; in the case of McKenzie, of £8,700; in the case of Holloway Bros., of £5,700, in the case of Dean and Sons, of £4,520. Will hon. members dare to say that there was not some collusion between some officers of the department and Carter & Co., in order that they might fix their schedules? Yet the Minister paid this money away without taking the trouble to look into the schedules at all. He does not take the trouble to check the expenditure in any way. Let me show how these quantities are made out

out. I will take several cases to show hon. members how cleverly things are manipulated. Carter & Co.'s tender for excavations came to £15,500, John Ahearn's to £14,500, Dean & Co.'s to £17,000, and McKenzie's to £17,000: Carter & Co. undertook to do in open trenching 22,815 yards at 9d.; 9,780 yards at 27s. 6d., being blasting work; 1,465 yards, at 4s.; 170 feet of manual work, at 40s.; and 345 yards of blasting work, at 5s. Their schedules were so cleverly manipulated that the 9d., which was a losing rate to them, was reduced by 4,000 yards; and the blasting rate at 27s. 6d., double that of any other contractor, was increased from 9,780 yards to 13,294 yards. At the time this contract was going on there were three other members of the firm, who have since left it, and they tell me there was nothing like the amount of supposed excavation carried out; it would have to be exactly doubled to make up the increase. Again, if they had made the supposed excavation, they would have had to pay double the amount which they paid for concrete filling, which does not occur in the filling. The rates were so fixed that they could rob the state of money; and an officer who has been retired from the department, Mr. Bagge, in one minute, said that Carter, Gummow, & Co. were so fixing their schedules as to obtain an undoubted advantage over the Government. All through, this officer, Mr. Bagge, seems to have been making an effort against his superior officers, in order to secure justice to the country—

Mr. CRICK: By whom was Mr. Bagge retired?

Mr. PARKES: By the Minister, I think, upon the recommendation of the present under-secretary of the department. Then take the shafts. Carter, Gummow, & Co. put in so many shafts at a losing price. The sewers would not be any the worse for having the full number of shafts put in; but the number was reduced by seven, and then instead of being paid for blasting work at 4s. and 5s. they were paid for it at the rate of 40s. They substituted the manual labour rate for the blasting rate. It was clearly proved in the case of *Regina versus McLeod* that neither the Secretary for Public Works nor his officer had any power to in any way increase the cost of contracts by substituting a more costly material, or by adding to the price of any of the items. There is no doubt in my mind that by paying these moneys the Secretary for Public Works has illegally given away public funds. I now come to the item of "subducts." They are necessary in the case of every sewer for drainage purposes. They were estimated by the public officers at £600. One contractor contracts at £954, another at £668, another at £879, another at £1,366; another at £1,612. It will be seen that the amounts varied from £600 to £1,612. Carter & Co. put these drains in at 1d. each, or, upon the whole lot, they put down £8 16s. 8d. Eventually, however, the Government officer did not have these subducts built. There is no payment whatever for them, and as a matter of fact they were not put in.

Mr. CRICK: No wonder they were not put in when the contractors would have had to do £600 worth of work for £8 16s. 8d.

Mr. PARKES: Will hon. members tell me that this was not a prearranged affair? Do they suppose for one moment that this firm would have risked having to do £600 worth of work for £8 16s. 8d.? Was it not on the other hand a duty of the public officers to have these ducts put in at the cheap rate to the country at which they could have been put in under this contract?

Mr. ASHTON: Can the hon. member show me from the papers where the firm obtained permission to omit the subducts?

Mr. PARKES: No; but they did not do them, and they were not paid for them. Upon page 125 hon. members will see a letter written by one of the junior officers of the department to the Engineer-in-Chief for Sewerage. He says:

"As some of the man-holes on this contract are being constructed, I should like the engineer-in-chief's decision as to the kind of pitching, if any, which is to be put round the man-hole covers.

"Twelve square yards of squared bluestone pitching were included in the schedule of quantities, which the contractors have priced at £50 per square yard. The quantity likely to be used if the whole of the man-holes are to be pitched will be 35 square yards, which, at schedule rates, will amount to £1,750.

"Special bluestone concrete will answer the same purpose as bluestone pitchers, and will only cost—9 cubic yards, at 50s.—£22 10s.

"The fair price for bluestone pitching is about 25s. per square yard, and, as the schedule rate is so much higher than the market rate, the question arises whether the pitching should not be omitted. If, however, this course is considered to be unfair to the contractors, then only the quantity included in the schedule of quantities need be carried out."

The engineer-in-chief in his minute says this:

"We cannot in fairness omit an item for which, no doubt, the price is absurdly high, while we know that on other items the price is equally low. Where bluestone pitchers are shown on drawing contractors must be paid for same at schedule rates."

But I will show that they have selected all the high items on which to pay these contractors. To show the iniquity of this, I may say that they not only pay £50, but they increase it twofold by taking out the sandstone where it is provided and putting in bluestone. If that is not an act against the interests of the country, I should like to know what is. A certain number of sandstone pitchers are to be put in. These are withdrawn and bluestone substituted. That is to be seen in the payments made to the contractors. I can show that they have carefully manipulated every one of these items, so that the country suffers and the contractors gain.—*Hansard*, 12th May, 1896.

I see from the Government vouchers that the Minister paid away £6,200 in extras upon that contract. I should like to know if he ever inquired what this £6,200 was for? Did he know what it was for when he approved of it?

Mr. YOUNG: Where is the page upon which my minute approving of it appears?

Mr. PARKES: On page 134, the hon. gentleman will find this entry:

"Minister's approval for £6,200."—*Hansard*, 12th May, 1896.

Before the charges made under the head of this contract are dealt with, a clear understanding of the nature of what is known as "schedule rigging" is necessary. In England, as well as in the Colonies, a system known as "tendering by schedule" has almost universally prevailed as the accepted and proper mode, in all works of the general class to which sewer construction belongs, in which there is necessarily much uncertainty as to the kind and quantities of excavation, material, &c., that will actually be required; the nature of the ground to be excavated varying in itself, and thereby entailing variations in the extent of excavation, the mode of construction, the necessity for certain works which may or may not turn out to be required, the use and the withdrawal, or the burying in the work, of timber in shafts and tunnels, and in numbers of other ways. The usual mode of calling for tenders on this system that has been adopted in New South Wales is this:—First of all, it is determined what work is required to be constructed; then, by careful survey, the taking of borings, &c., the best available knowledge is gained of the nature of the country to be gone through, consistent, in the testing by bores, &c., with fair economy; then there is made as exact an analysis as, in the opinion of the engineer dealing with such matters, is thought expedient, of the various distinct kinds of ground that may be met with, and the different modes of working that may have to be adopted in each. There is worked out as good  
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an estimate as the conditions will permit of the quantities, in cubic measurement, of the ground likely to be met with under each head; then every conceivable kind of material that may be required in the work is added to the list. These form the first column of the schedule; opposite each item is placed in the next column the unit of measurement adopted; and in another column is given the best estimate that can be made—sometimes necessarily little better than a guess—of the “probable quantity” or number of units that may be expected. The tenderer is asked to set his price per unit against each item; the prices multiplied by the quantities give the resultant cost under each head; the sum of all these amounts, added up at the bottom of the schedule, is the sum total of the tender. It is clear that, if all the probable quantities given are correct, then the sum total will finally agree with the actual cost of the work; this will be so, however inappropriate the respective prices given may be; and the acceptance of the lowest tender will prove to be the best bargain for the country. But a departure in the work from the quantities anticipated will—unless all departures happen to balance one another—necessarily cause a variation, in the final cost, from the sum total of the tender; either by way of increase or diminution, according as the more or the less expensive items are respectively increased or diminished; and, seeing that a difference of opinion may be expected in all tenderers as to the respective values of different kinds of work, it may finally turn out that the better bargain would have resulted from the acceptance of some other than the lowest tender. But, of course, the very object of the system is to find, by taking the sum total, which tender is presumably the lowest; and, necessarily, the practice has universally been—apart from other objections—to accept the lowest tender. It is because of the need for a comparison between tenders that “probable quantities” are inserted; otherwise, to save the raising of a question in the course of the work as to the price of an unspecified item—always a difficult and unsatisfactory matter to deal with, in spite of conditions designed to meet it in the contract—all work and materials might be tendered for per unit, without quantities being given. As it is, the Department guards itself carefully against being supposed to guarantee the quantities; leaving the tenderer to make, if he chooses, his own calculations, on the basis of the exhibited plans, which show all the information acquired by the Department.

As long as tenderers used their knowledge and experience in arriving at the best conclusions they could form of the price for which they could carry out each individual item, and attached their prices accordingly, this system worked well; at the first blush it appears to be as good a system as could be devised. Evidently the most obvious alternative, a plan of lump-sum tendering, would, where quantities are necessarily uncertain, have introduced a very great risk; and this would have necessitated a large balance of probable profit to the contractor, by way of insurance against heavy possible loss, and so would have raised generally the price of work to the country. The element of gambling must have been forced to enter largely into such a system of tendering. Big profits and bankruptcies might be looked for as the result. But every uncertainty in business induces speculation; and so there gradually grew up, from the schedule form of tendering, a system of “schedule rigging,” as it was called. It is worked thus: The tenderer increases beyond its legitimate amount the price per unit of each item in which he thinks or hopes the “probable quantity” will turn out to be less than the actual quantity, and compensates for the consequent addition to his price, so as to keep down the sum total, and secure the acceptance of his tender, by unduly lowering the prices of items that he expects to work out below their “probable quantities.” Of course, the most outrageous “rigging” will eventually make no difference if the probable quantities turn out to be correct; but, if the tenderer’s hopes are fulfilled, he makes an undue profit; if he is mistaken in his expectation, the Department probably gains. On the whole, the aggregate results of a long series of sewerage contracts tendered for on the schedule system appear to show that in the end gains fairly balance losses; but the practice of “rigging” is obviously objectionable, and some remedy was required. The evil was increasing; the filling in of schedules was becoming an art. One of the contractors most proficient in this art in Australia was Mr. Snodgrass, a member of the firm of Carter & Co., and, till the end of 1895, of the firm of Carter, Gummow, & Co. Of course the system deserves the name of gambling. It is more obviously so than are most forms of speculation looked upon as legitimate. It was coming to be recognised among contractors as something quite in the ordinary course of business; and

and it naturally led to the taking advantage of every peculiarity in a schedule, even an obvious clerical error. As far as success in this art is concerned Mr. Snodgrass yields the palm to Mr. Williams, one of whose tenders for pipe-laying at the Glebe, accepted by the Water and Sewerage Board, secured him a large illegitimate profit as the result of a remarkably speculative schedule. Yet Mr. Williams was a prime mover in the agitation which resulted in the granting of this Commission. He evidently thought his own smartness nothing to be ashamed of. Mr. Snodgrass' view of the matter will be found in his evidence on page 699, Q. 21218.

When tenders were invited for Contract 69, known as the Eastern Main Branch Sewer, running through Marrickville, and carrying the Western Suburbs drainage towards the Botany Sewage Farm, a very elaborate schedule was prepared by Mr. Bagge in order to distinguish perfectly every kind of excavation, and to prevent the risk of any sort of soil or rock falling under a wrong head. In tendering for the contract Mr. Snodgrass, who seems always to have performed this part of the work of the firm, adopted a remarkably simple mode of filling in his schedule. Appendix No. 52, page 82, shows the column of work in full; No. 43, page 71, shows all schedules, including Carter, Gummow, & Co.'s. For each of the four first items, excavation in open trenches, he put down the same price, expecting to find little but what would come under the first head—comparatively easy work, though even then cheap at the price. For each class of excavation in tunnels he again gave the same price, expecting that the work would turn out to be such as would fall mostly under head No. 5, for which the rate charged was high; or that, if it were "hard rock," it would, according to the usual practice of the department, come under head 11—blasting with four-inch charges. For work under most of the other heads the price, though a good one, was lower than the department's estimate; for excavation in shafts, again, Mr. Snodgrass gave low rates in two uniform classes for all the eight different heads, except one; for that he fixed a very high price; it was the class of ground that, considering the features of the country, of which he had very large experience, he naturally expected would prevail, in excess of what was given in the probable quantities; moreover—both in tunnels and in shafts—when, in the place of harder ground, this soft ground is met with, the result is that the total quantity of easy excavation is increased, because it belongs to the class which requires timbering; and the fixing of timber in a shaft or tunnel entails a very great addition to the quantity of soil to be removed; so that, while the increased facility of taking out the ground makes the profit greater, the advantage gained is added to—if the price is high—by the consequent addition to the total amount of such profitable work.

For these items of excavation, nineteen in all, the principal peculiarity in the tendering was uniformity, in four series; with the exception of a very high price for one item, in which an increase was reasonably to be expected; with very low rates for some items—the first four—in which evidently the tenderer hoped for a decrease, because he anticipated that so much timbering in open trenches as the department expected would not be required; good prices for tunnelling, which would turn out very profitable if the ground proved generally to be soft shale; and low rates for all shaft work, with the one exception noticed. There is nothing in these prices suggestive of special information derived from any one in the office, except in relation to Nos. 13, 14, and 15. The speculation indulged in as to all the rest appears quite natural—just what might fairly be expected under the circumstances. It must be remembered that the remarkable lowness of some prices was essential to keep down the total, increased by the other high rates. A high total would lead to a failure to secure the contract. Uniformity in items under one general head is an advantage to all concerned, as it saves the trouble, and often the friction, due to the necessity of classification; aggregate measurement being all that has to be agreed on. In the result the anticipation of the tenderer generally turned out correct. The excavation in open trenches was somewhat less than the quantity given in the probable quantities; in the tunnels in "less hard ground" it proved a great deal more; in those in "solid rock" a little more; in the shafts in "solid rock" very much less; and in "more or less hard ground" some 20 per cent. more, the item put down at the high rate (40s.) being exceptionally increased, and almost entirely merging the other heads—the addition to the total being due to the larger excavation required by the larger quantity of timbered ground. In reading this schedule it must be borne in mind that the descriptions "more or less hard materials," "solid rock," and "more or less

less hard ground," identify particular local parts of the work, so marked on the ground plan and longitudinal sections exhibited. There is no guarantee that any one division of these local parts will actually answer to such description; as indeed the forms of the detailed items themselves imply.

The diminution, in the result, of 12, 13, 14, and 15, (from an aggregate of 1,465 to 495 yards) was explained by an alteration of the scheme while the work was going on by reduction in the number and the size of shafts, and notably of what was to be a very large and elaborate shaft at Premier-street, sunk by another contractor, and intended to be very much increased in horizontal section, as part of the work of Contract 69, but finally, for the sake of economy, left as it was originally sunk. It might be suggested that someone in the office conveyed to the contractors information, before the tenders were sent in, that alterations would be made; on the other hand, it was well-known that economy was being studied in every way: and Mr. Snodgrass, with his long experience of such works, and his knowledge of Mr. Davis's very commendable habit of trying by every legitimate means to reduce expense without sacrificing efficiency, might well think it safe to make a set off against his high prices by lowering these, on the chance of the quantities being reduced. The prices would certainly have been losing ones, if the shafts had been carried out as they stood in the schedule.

The next item to which attention has been called is No. 31—timber left in excavations, 1d. a cubic foot. There is really nothing peculiar in this; in the result, a considerable increase in this item did take place, due to the quantity of timber used and not withdrawn in tunnels and shafts, the quantity, however, did not increase in proportion to the increase in the timbered excavation; this is explained by the fact that, as anticipated by Mr. Snodgrass, there was a diminution in the amount of timber used in open trenches, in comparison with the quantity estimated for that work. But the increase did not really represent a loss to the contractors, because their high prices for ground requiring timbering in tunnels and shafts really included—and was calculated originally to include—the timber; the 1d. was a mere nominal price.

The 1d. per lineal yard for subducts is the next striking item. In point of fact subducts are put in for the convenience of the contractor, when they are used at all. They have hardly ever been used in sewerage work about Sydney, as it has been found that they are very seldom required and are a source of weakness. They are drains running under the floor of the tunnel, carrying soakage water towards each shaft, from a point at about the centre of the distance between the two shafts, where it falls into the sump, a sort of temporary well at the bottom of the shaft. If subducts are made at all, obviously the work must be good, as it has to be permanent, the sewer being built over the subduct; and it is so provided in the specification. It is seldom practicable to carry away the subduct water by connecting the sump with some lower level. The practice is to empty the sump of water and fill it up with concrete when the sewer is built, and so put the subducts out of work; then they evidently become worse than useless, as they tend to collect water at the foot of each shaft—water which cannot escape. As they *may* possibly be required, they are put in the schedule, with probable quantities representing in the aggregate the length of tunnel; the different classes of subduct, suitable to different conditions of ground, having different lengths roughly apportioned to them. Of course the price, 1d. per yard, was nominal; but the excavation for subducts is also paid for. The schedule item "subducts" covers the cost of the earthenware pipes, and some other items of work, but not the excavation. Where the price for excavation in tunnels is high, the payment under that head fully covers the whole cost of the subduct. Mr. Davis's table on page 499—further explained on page 664—of the evidence, sets this out clearly, and shows that, if subducts had been ordered in this contract, they would really have been a profitable item to the contractors. The suggestion that the contractors put in a nominal price because they had private information that subducts would not be required has absolutely nothing in it, for the reasons given—that the price was not nominal under the circumstances, and that all contractors who knew anything of sewerage work were aware that subducts were almost universally an item put in merely to get a price. And it must of course be borne in mind that, while the existence of subducts was a disadvantage to the work, their cost—not nominal, because it would include highly-paid excavation—was so much saved to the department by their being left out.

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The next head of work that calls for comment is No. 34—cement facing—carrying a high price, 5s. per square yard, 2s. being the departmental estimate. In this instance Mr. Snodgrass made a mistake; and the fact that he did so is some evidence to go towards rebutting the suggestion founded upon his correct anticipation of reduction of quantities in the low-priced shaft excavation. Of course the high rate set down for cement facing entailed an increase to the total amount of his tender that must have been compensated for somewhere—however it was distributed—by cutting down some other rate. The probable quantity given was 11,600 yards; the difference, which may presumably be taken as the over-charge, between the sum tendered at and the departmental estimate, is 3s. a yard, making a total of £1,740; this sum, at least, must have been worked out of the tender by unduly lowering some other items. The reason for the manipulation was this—the number of yards of cement facing was calculated on the assumption that only the lower half of the sewers—oval in section—was to be plastered or “rendered.” This was really the intention of the department, and was carried out. But it was more or less of an innovation. Mr. Snodgrass assumed that, according to the former practice, the whole of the internal lining was to be rendered. He supposed a mistake had been made. To make a large profit on what he expected would be an increase of several thousands of yards of rendering, he risked the result of making a serious reduction in the price of some other work. He was disappointed—the upper part of the sewers was not rendered; and, some alterations having been made in the work, the number of yards to be paid for ran out at only 10,683; so that this instance of speculative tendering probably caused a substantial loss to the contractors.

But the most extraordinary feature of Carter, Gummow, & Co.’s tender for Contract 69 was item 36—squared bluestone pitchers; which are used to surround, protect, and keep the road level to the edge of, the covers of manholes closing shafts in streets. By one of those mistakes that experience shows will escape the most careful revision, in the column of “probable quantities” opposite this item, instead of 38 yards, which would have been about the proper number, 12 yards came to be printed. Having examined the plans and counted the number of shafts, and having found that they all, with one or two exceptions, showed a ring of bluestone pitchers, Mr. Snodgrass saw at once that a mistake had been made; and—presumably—cutting off an equivalent of about £585, by lowering some other items, to compensate for the difference between £600 and £15 (which would have been about a fair price for the 12 yards), he attached to this item the ridiculous sum of £50, hoping thereby to gain some £1,200 of illegitimate profit. The first question that arises is this: Was the error intentional—made for the purpose of playing into his hands? This question answers itself: every contractor with his eyes open would be expected to see the mistake as well as Mr. Snodgrass, and no officer would be likely to venture on such a palpable act of fraud. Curiously enough, the very simple explanation of this error—the source of the suggestion, if it was intentional; more probably the cause of the accident—was not discovered till near the close of the Commission; it was a transposition of the quantities for bluestone and sandstone pitchers; the former should have been thirty-eight, the latter twelve; as the work involving the sandstone pitchers was, for convenience, transferred to another contract, attention was never called to the thirty-eight as excessive; and so the clue to the error in the quantities for bluestone pitchers was lost. The fact that Mr. Snodgrass did discover it certainly does not leave it to be presumed that he had any information on the subject. The next question is this: Was the peculiar tendering discovered in time for the Chief Engineer to be apprised of it before the tender was accepted? In the multiplicity of tenders that he had to deal with he would not be likely to notice it. Mr. Bagge swore that he did call Mr. Hickson’s attention to it, and that Mr. Hickson said nothing could be done (Question 13110). Mr. Hickson denied this (Question 17143). Most of the surrounding circumstances negative Mr. Bagge’s statement; and his recollection on various other matters is so obviously at fault that, without imputing to him any wish to misrepresent facts, your Commissioner regrets to say that he cannot place much reliance on his accounts of matters that happened a few years ago. It is probable that in fact no one noticed the peculiarity in this item till Mr. Millner, early in May, 1894, discovered it in making out a progress voucher. He naturally thought pounds was a mistake for shillings in his copy of the schedule. Mr. Snodgrass assured him it was not so. The matter was referred to Mr. Davis, who had himself up to that time been misled by a mistake in his  
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copy, no doubt innocently made by a clerk, showing shillings instead of pounds ; the original document was referred to, and £50 was found to be correct. It was then that Mr. Davis's minute, which appears as No. 11 on page 111 of the Appendix, was written. Mr. Davis suggested the substitution of special bluestone concrete, for which the tendered price was fair (50s. per cubic yard)—at any rate for everything beyond the 12 yards appearing in the schedule of quantities. The matter was referred to Mr. Hickson. A discussion took place in the office, at which the contractors were present. Mr. Snodgrass has given the clearest account of this interview on page 693 of the evidence, Q. 20991. Mr. Hickson's opinion then formed was embodied in the minute which follows Mr. Davis's, expressing the opinion that the department could not in fairness omit an item for which the price was absurdly high, knowing that on other items the price was equally low ; and deciding that, where bluestone pitchers were shown on the drawings, the contractors must be paid for them. At the very conclusion of the evidence—page 721—Mr. Davis more clearly explained this matter of the omission from the plan of the pitchers on some shafts. Every shaft was supposed to be so finished ; but, by accident, the Prussian blue, indicating bluestone pitching, had been left out of the plan in some cases. This mistake—fairly set off against the mistake in numbers taken advantage of by Mr. Snodgrass—Mr. Hickson insisted on. Thirty-eight was the original number of yards intended. When Mr. Davis wrote his minute, this was reduced to about thirty-five by some of the shafts having, for convenience, been transferred to M'Sweeney's Contract 62. Afterwards some other changes were made, and supplementary drawings were sent down to the contractors. This was almost certainly after the work had passed out of Mr. Hickson's control. In these supplementary drawings the blue colour was put in, in ignorance of Mr. Hickson's limitation, where on the original plan it had been left out. Moreover, it seems that the pitching was again increased by one of the changes made ; therefore, in the end, although one shaft was left unpitched, because it was on vacant land, the number of yards actually paid for,  $36\frac{1}{2}$ , was about equal to the whole quantity (with the exception of one shaft) that was intended to appear on the original schedule, and Mr. Hickson's reservation, by means of all these various changes, seems to have been defeated. The question is, whether Mr. Hickson's action is evidence of favouritism. Under clause 16 of the "general conditions" of the contract (page 20 of the Appendix—these same general conditions being attached to Contract 69), it would appear that the Engineer has extensive powers of substitution ; but Mr. Hickson might well have had grave doubts on this point—whether the clause empowered him to substitute one material for another for the sake of choosing the cheaper according to schedule rates, the obvious intention of the clause being to enable the Engineer either to meet unexpected contingencies or to introduce improvements, or otherwise to vary the work for the purpose of more beneficially carrying it out ; such a thing as picking out cheap items on the schedule never having been contemplated, and being contrary to the spirit, if not outside the letter, of the clause. It was in this former aspect that Mr. Hickson, in whom a sense of justice appears to your Commissioner to constantly prevail over any inclination to take advantage of technicalities, seems to have viewed the question, though no doubt a regard for what he considered the legal construction was also present to his mind. In such a peculiar case as this, where advantage was taken by a tenderer of what was evidently a clerical error, and where no actual loss could fall on the contractor—in all fair intendment—by a refusal to add to the probable quantities of work to be done at an utterly ridiculous price, the legal effect of the clause, if it really did enable such a course to be pursued, might well be insisted on as fitting in with the justice of the case ; but it should not, your Commissioner thinks, be taken as a fair conclusion from Mr. Hickson's action that it was the result of undue bias ; he appears to have decided against the contractors as far as he really thought proper—and safe—when he refused to extend the right to supply the pitchers beyond the amount actually shown on the plan—which certainly formed a part of the contract. If, before the tender was accepted, the peculiarity had been discovered, then this other question would have arisen—would it have been proper to reject the tender or to call upon the contractors to amend it. The difficulty, as put by various witnesses—notably Mr. Chamier, on page 547 of the evidence—would have been where to draw the line, if once the real or apparent disproportion of prices in tenders had been taken as a ground of objection to them ; and, if amendments were allowed, how to avoid charges or suspicions

suspicious of tampering, and, generally, improper interference, favouritism, &c. At any rate, the balance of evidence is strongly in favour of the view that it has not been the practice—though Mr. Bagge said something of the kind had been done in Victoria—to depart from the simple rule of accepting the lowest tender, so long as the tenderer is otherwise eligible; the Department calling for tenders trusting to its own ability to get as near as possible to correctness in probable quantities, so as to leave as little scope as may be for gambling on the schedule. But it appears to have been this incident of the bluestone pitchers, added to the extensive speculation successfully indulged in on some of the excavation items of Contract 69, that induced Mr. Hickson, after much reflection and consultation, to adopt the present system of percentage tendering. This system was not in itself new—it had for some time been in use in the Water Branch of the Water and Sewerage Board, and in the Works Department in annual contracts for the supply of stores—but it had never, in Australia certainly, been adopted on general construction contracts until Mr. Hickson introduced it; and, whether or not its introduction was in effect an original idea on his part, it was clearly his act. The system is this: The Department prepares a schedule of all the heads of work to be done under a proposed contract. At first, probable quantities were given; now they are not. Opposite each item is set the best estimate of price per unit that the Department can arrive at; then the tenderer is asked to say at what rate, compared with these estimates, he will do the work, either at par or at so much per cent. above or below. Under this system no “schedule rigging” can take place; though, of course, it does not follow that a tenderer may not be actuated in his offer by a hope of increase or decrease in items that appear to him to be assessed relatively too high or too low by the Department. On the assumption that the Department makes the prices bear a proper proportion to one another, then the system seems to be as nearly perfect as it is possible for one to be contrived. And it cannot be doubted that this innovation was directed principally against those firms of contractors who were most expert in the art of “schedule-rigging”. It came into force some time in the year 1894. The firm of Carter, Gummow, & Co. had probably more, and more scientific, knowledge of sewer construction than any other firm of contractors in New South Wales, or, perhaps, in Australia. In the person of Mr. Snodgrass they possessed a partner most expert in arranging schedule prices. Their success in the art had been remarkable. Therefore, undoubtedly, during the time when Mr. Hickson’s son was in the employment of the firm, and before it was understood that he was to leave it, Mr. Hickson, by his action, and apparently on his own initiative, dealt the firm of Carter, Gummow, & Co. a severe blow, that deprived them largely of the benefit of their knowledge and experience in contending with other contractors, and finally, if Mr. Snodgrass is to be believed, induced him in disgust to leave the business of contracting in New South Wales.

Therefore, as to the first charge under the head of this contract, your Commissioner is of opinion that there was no such manipulation or other unfair action or favouritism on the part of Mr. Hickson, or other officers of the Department. The excavation quantities stood, in the final voucher, as nature had arranged them: it was no action—no manipulation—of the Department, but it was Mr. Snodgrass’s perception, that resulted in the coincidence of that arrangement with the contractors’ interest: Mr. Bagge was mainly responsible for the “probable quantities”: no one has suggested that he was in league with the contractors. It is quite beside the question how other tenders, necessarily not accepted, might have worked out.

2. *With allowing the contract to be taken up by Carter, Gummow, & Co. with an insufficient bond, and by ultimately breaking that bond by remitting the retention money, and writing a minute by which the Minister was deceived and induced to consent.*

Now, the very first contract I turn up here, although the specification provides for a cash deposit to be put down, on the Secretary for Public Works’ authority they are allowed to substitute two sureties of a very doubtful nature. One of the sureties is a supplier of cement and the other is a supplier of iron. By an act of the Minister’s, he actually cancels this particular bond, which these two people sign. He does this by returning the retention money, and thus breaks the contract.—*Hansard*, 12th May, 1896.

Now I come to the contracts, and I am going to ask the hon. gentleman who administers the Public Works Department whether he was aware, when he signed remission of refund of money, that he was breaking a surety bond? Does he know that when he agrees to the contractor’s having back his surety funds, he is breaking the surety bond, and so letting the surety go free? I want to show the hon. member, if he never took the trouble to look into it, how he stands in this matter. Now, in the conditions of contract, in page 119, there is a paragraph which says:

“Progress payments may be made once in every month, unless the same shall become not payable by reason of anything contained in these conditions, on the certificate of the engineer, as the work proceeds, in the proportion of 80 per cent. of the value of the work returned, until the sum retained reaches the amount of the deposit provided, for in the preceding clause, when no further deductions will be made. The amount of the retention money will be held by the



Minister, in addition to the cash security, unless otherwise provided for in the specification, until the engineer has certified that the whole of the works have been satisfactorily completed, and the period specified for the maintenance of the said works has expired."

That is three months. In connection with this contract, it was provided in specifications that the contractors should put down £4,000 security bond, in order that, if at the conclusion of the work it was found to be defective, or if there was any roguery, this £4,000 would pay for it. On the engineer's advice, the Secretary for Public Works substituted two surety bondsmen, namely, Mr. Scrutton, who supplied the iron to these contractors, and Mr. Henty, who supplied the cement. As we go further on we find a minute in which the Minister is advised to return the retention money, on the security of these two individuals—not specifying the individuals, but specifying the firms. On page 127, the minute says this in reference to the application of Messrs. Carter, Gummow, & Co. for the return of their retention money.

"Having now completed a considerable portion of the above contract, for the performance of which your department hold security to the extent of about £6,800, being £4,500 as guaranteed by our sureties and £2,300 retention money for work already done, we have the honor to ask you to allow the payment to us of £1,000 from the latter amount, leaving £5,800 still remaining as security for the due fulfilment of the remaining portion of the work."

The minute goes on to say that the Minister has these firms as sureties while he had only the individuals. The Minister thereupon agreed to the return of the retention money.

Mr. YOUNG : It is only fair to read the whole of the letter !

Mr. PARKES :

"We would remind you that our sureties are two of the most reliable firms in the city, namely, Parbury, Henty, & Co., Pitt-street, and R. L. Scrutton & Co., Clarence-street, and also that the amount of security required, had the contract been accepted in the ordinary way, would not have exceeded £4,500."

Mr. YOUNG : Read the minute upon that !

Mr. PARKES : That does not affect the question. The officers deceived the Minister by stating that they have the firms Scrutton & Co., and Parbury, Henty, & Co., when they have only the individuals.

"Personal security has been given on this contract for double the usual amount of cash security ; so that, in addition to the retention money, which amounts to nearly £2,300, the department has security for £4,520, making a total of personal and cash security for the due performance of the contract of £6,820. The amount of the contract is £45,207, of which there has been about £30,000 worth of work done. This being the case, and the personal security being Messrs. Henty & Co. and Mr. R. L. Scrutton (firms, I suppose, which are safe), I think £1,000 of the retention money might be returned.—J.D., 21/9/94. Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage. Recommended.—R.H., 21/9/94. Under Secretary. For approval.—J.B., 21/9/94. Approved.—J.H.Y., 21/9/94."

The effect of the hon. gentleman's giving back the retention money made the agreement with Scrutton and Henty null and void, because part of the hon. gentleman's agreement with them was that he should keep the retention money until three months' maintenance from completion of contract.

Mr. COPELAND : In the interests of the country !

Mr. PARKES : Quite so ; but it appears to have been given up in the interest of the contractors. The hon. gentleman then had no hold upon them.—*Hansard*, 12th May, 1896.

\* \* \* \* \*

4. *With advancing to the contractors sums of money improperly and in violation of the terms of the contract, and without sufficient security.*

5. *With incompetency in carrying out and administering the contract.*

6. *With failing to comply with the orders of Parliament, and placing documents on the Table of the House in a manner calculated to mislead Honorable Members of the Assembly.*

I am going to make a charge against the hon. gentleman's department of deliberately attempting to deceive this House in connection with this document. The hon. gentleman should have examined this document. Does he know that it includes 180 useless printed forms? The hon. Member has placed on the Table of the House 180 sheets of printed tender forms, and has asked the House to incur the cost of printing them.

Mr. YOUNG : If I had kept any of them back the hon. member would have blamed me for that !

Mr. PARKES : But there was no need for the hon. gentleman to insert practically blank sheets that do not bear on the document at all, whilst the officers of the department cleverly abstracted three sheets of schedule prices and comparisons, and in their stead filled this document with blank forms and plans not connected with this matter—in one case numbering sixty-four, in another twenty-seven, and in another thirty, and so on, making 180 altogether. Does the hon. member know that every important minute bearing on an important matter in connection with this case has been abstracted? Does he know that that information which the House ordered to be printed, and which would not have been half as bulky, has been withdrawn, and rubbish put in its place?

Mr. YOUNG : I am sure it has not?

Mr. PARKES : Well, look at the document—it proves that itself. Does the hon. gentleman know that, where plans are moved for in connection with contracts, they are abstracted, and the plans of neighbouring jobs, which are not even going on, are put in? What is the good of saying "Nonsense"? The plan of Contract 69 was moved for ; but the plan of a sewer in Canterbury, which is not even in course of construction, is put in, and the other is abstracted. It is no good saying "Nonsense"—there are the papers.

Mr. YOUNG : As a matter of fact, the hon. member did not move for plans at all !

Mr. PARKES : My motion was for

"copies of all papers and correspondence in connection with the contracts of Messrs. Carter, Gummow, & Co. at Marrickville, Balmain, North Sydney, Johnstone's Creek, and Stanmore, including the specification, schedule, &c., for original contracts, and for substituted ones, and all vouchers paid, and details of same, and such other matter included in the transactions from commencement to the present date."

What does that cover? I am told on very good authority that while the public works officers were compiling this document, the utmost hilarity was taking place, and the one most facetious was Mr. Joseph Barling, the Under Secretary for Public Works, as regards the manner in which these documents were to be placed before the House. There has been the most glaring attempt to deceive the House. The object was to have a mass of documents which no one would look through, and which would be cast aside. If these documents had been prepared in a proper form, instead of costing £500 they would have cost, I suppose, only about £250. Let me show hon. members what is omitted, in order to show the reason for the omission. In connection with Contract 69, sixty pages of blank tender forms, which might have been omitted, are put in ; but the sheets of tenders and estimates are withdrawn, and wrong plans are put in.—*Hansard*, 12th May, 1896.

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7. *With allowing defective work to be put in the works, by which a loss is sustained by the Crown.*

I will prove that the most defective work has taken place upon this job.—*Hansard*, 12th May, 1896.

2. The second charge first alleges that an insufficient bond was taken. There is really no evidence in support of this ; and your Commissioner can see no substantial ground for the charge. Mr. C. J. Henty and Mr. F. Lassetter were the bondsmen named in the first place. In consequence of Mr. Lassetter's departure for England, Mr. J. Leneve Scrutton was nominated and accepted in his place. The acceptance

acceptance of sureties in lieu of cash deposit was adopted in many other contracts let about the same time, in consideration of the contractors' agreeing to be paid in Funded Stock instead of cash—a very fair arrangement. Secondly, it is alleged that the bond was broken by a remission of the retention money. The contract was accepted on 27th December, 1893. The history of this affair is shortly told in the following correspondence:—

Messrs. Carter, Gummow, & Co. to The Engineer-in-Chief for Sewerage.  
Contract No. 69, Western Suburbs Sewerage.

Sir,

North Sydney, 20 September, 1894.

Having now completed a considerable portion of the above contract, for the performance of which your Department hold security to the extent of about £6,800, being £4,500 as guaranteed by our sureties, and £2,300 retention money for work already done, we have the honor to ask you to allow the payment to us of £1,000 from the latter amount, leaving £5,800 still remaining as security for the due fulfilment of the remaining portion of the work.

We would remind you that our sureties are two of the most reliable firms in the city, viz., Parbury, Henty, & Co., Pitt-street, and R. L. Scrutton & Co., Clarence-street; and also that the amount of security required, had the contract been accepted in the ordinary way, would not have exceeded £4,500.

We have, &c.,

CARTER, GUMMOW, & CO.

Personal security has been given on this contract for double the usual amount of cash security; so that, in addition to the retention money, which amounts to nearly £2,300, the Department has security for £4,520, making a total of personal and cash security for the due performance of the contract of £6,820. The amount of the contract is £45,207, of which there has been about £30,000 worth of work done. This being the case, and the personal security being Messrs. Henty & Co. and Mr. R. L. Scrutton (firms, I suppose, which are safe), I think £1,000 of the retention money might be returned.—J.D., 21/9/94, Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage.

Recommended.—R.H., 21/9/94. Under Secretary. For approval.—J.B., 21/9/94. Approved.—J.H.Y., 21/9/94. Mr. Millner to include in next progress return.—J.D., 21/9/94. Included.—W.J.M., 24/9/94. Accountant.—J.D., 26/9/94. Voted.—O.C. (*per* E.H.), 2/10/94. Mr. Piper.

From this it would appear that the release, in September, 1894, of the sum of £1,000, part of the retention money, was just such an ordinary act of grace as any contractor might ask for, any officer might recommend, and any Minister might sanction. The papers in this matter appear on page 12 of Appendix as No. 18. Whether the sureties could in law have claimed that such a waiver of the strict rights of the department under clause 30 of the "General Conditions" (page 22 of Appendix) had the effect of releasing them seems to be immaterial, in the face of clause 27, which, perhaps not to the mind of a lawyer, but certainly to that of a layman, would convey the impression that no danger could result from this payment, and clause 34, the last two lines of which clearly contemplated advances from retention money: but it appears to your Commissioner that the point did not occur to any person concerned in the transaction; if it had, the sureties would have been communicated with as a matter of course, and would, of course, have assented, as was done when, on 6th July, 1894—Appendix, page 12 (No. 14)—the right to pay either in cash or in Funded Stock was given to the department in lieu of the rigid condition for payment only in the latter form, and the sureties were naturally asked to join in this radical variation in the agreement. The minute "by which the Minister was deceived and induced to consent" was Mr. Davis' minute. How the Minister could be deceived your Commissioner is at a loss to imagine.

One argument that barely deserves mention, much less discussion, relied upon to show a want of good faith in Carter, Gummow, & Co., and also in Mr. Davis, and, through him, in Mr. Hickson, was the use by the contractors of the expression "Parbury, Henty, & Co.," and "R. L. Scrutton & Co.," and Mr. Davis's allusion to "firms, I suppose, which are safe," whereas the individuals, and not the firms, were the bondsmen.

The next charge,—“Paying to the contractors large sums of money which they (the Government officers) were not compelled to pay under Carter, Gummow, and Co.'s contract with the Crown,” so far as it alludes to the peculiarity of the Schedule, has already been dealt with. So far as it may be taken to refer to some filling, as to which a concession was made in consideration of the contractors' agreeing to the substitution of one sewer for two, involving a reduction of work, a substantial saving of expense in Contract 69, and a much larger future saving, your Commissioner has gone carefully into this matter, the details of which need not be set out here, and is satisfied of the absolute *bona fides* and fairness of the whole transaction. The papers fully explaining this matter appear in the Appendix, pages 113 to 118; at the head of page 117 is to be found the minute which mentions the filling.

4. The charge of advancing sums of money has already been dealt with in relation to the retention money; there appears to be nothing peculiar in the amount of advances on cement, only extending to £450 at any one time. As appears in Mr. Christie's evidence, page 382, a memorandum was signed for an advance of £1,000; the minute and memorandum appear on page 76 of the papers laid before Parliament, in compliance with order of 10th October, 1895, thus:—

*Minute-paper.*

*Subject:—*Advance on Cement Contract, No. 69, Sydney Sewerage.

Department of Public Works, Bonds and Contract Branch, Sydney, 29 March, 1894.

THE memorandum herein, duly prepared, has been executed by the contractors, Messrs. Carter, Gummow, & Co., and stamped, and might now be forwarded to the Commissioner and Engineer-in-Chief for Roads and Bridges and Sewerage.

The other papers herein are with Sewerage.

The Under Secretary.

HAROLD F. NORRIE,  
Officer-in-charge.

Roads.—D.C.M'L. (for U.S.), B.C., 21/3/94. Mr. Davis. Scen.—J.D., 30/3/94.

"A."

MEMORANDUM.

IN consideration of the Minister for Public Works, in and for the Colony of New South Wales, advancing to us the sum of £1,000, and of any future advances to be made to us, we hereby agree to repay to the said Minister for Public Works the said sum of £1,000, and future advances, together with interest at the rate of £6 per centum per annum on such sums respectively from the date of advance, on demand, and we hereby charge all moneys due or payable, or becoming due or payable, to us under a certain contract for the construction of the Eastern Main Branch Sewer, Western Suburbs Drainage, Contract No. 69, Sydney Sewerage Works, in the said Colony, entered into by us with the Government of the said Colony; also all cement, building materials, and every other thing already used, or to be used, in connection with our said contract; with the repayment of the said sum of £1,000, and any future advances, and interest at the rate aforesaid; and we hereby undertake to give, whenever called upon to do so, a valid bill of sale to the said Minister for Public Works over the said cement, building materials, and every other thing used in connection with our said contract, now stored in our premises at Illawarra Road, Marrickville, in the said Colony, or elsewhere, such bill of sale to contain a power of sale, and such other powers, provisos, and agreements, as the said Minister for Public Works may be advised. Also further undertake to give immediate possession of same to the said Minister, or any person appointed by him for that purpose, whenever called upon to do so.

As witness our hands, at Sydney, this 27th day of March, A.D. 1894.

Witnesses to the signatures of John Carter, Frank }  
Moorhouse Gummow, and David Graham }  
Snodgrass,—

JOHN CARTER.  
F. M. GUMMOW  
(By his attorney, J. CARTER).  
D. G. SNODGRASS.

HAROLD F. NORRIE, J.P.  
JOSHUA J. FARR, J.P.

Witness to the signatures of Peter Ewing and }  
George Maddison,—

GEORGE MADDISON.  
PETER EWING.

J. T. WARLOW DAVIES.

This is memorandum marked "A," referred to in the annexed declaration of John Carter, made before me this 29th day of March, A.D. 1894.

HAROLD F. NORRIE, J.P.

Under the head of Contract 79 the whole question of advances on material is fully dealt with.

5. Your Commissioner can see no evidence to support the charge of incompetency.

6. The matter involved in this charge,—in failing to comply with the orders of Parliament, &c., have been explained—notably by the evidence of Mr. Barling, on p. 202 of the evidence, questions 7432–5, and by Mr. Davis and Mr. Hungerford, who also gave evidence on this question; Mr. Barling, when called the second time, spoke further on the same subject—p. 443. As to Mr. Hickson, he had nothing to do with the matter; the officers engaged in it used their utmost diligence and exercised their discretion to the best of their ability—not their discretion as to how far they would carry out the order, but as to what the order meant; your Commissioner is satisfied that they acted honestly and properly; and, if some papers that ought to have appeared were omitted, such omission was due to accident—was certainly not intentional. The omitted papers appear in Memo. 13 by Mr. Christie, on page 380 of the evidence. The earlier of those which bear a date preceding the order of Parliament deal with a matter which occurred before tenders were received; the  
later

later were written after Mr. Hickson had given up charge of the works; no motive for Mr. Hickson's withholding these particular papers could reasonably be suggested; no doubt the various changes made in administration and location of office account for their omission.

7. The last charge under the head of this contract—"allowing defective work to be put in the works"—will, so far as the question of shortage of cement is concerned, be found dealt with under the head of Contract 79A. The direct evidence of defective work—outside of the question of cement on this contract—was, first, that of Benson, p. 3 of the evidence, satisfactorily explained by Husband on p. 554; Dawson's evidence on p. 2, as to packing a tunnel with shale, having absolutely nothing in it; it was afterwards fully explained that this work was properly done, and led, compared with concrete packing, to a large saving of expense to the country. Then there is the evidence of Darcus, p. 63, Question 2183, &c., explained by Mr. Griffiths on p. 535—an exaggeration of a trifling error in the laying out of a penstock chamber, the sides of which were placed perpendicular to the axis of the outlet siphon pipe, instead of to that of the sewer; the angle—of only forty-four minutes, in a horizontal plane—between the axes had to be transferred from the junction of the siphon and the chamber, where it was to be, to the sewer, causing an almost imperceptible bend. The incident was absolutely immaterial; the mistake was, under the circumstances, excusable; but the exaggeration apparent in Darcus' story is important, because it discounts largely either his intelligence or his credibility as a witness, insomuch as to make his vague accounts of sundry acts of misconduct on the part of the contractors of no substantial value. The general question of shortage of cement applying to all the contracts later than Contract 72 will be found dealt with under the head of Contract 79A. But, assuming for the sake of argument that some work, defective for want of the use of a due proportion of cement, has been done on Contract 69, your Commissioner can see no evidence that it has been in any sense allowed by Mr. Hickson or any other responsible officer of the department. On the contrary, your Commissioner is convinced that every reasonable effort has been made by all these officers to secure the very best class of work. The papers printed as Appendix No. 61, p. 108, show the remarkable care taken by Mr. Davis to secure economy, combined with efficiency, in the construction.

### CONTRACT 72 (SHEA'S CREEK).

1. *With paying away large sums of money to the contractors, Carter, Gummow, & Co., which they (the departmental officers) were not obliged to do under the contract conditions; and with settling a claim without a proper test as to the liability of the Crown for a sum of £4,050 9s. 6d. by obtaining the Minister's consent granting the contractors Contract 79 without retendering for that contract, when, in the interest of the Crown, it was the clear duty of the department to do so.*

In Contract 72, in which there are no particulars shown, a claim was made by the contractors for something like £4,000. In this contract we have simply the papers given to us—the specification and the payments. But in the schedule there is provision made for the excavation, which is to be done according to the schedule of the contractor, which he undertakes to carry out, and it shows that he has a contract to excavate 26,200 cubic yards, and 12,000 cubic yards of filling. When we come to the payments we find that the contractor, instead of being paid for 26,000 yards of excavation, is paid for 53,000 yards of excavation at 2s. 6d. Then instead of being paid for 12,000 yards of filling he is paid for 27,000 yards of filling or something more. Now there are no papers whatever to show why this extra is paid, nor is there any paper to show why another claim of £4,000 is granted in addition later on. But I was told by a member of this firm who has left it that the Government stopped this work to get possession of some land, or for some purpose, and although there is a provision in the contract which throws the whole obligation on the shoulders of the contractors for all these delays, that while the work was stopped there came a very heavy flood and it washed out their works to double the extent to which they had been carried on, and I was told, and I believe it to be true owing to the authority from which it comes, that the Government officer has not only paid them for the work they did, but paid them for all the flood-water washed out, and then paid them to fill it up again.

Mr. YOUNG: What contract is that?

Mr. PARKES: That is Contract No. 72. There is just another little item to which I will refer to show how these things are manipulated. There is one item of wrought-iron girders. The trade price for wrought-iron girders placed in position is from 11s. to 13s. per cwt. A few years ago the price was 13s. a cwt., but it is 11s. at present. In the schedule provided by the contract the Government are to get a certain quantity—that is 74 cwt. The contractors give the price at 25s. per cwt., that is 100 per cent. over the proper value. Without rhyme or reason the quantity is increased from 74 cwt. to 400 cwt., and they pay for that at 25s. per cwt. That is, the contractors are given a neat little sum of £280. Every effort has been used in the settlement to give Carter, Gummow, & Co. an advantage over the Government.—*Hansard*, 12th May, 1896.

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These contractors were not the lowest tenderers, by a long way. A firm of contractors named Bond and Hudson sent in a tender to do the work for £3,000 less than the contract of Messrs. Carter and Gummow. I will show how cleverly the department acted in getting rid of Messrs. Bond and Hudson's contract. The minutes bear out everything I say. Messrs. Bond and Hudson's tender was accepted by the Board of Reference; but Messrs. Bond and Hudson were not notified of that for three months. They then wrote to the department, and asked if their deposit money might be returned. One of the conditions is that the contractors' money shall not be returned if they fail to take up their contract. But in this case Bond and Hudson's cheque was returned, in order that they might be got out of the way. Instead of having tenders called for, the Engineer-in-Chief said—Messrs. Carter and Gummow having a claim for £4,000 on Contract 72, he recommends them to forego this claim, and says they can have a preference to the amount of £3,000 over the other contractors. That is a cool way of settling a claim, and the beauty of it is that the claim has never been tested by the law authorities. It was the duty of the Government officers to see whether it existed—whether there was a claim at all; but  
the

the claim was admitted, and Messrs. Carter and Gummow received the preference over other contractors if they would forego their claim, as to which one of the late partners told me they had not a shadow of a leg to stand upon. Their own solicitor told them that; but this claim was accepted as being correct, and the claim was put in when No. 72 was only half finished, and not a month before they received the preference in regard to the other job. There cannot be the slightest doubt that, if the work had been tendered for, it could have been let 30 per cent. cheaper.

Mr. COPELAND: What was the amount of the contract?

Mr. PARKES: It was £35,000 when it started, and it was increased to about £45,000, I believe.

Mr. COPELAND: Were they the lowest tenderers?

Mr. PARKES: No. Messrs. Bond and Hudson were the lowest tenderers. I am now speaking of Contract No. 79.—*Hansard*, 12th May, 1896.

2. *With proceeding with works not contained in the contract, and paying for same out of contract vote; and with using unauthorised, in connection with contract, money voted for other contracts.*
3. *With withholding from the papers laid upon the Table of the House such documents as would allow Honorable Members of Parliament to understand the nature of the contract, and the manner in which it was carried out.*

In connection with Contract 72, a list of other contractors' tenders and schedule have been omitted; all plans, correspondence, and minutes have been omitted; correspondence regarding a claim of £2,000 has been omitted, in fact every paper of importance has been omitted.—*Hansard*, 12th May, 1896.

The history of this contract, which dates back to early in 1891, has been somewhat difficult to trace: but the recollection of witnesses, imperfect when first endeavouring to recall the facts, became gradually clearer as the surrounding circumstances were presented to them: and your Commissioner has arrived at what seems to be the true account of the matter. It is shortly this: In 1889 Shea's Creek "ship-canal" was in course of excavation, the work proceeding from south to north. On April 30 of that year an injunction was granted by the Supreme Court against the Minister for Works, at the suit of one Macnamara, who had wool-scouring works on the margin of the swamp, restraining the department from continuing the excavation past a certain line running south-east and north-west, by reason of the risk of draining his dam. This injunction stood till March 20, 1894, when it was dissolved by consent, on the terms that Macnamara should receive compensation for any damage done to him by the works at Shea's Creek previous to March 4, 1894, the date of resumption of certain land by the Crown, the damage to be assessed by a jury. Meanwhile, about 1890, the necessity for extending a system of storm-water sewer construction through Alexandria became increasingly urgent. It was out of the question to attempt to begin the building of an underground system of sewerage in this low-lying locality; but storm-water sewers, which such a system would not eventually supersede, were absolutely necessary to carry off quickly the foul surface drainage for which the tortuous natural channels, with barely any fall, only acted as fever-breeding receptacles. Typhoid was increasing at an alarming rate. A sum of £8,000 was voted for the sewer constructed by Parry and Farley under Contract 75, running from north to south from Swanson-street to near Macdonald-street, and passing through Macdonaldtown Park. About the time the plans for this contract were being prepared, plans were also drawn for another sewer, to begin at Munni-street, and to run generally E.S.E. till it met the gutter known as Macdonaldtown Creek, close to the east of Contract 75, then to continue in a S.S.E. direction along the general course of that creek till it found an exit in the proposed Shea's Creek Canal, at a point about 32 chains above (N.N.E. of) the injunction line. A sum of £15,500 was voted for this work, known as Contract 72.

It was ascertained that there would be a balance left of the £8,000 vote for Contract 75, amounting to about £2,000, when that work was completed. As one contract was practically an extension of the other, this balance might legitimately be added to the £15,500 and applied to Contract 72. The sum available for No. 72 would, therefore, be about £17,500. But, when the quantities came to be taken out, it was found that, in the then state of the market, prices being high, it was not likely that a tender would be secured for so low a price as even £17,500. Under these circumstances, arrangements were made for reducing the cost of the work, without completely spoiling it. From a point about 27 chains from the proposed outlet in the canal (to be constructed) the sewer was designed as an open channel, lined with concrete. From this point downwards this channel would become a substitute for Macdonaldtown Creek. At another point, 14 chains further south, and therefore 13 chains from the outlet, Macdonaldtown Creek and the course of the open concrete channel began to part company, the creek eventually turning off to west of south. In order to reduce the cost of the work by either of two different and substantial sums, it was proposed to construct the upper part of it, if necessary, only as far down as the point 27 chains from the outlet at the canal, leaving the  
open

open channel out altogether, or, if again suitable to the conditions of tender and money available, to construct that channel only to the lower point, 13 chains from such outlet. It was then thought—a surveyor having been sent out to examine the ground for the purpose, and having reported favourably—that Macdonaldtown Creek would form a sufficient temporary outlet for the sewer from either of these two points. All this time the officers of the Sewerage Construction Branch of the department were hoping and expecting that the injunction would be dissolved, and that the work of excavating the ship-canal would be pushed forward, so as to be in time for the canal to form an outlet for the concrete channel, the level, as it stood, of the swamp through which the canal was to be cut being too high for that purpose. But, when it was determined to call for tenders for Contract 72, the injunction was still standing; consequently there was seen to be no chance of finding an outlet at the extreme south end of the proposed concrete channel: either one of the two schemes for shortening the work must be adopted, or an outlet must be somehow provided in the swamp. With this object a survey was made, and a plan was drawn with cross and longitudinal sections, and added to the original site-plan of Contract 72, showing an earth channel, to be excavated to the depth of the concrete channel, and of sufficient width, along the centre line of the proposed ship-canal. And, when it was determined to go on with the work, instead of a resumption being made for the purpose, arrangements were come to with Mr. Hill, agent for Mr. Cooper; owner of the land (to whom Macnamara was tenant), who agreed to the cutting of the earth channel, but insisted upon the concrete channel's being covered where it passes through a sand ridge between Macdonaldtown Creek and the swamp; on the making of a flume just to the south of the sand ridge, to carry across the concrete channel the water of a sort of old water-race that has been misnamed Shea's Creek; and the providing, at a point where Macdonaldtown Creek and the concrete channel leave one another, of an outflow and stop boards, to be used, if required, for the purpose of throwing the discharge of the channel into the creek, and so supplying Macnamara's dam, into which the creek water finally flows, with storm-water that the earth channel would otherwise carry off. It is to be observed that all these works—which would probably cost the country less than compensation on resumption—made additions to the original quantities, which were taken out on the basis of an open concrete channel through the sand ridge, discharging into the ship-canal. It would appear that, before these additions were made, the contract and specification had been prepared, with the quantities. Whether the specification from the first contained the clause No. 3 (*Appendix 76*, page 151), providing for the possible omission of the 13 or 27 chains, is not very clear. On the form of the specification, however, it would seem that it did originally contain this proviso, as the numbering of the clauses runs on consecutively; clause 3 containing this, and only this, peculiar condition: while the only clause to be found, either in the contract or the specification, dealing with, or in any way introducing, the earth channel, is the second part of No. 39 (*Appendix 76*, page 153), and seems, from the way in which it is inserted into that clause, to have certainly been added after the drafting of the specification. It would therefore appear that, as narrated by Mr. Davis, the idea of making the condition for excision of part of the work was earlier than the discovery of the necessity for providing the earth channel: yet clearly the making of that channel was part of the work contracted for, if required.

But, beyond all doubt, from first to last, the probable quantities were never altered to include any of the extra works, though these amounted to a very large addition, both in the excavation of the earth channel and in the building of the brick jack-arches on iron girders covering the concrete channel under the sand ridge. Naturally, your Commissioner sought an explanation of this. The explanation given, though more as a surmise than as a fact in any person's recollection, was this:—That, considering that the department had estimated the whole work at about £20,000, and that only, at the most, some £17,500 would be available, the chance of securing a tender that would enable the work to be carried out in its entirety was so remote that it was not thought worth while to alter the quantities; as the tender was to be at schedule rates, it was thought of no consequence even if eventually, but contrary to all expectation, these quantities should be much increased by the carrying out of work that seemed certain to be omitted. Unfortunately, Mr. Bagge—the witness who might have thrown light on the subject, as these matters were peculiarly within his knowledge—began by showing, when asked about Contract 72, such a

lamentable

lamentable want of recollection—or, rather, such an inverted memory—of the whole affair that it was evidently useless to press him further. Certainly, in your Commissioner's opinion, the omission to alter the quantities to fit the altered conditions was a very unwise and irregular proceeding; but, considering his duties in relation to the matter, it would not be likely that Mr. Hickson would have any personal knowledge of this—as it would seem to be—failure of duty on the part of some subordinate officer. The omission was a serious one, as it might have led to a mistake on the part of a tenderer who was not careful to take out his own quantities. He would see the plans, of course, and he ought to notice such an incongruity as a deficiency of 27,000 yards of excavation; but still—in fact, Mr. Carter said he thought Mr. Snodgrass, tendering rather carelessly, had been so misled—a tenderer might have assumed that the quantities were correct, and so have named a higher price per yard than that which he would have asked for a larger quantity.

When tenders were invited the lowest turned out to be Carter & Co.'s, for £20,650 on the quantities shown. Of course, the sum total of tender would work out very much higher on the quantities that ought to have been shown. When, however, the tenders came before the Under Secretary, Mr. Barling, a new difficulty was apparent. The amount was in excess of the limit provided by the Public Works Act. The work was very urgently required. Mr. Barling referred the matter to Mr. Hickson, asking if any reduction could be made. The answer was "Yes; about £3,000." The Minister minuted the paper "Reduce accordingly." The ready way in which Mr. Hickson's answer was given confirms Mr. Davis's account of the preparation which had been made for the emergency, namely, a deficiency of money to carry out the whole scheme.

When, however, the work came to be started, it seems peculiar that the very first thing done was to prepare for the excavation of the earth channel. The journal of the contract shows this: and there appears in it no explanation of how it was that, there being clearly—not by £3,000, but in fact by about £7,000—a deficiency in the amount of money available to complete the work from the injunction line to Munni-street, and the reduction appropriate to such deficiency having been provided for, an inconsistent course should have been at once adopted. Mr. Davis's explanation is this:—although it had been reported by the surveyor, who had formerly been sent out to examine Macdonaldtown Creek, that it would form a sufficient exit at either of the suggested points, yet, as soon as Mr. Davis went to see about starting the work, he discovered that a mistake had been made, and that the level of the bottom of that ditch—as it really is—was too high by some feet to make a proper exit: if it had been utilised at all, it would have had to be deepened for a long distance down—the fall of the ground being very slight: this work would, when—in the future—the concrete-channel came to be completed up to Shea's Creek, be all wasted: therefore, unquestionably, if the work was to be done at all—and the tender had been accepted—the only practicable, and, in the end, economical, way was to begin from the injunction line, to work up as far as possible—as long as funds held out—and then to take advantage of the general power in the contract—under the last words of clause 3 of the specification, and the last paragraph of clause 4 of the general conditions—enabling the department to cut off some of the upper part of the work. Of course, as soon as it was decided that Macdonaldtown Creek was not an outlet, and therefore that the outlet must be through the injunction line, it became necessary to begin the work from that point; the levels absolutely prevented any other course. In such a flat piece of country, sewer work must be begun at the outlet, to avoid flooding. In justice to the surveyor, who appears to have made a mistake as to the relative level of the bottom of Macdonaldtown Creek and the sewer, it is fair to mention the fact that Mr. Snodgrass, in his evidence, said that he considered that the contractors had been allowed, by some thousands of cubic yards, short measurements in the excavation in the line of the creek, because the department had paid them on the old cross-sections, which had altered much by siltage since they had been taken. If this is correct, then the same siltage may account for Mr. Davis's finding the creek-bed higher than the surveyor had placed it: heavy rains cause very sudden changes in such sandy country as that about Alexandria, especially when it is being disturbed in various ways by extending settlement.

Work started on Contract 72 on March 10, 1891. By October in the same year it became apparent that there would not be money enough to complete the scheme:



scheme: Mr. Hickson wrote to the contractors a letter (*Appendix* No. 34, p. 68), stopping the work at a convenient point—the junction with the Macdonaldtown Park storm-water sewer. He relied ostensibly on clause 3 of the specification. In applying the funds available to the portion actually carried out up to this stoppage, the department had certainly succeeded in doing the most serviceable work: the part left out was a distinct section of the scheme; and the part completed was a satisfactory and complete job in itself.

After the stoppage, no work went on on the contract, except so much as was required to finish the part which the contractors were allowed to complete. The last certificate was dated January 20, 1892. Mr. Abbott, M.P., Mr. Molesworth, M.P., and the Macdonaldtown Council, were urging the Minister for Works—then Mr. Lyne—to continue the sewer; on March 23, Mr. Barling informed Mr. Abbott that the sum required would be placed on the Estimates, but that Mr. Lyne desired him to say that he would not be able to deal with the matter till they were passed, which would, the writer presumed, be in a short time; and to a request from the Macdonaldtown Council that a deputation might be received to speak on the subject of the stoppage of the Munni-street sewer the reply was given that there was no need for it; that as soon as the additional money required was voted the work would be proceeded with: from which it clearly appears that the department was aware of the intention of the Government to get the necessary money, if possible, and to continue the work as soon as practicable. The Loan Act passed the Assembly on March 24. On April 5, Mr. Hickson recommended that Carter & Co. should be allowed to finish their contract. They did so, and completed it. The work, therefore, in as far as a substantial continuation of the contract was concerned, was suspended for about six months. Up to the latter part of February it stood in the position of being either discontinued altogether or hung up for an indefinite, but probably not a very long, time. Thenceforth it was almost a matter of certainty that the stoppage would be only temporary.

Meanwhile, in May, 1891, tenders had been called for Contract 79, a large and expensive work of sewer construction at the North Shore. Seven tenders were received, of which the lowest, at £36,900, was that of Bond and Hudson; the next was Carter & Co.'s, £39,890; Gummow and Gillan's came next, at £40,840. The extraordinary disparity of tenders, and therefore of estimates, for the same work, is exemplified by the fact that the highest tender was at £58,011, bearing the proportion to the lowest of 1.57 to 1; and the average amount of the tenders would imply that Bond and Hudson were offering to do the work at a dangerously low rate. These tenders were received on June 10, 1891. On the same day Mr. Hickson recommended acceptance of Bond and Hudson's tender. They were not, however, notified of the acceptance, because of the condition of the public finances, which made it clearly inexpedient to go on then with so large a work. On 10th June the following letter was received by the President of the Tender Board, Mr. Hickson, from Carter & Co. and Gummow and Gillan, who, up to that time, had been adversely competing contractors, each firm regarding the other as its most powerful opponent:—

Sir,

Sydney, 10 June, 1891.

We have the honor to enter our protests against the acceptance of the tender of Messrs. Bond and Hudson for Contract No. 79, North Shore sewerage, on the following grounds:—

1. That the tender of Messrs. Bond and Hudson for Contract No. 56, Potts' Point sewerage, was accepted by your Board and not taken up by them.

2. Upon fresh tenders being called, the tender of Mr. G. E. Hudson was the lowest, but was not accepted by the Board, in accordance with their rules and regulations.

Upon these grounds we, as tenderers for the North Shore sewerage, beg to protest against the tender of Messrs. Bond and Hudson being now accepted.

We have, &c.,

GUMMOW AND GILLAN.  
CARTER & CO.

Let me have papers *re* Bond and Hudson's tender for Contract 56.—R.H., 10/6/91. Here-with.—J.C.P., 10/6/91. Mr. Hickson for report.—J.B., 10/6/91.

In January, 1890, C. S. Bond (afterwards Bond and Hudson) tendered for sewerage contract No. 56, at a ridiculously low figure, and, as anticipated, had to throw up the contract and forfeit deposit. They were the lowest again when fresh tenders were invited, but did not get the work, they being ineligible under the Tender Board Regulations, clause 14. The same firm now (some sixteen months later) are the lowest tenderers for sewerage contract 79, and it is contended by the writers of the within letter that their tender should not be accepted. I cannot recommend that this course be taken. It is true, under clause 14, they can be excluded from competing for other works at the pleasure of the President. But in all fairness there must be some limit (when no fraudulent action has taken place) to this prohibition; and it seems to me, after sixteen months, all bar to their tendering should be removed. In recommendation on face of tender.—R.H., 10/6/91. Under Sec.

Resubmit when we deal with the tenders.—J.B., 30/12/91.



Mr. Hickson looked up the history of contract 56, and then wrote the minute which follows the letter. This minute contains a correct epitome of the facts. The papers were endorsed by Mr. Barling, "Re-submit when we deal with the tenders." On July 30 and August 18, 1891, Mr. E. M. Clark, M.P., wrote to the Department, urging that the work should be gone on with. He was informed that the matter must stand over till the question of further loan expenditure had been determined. Mr. Barling, in his evidence, to be found on page 439, described the state of affairs at that time. The work had in fact to be kept back till February, 1892; but on September 28, 1891, the following letter was received by the Minister:—

*In re* Contract No. 79, Sydney Sewerage Works.

Dear Sir,

88, Sussex-street, Sydney, 28 September, 1891.

On 10th June of this year, we had the pleasure of submitting a tender for the above works, and, we believe, were successful in being the lowest tenderers.

We have been anticipating the acceptance of our tender for some months, but, not hearing from your department, we have, in the meantime, entered upon other obligations, and must consequently respectfully ask you to permit us to withdraw our tender, and to return us the deposit attached thereto now lying in your hands, viz., £369.

We are, &c.,

C. B. BOND

(Bond and Hudson).

The delay would, of course, appear quite sufficient to explain this action on the part of the tenderers. The deposit was returned. Mr. Hickson recommended that fresh tenders should be invited; the recommendation was submitted at once to the Minister, on October 9, 1891. The matter continued in abeyance till February 22, 1892, when the Minister approved of calling for fresh tenders, and the advertisement was at once sent to the *Gazette* inviting tenders for March 9, 1892.

It is necessary here to go back to the time when Bond and Hudson threw up Contract 56. The next lowest tenderers for that contract were Gummow and Gillan. Fresh tenders were called; and in the second tendering Carter & Co.'s tender proved to be the lowest. In the opinion of contractors, it is much fairer to give a contract, under ordinary circumstances, to the next lowest tenderer, when the lowest throws it up. Re-tendering is looked upon as unjust, because in the first tendering the schedules have been exposed; and this gives an advantage to the less expert firms, who, in the second tendering, having studied the schedules, have a chance of using the knowledge disclosed by them, and so pricing their tenders as to bring them just under the lowest of the former competitors. Although Carter & Co. were successful they sympathised with Gummow and Gillan in their annoyance at losing a contract to which they thought themselves entitled; and both firms naturally doubted the good faith of Bond and Hudson in tendering, especially when it was seen that Hudson—evidently the same firm under a different title—again tendered for the same contract and again came out lowest. His tender, however, was of course rejected. These considerations account for the fact that Gummow and Gillan and Carter & Co. joined in the protest against Bond and Hudson when they proved to be the lowest tenderers for Contract 79. This was a job that Carter & Co. were particularly anxious to get, as they were just about finishing work of a very similar nature at Waverley—Contract 53—involving, as the North Shore work did, very deep shafts through sandstone; they had, therefore, the necessary plant; they had also, according to Mr. Carter's evidence, a large quantity of cement on hand; and, although some facts tend the other way, the balance of probability is in favour of the correctness of this account, which is touched upon under the head of Contract 79A. Through the agency of Mr. Kenwood, Mr. Bond's son-in-law, Mr. Carter, finding that the protest sent in was of no avail, and taking advantage of the suspension of the work, induced Mr. Bond, who supplied the money for the firm or partnership of Bond and Hudson, Hudson finding the knowledge and experience—very limited as far as sewer construction was concerned—to withdraw, in consideration of a payment of £750 cash and a promise of a promissory-note for £750 if Carter & Co. succeeded in getting the contract. As they were successful, and as Mr. Carter, in addition to the total sum of £1,500 paid to Mr. Bond, gave Mr. Kenwood £200 for his trouble in negotiating the matter, this transaction cost Carter & Co. in all £1,700. It would seem from Hudson's evidence that he was kept in the dark as to this business, and thought that when the deposit was repaid the payment was made without prejudice to the tenderers' right to the contract, only to be deferred till the Government should be in a position to start the work; he, however, placed the fullest confidence in Mr. Bond, from whom no doubt he received in account

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his share of the £1,500. He deposed to going on several occasions to the Works Department and being told it was not likely that the contract would go on for two years, and that he could get his deposit back without prejudice. This is not improbable, as the money difficulty appeared to be a very serious one for a time. Hudson's manner was that of an honest witness, rather confused as to the exact history of the matter. He remembered Mr. Snodgrass, seeing him and telling him that he and his partner would make nothing out of the contract. His own expectation was that there would be a profit of £5,000. The agreement for withdrawal was not arrived at without some difficulty and a good deal of haggling, according to Mr. Carter. The probability is that Hudson thought he had a profitable contract, that Bond doubted it, and that Kenwood had much stronger doubts; but certainly Carter & Co. must have had great faith in their own ability to get a profit out of their tender prices, and a fair expectation of success in inducing the department to finally accept their tender. A comparison of the date of Bond and Hudson's letter of withdrawal—September 28—with that of Mr. Hickson's notice to terminate Contract 72—October 13—would tend to show that this expectation was not founded upon a knowledge of the possession by the contractors of a powerful lever in the claim afterwards set up for compensation for loss caused by the stoppage; though, as Mr. Carter swore, this claim was used for that purpose; and it was not improbably set up to be so used.

This, however, being the position of affairs:—Carter & Co. having actually paid £750 for the chance of Contract 79, which sum would be absolutely lost if they failed to secure the contract—whether they had or had not foreseen the stoppage of Contract 72, and the advantage over the department which they would thus indirectly gain—that stoppage took place. They at once, it appears from the correspondence, through Mr. B. C. Simpson, wrote to complain of what they alleged was a breach of contract (*Appendix*, page 168, No. 14; 169, No. 18), though it was not till their statement of account (No. 33, page 67, of *Appendix*) was sent in to the department that this claim was made in a tabulated form. The loss for withdrawal of contract set out in that claim amounts to £4,050 9s. 6d. It bears date February 15, 1892.

It was at this stage that the history of these two contracts—No. 72 and No. 79—came to be connected. Carter & Co. were pressing their claim for compensation for stoppage of No. 72, no doubt with the object of securing No. 79. There can be no question that an offer was made by them to this effect, viz.:—If the department will accept us as second tenderers for No. 79, in the place of Bond and Hudson, who have withdrawn, we will waive all claim for stoppage of No. 72. The advertisement calling for fresh tenders for No. 79 was in the hands of the Government Printer; presumably Carter & Co. knew, or guessed, this, and made a special effort to secure their end before it was too late. Re-tendering might have resulted in their losing their chance, at any rate they would probably have been compelled to reduce their prices to give themselves any chance of success. Mr. Lyne's recollection of the facts—naturally imperfect, considering the date—will be found on pages 259—61 of the evidence. Mr. Hickson's account appears on page 564, 5, from question 17099. There then follow Mr. Hickson's and Mr. Lyne's minutes of February 23, 1892. These and the preceding minutes on Bond and Hudson's letter of withdrawal, appear thus in the papers laid before Parliament.

How does this matter stand?—D.C.M'L., 30/9/91. Messrs. Bond and Hudson's tender was recommended for acceptance on 10/6/91. Papers herewith.—F.C.P., 1/10/91. Return deposit.—J.B., 2/10/91. Accountant to return deposit, 2/10/91. I recommend that fresh tenders be invited.—R.H., 6/10/91. Under Secretary. Submitted.—J.B., 9/10/91. Approved.—W.J.L., 22/2/92. Insert notice, 22/2/92. Notice to *Gazette*, 22/2/92. Tenders for 9th March, 1892.

Since writing my minute of 6/10/91, complications have arisen with Carter & Co., *re* their contract No. 72 having been stopped. They have made large claims on this account, some of which no doubt could not be entertained; but on some items they have made a good case. They are prepared, if they obtained this work, to waive all claims on No. 72. As their tender is a reasonable one, and some £3,600 below the estimate, I think it might fairly be accepted. If this course were adopted, work would be given at once to a large number of men.—R.H., 23/2/92. Under Secretary. Important.

As Mr. Hickson thinks Messrs. Carter & Co. could make good a claim for something like £2,000 as compensation on Contract 72 (Moni-street, partly), should they be willing to forego this claim, their tender may be accepted for construction of the main outfall sewer, North Sydney—£39,890, as worked out at schedule rates. If this firm will not agree to the condition imposed, fresh tenders to be invited.—W.J.L., 23/2/92.

Mr. Hickson.—D.C.M'L., (for U.S.), B.C., 23/2/92. Please see me with Messrs. Carter & Co.—J.B., 23/2/92. Mr. Hickson.

In a matter of such importance, it is only reasonable to suppose that Mr. Lyne and Mr. Hickson had a conversation on the subject before these minutes were written, and that Mr. Lyne went into the question himself before he determined what course it was best to take. But Mr. Hickson might, if he were so inclined, by misrepresentation of facts or the strong expression of an assumed opinion, have succeeded in improperly procuring the assent of the Minister, in itself undoubtedly honest and impartial. The question is whether the circumstances justify such a charge of partiality exercised in favour of Carter & Co.

First, it is necessary to inquire into the apparent right of the Contractors to any compensation. Clause 3 of the Specification to Contract 72, provides "that the lower 13 or 27 chains of the channel shall not be constructed until the Engineer gives a written order to that effect; and the Engineer shall have power to suspend the execution of those portions of the work, or any other part of the Contract, or to reduce the length of the Contract by the extent of the said 13 or 27 chains, or any other part of the sewer shown on the drawings that he may consider necessary; and the Contract shall not thereby be invalidated, nor shall the Contractor be entitled to any compensation on account of such temporary suspension of any part or parts of the contract, or permanent reduction of same." The second part of clause 39 reads thus:—"If the 13 or 27 chains of the outlet end of proposed storm-water sewer (as provided in clause 3) should not be excised from the present Contract, then, pending the completion of proposed ship canal to its junction with proposed storm-water sewer, an open channel, when ordered, to be excavated to such gradients, depths, and cross-sections, from the junction of the two channels to the present head of said ship canal, a distance of about 32 chains, as shown on drawing No. 1, and as shall be determined at the time." The last paragraph of clause 4 of the "General Conditions" is as follows:—"The Minister, or the Engineer acting on his behalf, may, from time to time, by writing under his hand, require the omission of any particular portion or part of the works described in the specification, or shown on drawings; and the Contractor shall have no claim for loss of profit, sustained damage, or other compensation, on account of any such omission." Finally, the fifth paragraph of clause 10, of these conditions, runs thus:—"On receiving a written notice to that effect from the Engineer, Contractor shall suspend the whole or any portion of the works, as may be directed in such notice. He shall have no claim for loss or damage on this account, unless the suspension exceeds one month; and such suspension shall in nowise vitiate the contract, but a commensurate extension of time for completing the works will be granted to the Contractor." When the order stopping the works was given, it was in the form of a complete stoppage. When the question of granting the Contractors No. 79 was settled, it must have been evident that, in all probability, the stoppage would be converted into a suspension for some period exceeding four months. The Department might be in a position to offer to allow the Contractors to finish the work, and so turn the stoppage into a suspension; though, on the form of the notice, the Contractors might object to this and refuse to go on. So they would clearly have some substantial claim, unless the conditions of the contract should be construed to justify such an excision as had been made. Without expressing any definite opinion on the point, your Commissioner has very grave doubts of the right of the Engineer, under the terms of this contract, to adopt so radical a course as the cutting off of a substantial part of the subject-matter of the agreement, especially in the face of the fact that he was expressly permitted to leave out one of two defined parts, distinct from that which he attempted to excise. It seems to be a case to which the principle "*expressio unius, exclusio alterius*" might apply. The exercise of the apparent power in the way in which it was sought to be taken advantage of is so absolutely opposed to the sense of the contract, and might so completely deprive the Contractor of any benefit to be derived from it, that, even without the giving of the expressly defined right, there would be a question; and the doubt would be much increased by the defining of the parts which might certainly be cut out. The reasonable construction of the paragraph of Clause 4 of the General Conditions is that it applies to details. The paragraph in Clause 10 may be read as merely limiting the Contractor's right to compensation for suspension; the leaving of the clause as it stood instead of altering it to suit clause 3 of the specification was clearly an oversight; if, however, an attempt were made to read it in conjunction with that clause, then it would appear, by implication, to clash with it. On the whole

whole the point was such as would leave so much doubt on the mind of anyone as to suggest the inexpediency of allowing it to go before a Court. And, of course, if, as a matter of law, the Department should be held to be in the wrong, then Mr. Hickson could have no hesitation in avoiding the folly of leaving the question of damages to a jury; a man of his experience would be justified in making any reasonable concession rather than risk the danger of such an excessive verdict—with the addition of enormous costs—as any person suing the Government might fairly—or unfairly—hope for. As to the reasonableness or otherwise of the claim, if the case was to be taken as one of suspension, then, certainly, all the larger items would go for nothing, and a comparatively small proportion would remain. But, even so, it does not follow that a conversion of the stoppage into a suspension would have saved the Department. The notice of 13th October had expressly terminated the contract; if this was a breach, then it could not be supposed that the Contractors would consent to take the work up again except on terms; the experience of other cases showed that for the mere delay a heavy charge might be made, and some considerable sum would practically, to save the risk of an action, have to be allowed; aggrieved as the Contractors, against whose protest Mr. Hickson had decided, would probably feel, they might be expected to make every effort to enforce their alleged rights. What might reasonably be expected was this: that they would either, if their offer were refused, do their utmost to recover the whole sum of £4,000, or they would only consent to carry on and finish Contract 72, assuming that the necessary funds were available, on the terms that they were paid some large proportion of this sum by way of compensation for delay. Then came in the other considerations relating directly to No. 79. The department had estimated the cost of this work at £43,494 10s. 6d.; the amount of Carter & Co.'s tender was £39,890, £3,600 lower. Gummow and Gillan offered to do the work for a sum exceeding this by £950; but the average of the tenders of the four remaining contractors was over £52,000. Leaving Bond & Hudson's tender out of the question, Carter & Co.'s appeared exceedingly low. And in the light of Bond & Hudson's former conduct in tendering so low that they had to throw up their contract, then again in trying to evade the rule of the Tender Board by untruly varying their title; lastly, in tendering for No. 79, and then, as it appeared to the department, taking the opportunity of delay to withdraw; in view too of the fact, probably known to Mr. Hickson, that Bond had absolutely no knowledge, and Hudson very little, of the work to be done; it was only reasonable to neglect their tender—nearly £6,600 below the estimate—in trying to arrive at the fair value of the contract. Certainly, the lapse of time—over eight months—was a reason for refusing to accept the second tender; the strongest reason, the great difference between the lowest and the second, disappears if the lowest deserves no consideration. The want of proportion in the prices of Carter and Co.'s Schedule might have been taken exception to; but Mr. Bagge was supposed to have gone over the quantities with his usual care; if they proved correct no such irregularity would affect the total sum; and Mr. Hickson's attention does not appear to have been directed to these peculiarities. Mr. Bagge's evidence,—so far as his recollection can be trusted at all—on page 404, question 13,106, must refer to Contract 69. It was evidently that contract that called for special notice in relation to schedule-rigging. The great depth of the shafts in No. 79 would explain high rates for excavation in shafts; and the general features of the part of the North Shore through which the sewer runs denote a close approach of the solid sandstone rock to the surface. Other peculiarities that would be likely to catch the eye are the disproportion—too small a difference—between excavation by guttering and gadding and by blasting, the nominal price for timber left in the work for subducts, and for hand-packed filling, and the great difference between the rates for brickwork in two rings and in one ring. The reasons for all these peculiarities are obvious. The contractors surmised that an unnecessary proportion of the ground had been placed under the head "guttering and gadding," that therefore there would in the actual work be a decrease in this mode of excavation and a corresponding raising of quantities in the blasting, which increase again, with the "margin" addition, would cause the total of highly priced sandstone concrete to be greater; that, in the generally solid rock, hardly any timbering would be required; that in such country subducts would not be used, and so there would be barely any hand-packed filling paid for; lastly, that in ground of that class no two-ring brickwork in tunnels would be ordered; and, if it were, the comparative lowness of the price would be compensated

compensated for by an increase in well paid excavation. It might also be noticed that the high price of excavation in shafts would have the effect of raising the amounts of the early vouchers above the average, and so putting the Contractor in funds to carry on the works—a dangerous position, perhaps, in which to put untried men, who might throw up the work in an unfinished state, but not involving the same risk in the case of established and capable firms. On the whole, it may be said that this was a cleverly drawn Tender, a good example of Schedule-rigging, but with no very outrageous peculiarities, and not showing those violent disproportions which made the Schedule of Contract 69 so conspicuous.

As has been remarked, Carter & Co. stood to lose £750—paid to Bond—in any case; it would only be on their succeeding in gaining Contract 79 that they would have to pay the balance, £750, and, presumably, to give some bonus to Mr. Kenwood. A question arises:—Had Carter & Co. some assurance from the Department, or some sort of promise, that they would receive assistance in that quarter? £750 was at stake. Here it is important to consider the nature of the men. Mr. Carter's remarkably free-handed way of dealing with money, indicating an absence of that strong disinclination to part with it without more or less certain consideration, which is not uncommon in "business men," strongly affects the probabilities. Mr. Snodgrass, by his peculiar mode of filling in schedules, shows that the tendency to gamble is strongly developed in him; and the consequences are not repudiated by his partners. Mr. Forrest, who was not to be a party to Contract 79, but who appears to have shared in the profit and loss on that venture, evidently trusts implicitly to his partners; personally, his manner certainly does not suggest wild speculation as a failing. Contracting for important works of construction involves so much risk and uncertainty, and the dealing with such large sums of money, that, under pressure of what may almost be called the necessity of procuring the right to carry out a certain undertaking, men may well stake even so large a sum as £750 for the purpose of removing an obstacle, without having any certain assurance that they will finally gain their end. There is absolutely no evidence to show that the officers of the Department knew or suspected that Bond & Hudson had been paid off; nor has there been suggested any reason why Mr. Hickson should favour Carter & Co. in carrying out such an arrangement. His connivance in it would be, and would appear clearly to him to be, a scandalous departure from duty and honor; he began by standing out against the protest of the firm. It is only fair to infer from all the circumstances that the dealing with Bond & Hudson was carried on behind his back, and was suggested by the delay that was unavoidable in the acceptance of their tender. It appears to your Commissioner to be hardly the province of this commission to inquire into the conduct, independent of the Department, of Carter & Co.; but inasmuch as they were allowed a *locus standi* throughout the inquiry, and their actions were necessarily brought under review, some comment may be made on this peculiar transaction. There is no doubt that an indulgence in such practices would defeat the whole object of tendering, and that a sale of the right to a contract is very like a conspiracy to defraud the Government, and that, therefore, such a course of conduct is most improper. But still, on the question how the parties to that particular proceeding looked at it; having regard to what Carter & Co. knew of the chances of success of Bond & Hudson, and of their own ability to do the work properly, and knowing what a common thing in business is the assignment of rights of every kind, without a thought of dishonesty entering into the minds of the parties, your Commissioner is inclined to believe that, in removing from their path what they probably regarded as an obstruction, as useless to the country as it was inconvenient to themselves, Carter & Co. did not imagine they were doing an immoral or dishonest act. But after the experience now, it would appear, for the first time gained by the Department from the evidence on the inquiry, and in the light of the various comments made on the transaction, it is to be hoped that every care will be taken by the Department to prevent, and by the Contractors to avoid, a repetition of what would be a most dangerous precedent.

Putting together all the facts, with the additional circumstances that, as far as is disclosed by the evidence, Mr. Hickson had not even seen Mr. Carter till the work on No. 72 had started, and was unacquainted with other members of the partnership; that he had no reason of any kind, apparently, to favour the firm, unless it be that he had found them capable and trustworthy; and that up to this

time

time there was no idea whatever in his mind of retrenching his son; the only fair inference is that Mr. Hickson, in recommending Mr. Lyne to take the course accepted by him, was acting in absolute good faith, and, as he believed, in the best interests of the country. Applying this conclusion (which is the finding of your Commissioner on the facts) to the second clause of the first charge under the head of Contract 72, your Commissioner is of opinion that that charge should be taken as disproved, though it is rather difficult to determine what the words "without a proper test" should be taken to mean: if they imply that the question should, under all the circumstances, have been left to the decision of a Court of law, then your Commissioner certainly comes to a different conclusion; if they mean that a legal opinion ought to have been taken before a decision was arrived at, then your Commissioner thinks that might have been a wise and proper course to pursue, but that the omission to do so was not the result of any unfair bias on the part of Mr. Hickson. As to the first clause of the charge, that must be taken to relate to the expenditure on the earth channel, and on the covering of the concrete channel under the sand ridge, adding to the quantities for girders and brickwork; the former expenditure was for work forming a necessary part of the contract, and was therefore proper: the latter was justified by the conditions imposed by Mr. Hill shortly before the contract started.

This finding also appears to include the allegation in the first sentence in the second charge. As to the use of unauthorised moneys, it would seem that the only moneys applied to the purposes of Contract 72, before the suspension, were the sum of £15,500, specially voted for it, and the balance of the sum of £8,000, left after Parry and Farley's Contract 75 had been paid for. This latter sum was legitimately applied to Contract 72, inasmuch as that work, so far as it was partly paid for by this balance, was actually a necessary extension of No. 75, for which the £8,000 had been voted. If there was any irregularity in this course, then it was one merely in form, and not in substance, and one moreover for which Mr. Hickson was not responsible in his capacity of Engineer.

The third charge relates to the withholding of papers. In the first place, as has already been pointed out, Mr. Hickson had, personally, nothing to do with this matter. But, as far as the action of those concerned in it was concerned, the order of the House must be considered. The papers to be laid on the table are thus described:—"Copies of all papers and correspondence in connection with the contracts of Messrs. Carter, Gummow, & Co., at Marrickville, Balmain, North Sydney, Johnston's Creek, and Stanmore, including the specification, schedule, &c., for original contracts, and for substituted ones, and all vouchers paid and details of same, and such other matter included in the transactions, from commencement to the present date." This order mentions specifically contracts carried out in particular localities; it does not by any means include all the contracts held by any combination of the names of these contractors. It can only be intended to cover contracts situate in the districts named, though not necessarily nominally held by the firm of Carter, Gummow & Co., *e.g.*, North Shore contracts were held by Carter & Co. Therefore No. 72, being in Macdonaldtown and Alexandria, is clearly excluded; No. 69 satisfies the order as far as Marrickville is concerned; No. 72 is altogether outside of that district. But an examination of the Contract of No. 79 discloses the fact that No. 72 is involved with it in this way:—that, while Carter and Snodgrass are the contractors in No. 79, they are joined in the contract with Forrest for the purpose of a release executed by all three contractors for No. 72. The agreement recites the general facts concerning the claim and the compromise. The release of the claim, and the contract by Carter and Snodgrass for No. 79; are thus contained in one document, executed by Carter, Snodgrass, and Forrest. Mr. Barling, on page 443, Question 13,963, has explained how these papers came to be produced at all. Further on, in answer to Questions 13,974 to 13,982, Mr. Barling gives a full account. This explanation your Commissioner takes to be quite satisfactory.

Taking together, finally, the whole of the facts proved in relation to Contract 72, your Commissioner is of opinion that they do not support the charges made under the head of this contract.

One other matter, which was touched upon in the course of the evidence, but which is more particularly noticeable because it appears to have formed the ground of a complaint against Mr. Hickson made by Mr. Parkes in Parliament, should be mentioned here. It is not clear under which of the divisions of the charge made in relation



relation to this contract it was intended to fall, if under any of them; and your Commissioner gathers from Mr. Parkes's address that he does not now attach any importance to it. The facts appear on page 167 of the Appendix (No. 12). After the earth channel was completely finished, a quantity of sludge was washed into it—breaking down the bank of the channel at its northern end, and cutting away a gutter up stream from it—by a heavy fall of rain, which, by itself, might not have caused the mischief, but the effect of which was aggravated by the action of the wool-scourers further up the creek—or swamp—in opening their sluices to allow the rush of water to clear out their dams. This was explained by Mr. Davis—page 470 of the evidence, Q. 14,783. Mr. Bagge, as the papers in the Appendix show, reported that it would be unfair to ask the Contractors to remove this silt. His view appeared to be a just one, and it was accepted. The stuff was left, and finally cleared out by day labour. The Contractors were therefore never paid for this work in any way. On page 453 of the evidence, Q. 14,333 to Q. 14,345, Mr. Davis gives further particulars of this matter. It discloses no ground of complaint against Mr. Hickson.

### CONTRACT 77 (ANNANDALE).

1. *With calling public tenders for Contract 77 upon plans for elaborate and costly work, and allowing Messrs. Carter, Gummow, & Co. to submit a plan of their own upon a patent held by them and an officer of the department, and at their own price, unchecked by the department as to real cost, by which Messrs. Carter, Gummow, & Co., got an advantage over the Crown of £4,000.*

I think I have clearly proved that a concession was made to this firm by which the country lost a considerable sum of money. If the work had been properly tendered for there would no doubt have been a saving of at least £2,500.—*Hansard*, 26th September, 1895.

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In my speech I stated that cheap material was substituted for what was provided in the Government scheme. I said that a cheap class of concrete was used, instead of the concrete which was specified. In reply to that the Engineer-in-Chief says:

“The materials used in the Monier arches and sewer, substituted for brick and concrete, was not sandstone and concrete; it was three to one compo., and was estimated by the department at from 80s. to 90s. per cubic yard, not at 28s., as stated.”

Now, as a matter of fact, it was nothing of the sort. It was estimated as being of a lower value, as will be seen by these papers. But it will easily be understood by hon. members that a compo. three of sand to one of cement is not as costly as a compo. of two of sand, three of blue-metal, and one of cement. Three of sand to one of cement is what you call cement mortar, and it makes a very light material.—*Hansard*, 12th May, 1896.

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Now, I come to Contract 77, which is for the Balmain sewerage. The papers are at page 205. That is a contract in which part of the work was to be a tunnel and the rest an aqueduct. Under the Government plan the aqueduct was to be superior concrete with brick and cement arches. It was to be self-supporting—that is to say, sufficiently strong for vehicles to go overhead, if that had been the purpose. It was to be brickwork of the very best description, and the bricks were to be patent kiln burnt. It was thus to be a work of the most permanent nature. Yet the Government, under the Secretary for Public Works, allowed the contractors for a saving of £250 to substitute a scheme of their own consisting of cement arches which would not stand unless supported by tie-rod iron. The best description I can give of that to hon. members is to take this Chamber, and to suppose that the walls are so weak that they cannot sustain the roof, and the weight of the roof is sufficient to push out the walls. The first thing to be done under such circumstances would be to put in iron tie-rods. These arches are so weak that they cannot sustain themselves, and have to be tied with iron tie-rods. That is what the Minister allowed the contractors to substitute for his own good, permanent, plan.

Mr. YOUNG: Will the hon. member be fair enough to read the advice on which I acted?

Mr. PARKES: I cannot read everything in these documents.

Mr. YOUNG: The hon. member will not read what is fair!

Mr. PARKES: I will show on what advice the Minister acted. This patent, with regard to the Monier arch—this useless, risky, thing—was invented in Germany thirty years ago for ornamental work in gardens, and it was never intended for such work as I am referring to. This cheap thing was reported on by Mr. Bagge, and he shows that it is 50 per cent. cheaper than the Government scheme. Now, in the first instance, in 1893, Carter, Gummow, & Co. offered this thing to the Government for £1,500. They offered to sell it to the Government, but in this one contract the Government leave them their patent and give them a preference of £3,000—that is, the whole of the contract for the use of this patent in the grave losing job. In his report, on the 21st September, 1894, Mr. Bagge says:—

“The sewerage aqueducts have hitherto been constructed here in such a manner, method, and of such materials, that any competent tradesman, in his special line, obtainable in the Colony, could do the work.”

“Now, however, as it is a matter of the greatest importance to reduce the cost of the works, there seems to be no other way of accomplishing this object than to adopt for this Colony a more or less experimental system of construction for these aqueducts—of increasing the spans of arches, introducing arches with joints, of constructing the whole in concrete, and of constructing the whole of the work of concrete and mortar and iron.”

Then he goes on to say:—

“In the old home countries these novel systems of construction have caused in the commencement failures, owing to the works being carried out by more or less inexperienced and untrained engineers and artisans; hence the various State governments would not entertain and construct works on these novel methods until special companies established themselves, who made it their special business to carry out such works with artisans who had had time to gain the necessary experience, and who had been practically and specially trained in the construction of such work.”

“It was only to such companies that works, which are termed purely and simply specialties, were entrusted, after they had given adequate security for the faithful, careful, and competent, execution of same.”

Now, when this work was submitted to the Secretary for Public Works, Mr. Bagge reported in this manner: He sent in a report in which he drew a comparison between Mr. Ahearn's contract on the sewage farm, and he showed clearly by his figures that this work was 50 per cent. cheaper than the work specified by the Government. I ask hon. members to mark how the Secretary for Public Works was so cleverly outwitted.

Mr. YOUNG: Where does Mr. Bagge make those statements in his report?

Mr. PARKES: He says this:

“The plans for the White's Creek and Johnstone's Creek aqueducts as designed in this office, for which tenders were invited, were prepared with a view to securing the most substantial and enduring structure at the most reasonable cost. At the time that this design was made, I had as full particulars regarding the 'Monier' principle as it was possible to obtain in the Colonies. I would also like to point out that in Europe this class of work is made a specialty, being patented,

patented, and is wholly in the hands of private companies, who are required to give a substantial guarantee for the stability of their work. I think it would not be advisable to construct at the outset a work of such importance on the 'Monier' principle.

"The total for the office design amounts to ..... £15,757  
 "The total for the contractor's Monier design ..... 15,500

"Difference..... £257"

Mr. YOUNG : The Honorable Member said it would cost 50 per cent. less !

Mr. PARKES : This is in a report laid on the Table of the House on the 5th October, 1895. Now, let me show you what the Engineer-in-Chief says. This will show how these officers catch the Minister. The Board of Reference, on the report of the Engineer-in-Chief and on his advocacy, sent in this report to the Minister :—

"The Board, in view of the fact that Messrs. Darley and Hickson are satisfied that the principle is a sound one, and that the adoption of the plan will result in considerable economy, are prepared to endorse the recommendation of these gentlemen, and now submit the matter for the Minister's consideration."

It goes on to the Minister, and he writes :

"Before approving of this proposal, I should like an estimate of the actual value of the work to be carried out by the contractors under the substituted scheme."

That is very fair. Listen to the report of the Engineer-in-Chief :

"To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm estimates were made for the work on the Monier system, as well as on the department's designs. The result was that the estimate of both works was practically the same."

But there is an estimate, according to Mr. Bagge, that it is 50 per cent. cheaper.

Mr. YOUNG : Who is to be believed—Mr. Bagge or the Engineer-in-Chief? It is simply a matter of opinion !

Mr. PARKES : But Mr. Bagge's report is the one referred to, and here we have a report submitted to the Minister by the Board of Reference recommending the adoption of this substituted work on the ground that it is cheaper but the next day he obtains a report from the Engineer-in-Chief telling him that the cost of the two methods is the same. Then he says, "That is sufficient for me ; I will authorise the substitution." Then the Minister accepts this "cheap-John" thing on a report of that description. Why, if he were charged the same price, there was the more reason that he should stick to the good and substantial work of his own office.—*Hansard*, 12th May, 1896.

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 In connection with this contract, there is no doubt, from estimates I have made, and which I challenge anyone to refute, that the works saved to these contractors by the substitution of their own plans and specifications are equal to about £4,000. Instead of the saving to the contractors being only £275, as the Government put it, it is from £3,500 to £4,000.—*Hansard*, 12th May, 1896.

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 In the first place, they competed for some sewerage works which were going on at Balmain. Hon. members are well aware that these contracts are tendered for nowadays at schedule prices, that is to say, quantities are taken out and the Government officers place schedule prices upon each of the items. Fifteen firms of contractors tendered for the works at Balmain at schedule prices, and the lowest tenderer was the firm of Messrs. Carter, Gummow, & Co. These contractors sent in a price ridiculously low as compared with the fourteen other firms tendering. Their tender was 28½ per cent. under the schedule prices. The next was 18½ per cent. After their tender was accepted, and after they were notified of the acceptance, they were enabled to place plans in the department for the carrying out of the work upon an entirely new plan, called the Monier system. The other contractors had no opportunity of competing with the firm for the carrying out of the work upon this system. I am assured by other contractors that whereas Messrs. Carter, Gummow, & Co. obtained a contract at £15,500, they would have been willing to carry out the job at £12,500 to £13,200, effecting a saving of from £2,300 to £3,000. Under the schedule prices of which I have spoken there is one item put down for brickwork and cement arches, 2,020 yards, at £2 10s. a yard. That was substituted under the Monier system by sandstone and concrete, put down at £1 8s. per cubic yard. There was that difference in the prices for the 2,020 yards. On that item alone a concession of £1,650 was made to these contractors. Hon. members will see that when such concessions are allowed other contractors must be quite within the mark in saying that if they had had the opportunity they could have carried out the job at a figure from £2,300 to £3,000 below that paid to this particular firm.—*Hansard*, 26th September, 1895.

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 I think I have clearly proved that a concession was made to this firm by which the country lost a considerable sum of money. If the work had been properly tendered for there would no doubt have been a saving of at least £2,500.—*Hansard*, 26th September, 1895.

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2. *With deceiving the Minister as to the true cost of the Monier patent by minutes written by Robert R. P. Hickson, the then Engineer-in-Chief of the Department.*
  3. *With deceiving the Minister, by which he (the Minister) accepted of certain security, which was of an improper and useless nature, for the stability of the patent for a term of three years, the deception being contained in minutes written by Robert Hickson, the then Engineer-in-Chief for Public Works, knowing that the security was not of a proper nature to submit.*

There is an exceedingly clever piece of business, and hon. Members ought to follow it. Messrs. Carter, Gummow, & Co., in submitting their tender, said that they were prepared to find sureties for £6,000 each to guarantee the maintenance of this work for five years. Their specification is here—it is not an office dictation, but their own submitted undertaking. Carter and Gummow write :—

"We have the honor to draw your attention to the conditions upon which the acceptance of our tender depends for Contract No. 77, Balmain sewerage works, and to our conversation with you of even date in connection with security required for its due performance.

"We respectfully submit that our personal sureties for the amount necessary should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work.

"We are a firm of sound financial standing, well and favourably known to your department as contractors for many large and important contracts extending over a period of eight or nine years under the Departments of Harbours and Rivers, and Roads, Bridges, and Sewerage, which facts we trust will satisfy you as to our *bona-fides* in this matter."

That is, they offer their own firm as their sureties instead of a personal undertaking. Mr. Hickson, in reporting on this, commences by saying :—

"The accompanying letter of 4th April, 1895, from Messrs. Carter, Gummow, & Co., is a protest against the stringent supplementary specification prepared by Mr. Norrie, at my suggestion, with regard to the alteration in the design of Contract No. 77."

It is not a protest ; it is an offer in substitution of the contractors former offer.

The last paragraph of this specification states :—

"And the contractors shall enter into a bond to Her Majesty the Queen in the penal sum of £12,000, with two sufficient sureties in the penal sum of £6,000 each, to secure the removal of so much of the said works as shall have been constructed on the Monier system, &c., &c.

"The amount of £12,000 is the sum it would cost the department, at departmental rates, to renew that portion of this sewer which is built on the Monier system.

"It is right, however, to say that the tendered rates for this portion of the work would only come to £9,000 ; but, prices being abnormally low, I think it is only right to put in a sum at which the department really values the work.



"Messrs. Carter and Gummow ask that their own 'personal sureties for the amount named,'—that is, £12,000 (an amount which they do not dispute)—'should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work.

"They go on to say that they are 'a firm of sound financial standing, well and favourably known to the department as contractors.' This is quite true. They are a firm in which I have every confidence. They have done a great deal of work under me, and I can testify that their aim always has been to turn out the very best class of work possible."

I may tell honorable Members that before this minute was written Mr. Hickson had to put a new bottom to the Pott's Hill reservoir which these contractors built, and also a new bottom to the Waterloo sewer. I want honorable Members particularly to mark what I am now going to read :

"At the same time, misfortunes happen to the very soundest firms of contractors, and the department must look a little way into the future. Their own bond for £12,000 would be really of no use if they were unfortunate enough in the meantime to become bankrupt.

"I think, therefore, it is right that the sureties should be insisted upon. They give the names of two men—Mr. George Forrest and Mr. James Gillan. From inquiries made, I believe these men to be financially sound, and I think if their names were accepted as the sureties in the penal sum of £6,000 each the department would be secured as far as it is reasonably possible to be."

When Mr. Hickson wrote that letter he knew that these two men, Forrest and Gillan, were members of the firm to which his son was the acting engineer.

Mr. YOUNG : Will the hon. Member read the last sentence ?

Mr. PARKES :

"This work will be carried out under Mr. Darley, and I recommend that the whole of the papers be sent him, to give his opinion thereon."

Mr. YOUNG : Now let us have Mr. Darley's report !

Mr. PARKES : Why ?

Mr. YOUNG : It is only fair to Mr. Hickson !

Mr. PARKES :

"I concur with Mr. Hickson. I think in accepting a new patent of this kind, and adopting it in a large and costly contract, that the department cannot be too careful in securing its position by leaving all the risk in the hands of the contractors and patentees. I, therefore, recommend that the personal names be required for further security. The names mentioned may, I think, be accepted."

I expect that Mr. Darley, without bothering himself, and relying upon Mr. Hickson, indorsed Mr. Hickson's minute. That letter was written on 5th April, and Mr. Hickson's son came up from Adelaide with Mr. Gillan to sign that bond as an independent surety, and the Secretary for Public Works accepted it.

Mr. CRICK : Does the honorable Member mean that the Secretary for Public Works knew that these men were members of the firm ?

Mr. PARKES : He must have known it, because they signed contracts two years before as members of the firm, and Mr. Hickson's son was engineer for the firm at Adelaide, and was along with Mr. Gillan. He knew that when he wrote that minute this was the case—it is a gross piece of deception on his part. That minute was written on the 5th April, 1895 ; and on the 13th April, 1895, this notice was published in all city papers :—

"Notice is hereby given that the partnership lately subsisting between us, the undersigned, John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing, as contractors, carrying on business in Adelaide (South Australia) and Sydney (New South Wales) under the name, style, or firm of Carter, Gummow, & Co., was on the 1st day of April, 1895, dissolved by mutual consent in so far as regards the said George Maddison and Peter Ewing, who retired as from that date from the said firm. All debts due or owing by the said firm will be received and paid by the said John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, and James Gillan, who continue the business under the same style of Carter, Gummow, & Co."

I ask the Secretary for Public Works what is the good of that surety bond ? The Engineer-in-Chief says he could not think of accepting the whole firm as their own sureties, and then he goes on knowingly and recommends that two members of the firm—that is, part of the whole—shall become sureties for the job. Is that not deception ? It is deception perpetrated with intention. I will show how clearly the intention is made out. In all other contracts the specifications contain this paragraph :—

"In submitting a tender the full Christian name of the tenderer must be given, or, when the offer is in the name of a firm, the names in full of each member. When bondsmen are required, the names in full, occupations, and addresses, must be stated in the tender. The omission of this information will render the tender liable to be declared informal."

Now, that item is omitted in the contracts for this No. 77 job. In addition to that, the statutory declarations which Messrs. Forrest and Gillan made are in these words :—

I, George Forrest, of Marrickville, in the Colony of New South Wales, householder, do hereby solemnly declare and affirm—"

Hon. Members will see that from this statutory declaration is omitted the place of residence or the fact that Forrest is a contractor. The other declaration says :—

"I, James Gillan, of Dulwich Hill, in the Colony of New South Wales, householder—"

Although he lives in Adelaide it is not so stated. It omits the fact that he is a contractor. It is fixed up so as to leave Forrest and Gillan open to sign this bond. There is no doubt about it that the whole matter is bogus ; for if the contractors become insolvent, and the whole thing bursts up, and they have no estate to come upon, what security is there to cover this risk ? I quote this to show how the Minister has allowed himself to be hoodwinked by the officers of the department.—*Hansard*, 12th May, 1896.

that they have by minutes hoodwinked the Minister—and minutes of such an extravagant nature that he ought himself to have been able to see them, because I, not a Minister but with these incomplete papers, was able to see these things in ten minutes. For instance, what Minister could make a mistake in a case of this kind ? Mr. Bagge reports to the Minister that the work on the Monier arch can be done at £6 per lineal foot as against £10 per lineal foot on Abeam's sewer work at the Sewerage farms, under the Government Engineer's scheme and plan ; and the Engineer-in-Chief states that he has made a comparison between the two, and he finds that it will cost exactly the same as the other, his reference being to this very report. Yet here is a paper showing that the test when made was 50 per cent. cheaper.—*Hansard*, 12th May, 1896.

The case which I am about to cite will illustrate the position I take up. There is a set of contractors whose names or titles are Messrs. Carter, Gummow, & Co. They contract for various works in this country—at present most of them are about Sydney. This firm of contractors are identified with the Government in the most suspicious fashion. During last week, or the week before, I asked the Secretary for Public Works whether Messrs. Gillan and Forrest were not sureties for the proper fulfilment of the contracts of this firm of Carter, Gummow, & Co. The reply I got was that Messrs. Gillan and Forrest were the sureties for those contractors. I wish hon. Members to closely follow this matter. What I am about to read is a notice which appeared in the *Sydney Morning Herald* on the 13th of this month—that is, last Friday week—not very long ago. The notice shows that a dissolution of partnership took place, and that the very sureties for Carter, Gummow, & Co.—Messrs. Gillan and Forrest—are members of this business. The following is the notice :—

"Notice is hereby given that the partnership lately subsisting between us, the undersigned, John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing, as contractors, carrying on business in Adelaide (South Australia) and Sydney (New South Wales) under the name, style, or firm, of Carter, Gummow, & Co., was on the 1st day of April, 1895, dissolved by mutual consent in so far as regards the said George Maddison and Peter Ewing, who retired as from that date from the said firm. All debts due or owing by the said firm will be received and paid by the said John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, and James Gillan, who continue the business under the same style of Carter, Gummow, & Co.

"As witness our hands this 1st day of April, A.D., 1895.

|           |                  |                  |
|-----------|------------------|------------------|
| "(Signed) | F. M. GUMMOW.    | GEORGE FORREST.  |
|           | JOHN CARTER.     | GEORGE MADDISON. |
|           | D. G. SNODGRASS. | PETER EWING.     |
|           | JAMES GILLAN."   |                  |

That

That is a nice state of affairs. I wish to point it out to hon. Members, if they do not quite realise it. If the Government accept sureties consisting of persons who are members of the firm of contractors, supposing the contractors go insolvent, or cheat the Government by defective work, suppose they enter into fraud to defeat the Government in large contracts of £30,000 or £50,000, what check is there upon them? The very specification which the Government issue makes it imperative that these sureties shall be disinterested persons altogether. The object of having sureties is to have men of means at the back of the contractors, so that if anything goes wrong—if the contractors go insolvent, or defraud the Government, if they carry out bad work, the Government can come down upon the sureties. But here is a case where these contracts total nearly £100,000, with sureties of their own partnership. This is a nice state of affairs. I wish to go further, and to show that there has seldom been a case, taking it in this way, in which any private business would offer to give away contracts to the extent of £20,000, without offering them to competition and to tender. No private individual would ever dream of going into such a business transaction such as that. Yet this firm of contractors, Messrs. Carter, Gummow, & Co., have received between £45,000 and £50,000 of Government contracts without any tender.—*Hansard*, 26th September, 1895.

I do not at all blame the Secretary for Public Works in this matter; we know him to be a gentleman of the strictest integrity; but there can be no doubt that the Engineer-in-Chief and the Under Secretary for Public Works have led him into various mistakes.—*Hansard*, 26th September, 1895.

The greatest mistake into which he has been led was that of putting Mr. Hickson in the position of Engineer-in-Chief and putting out of the department a man infinitely his superior—I mean Mr. Darley—to take charge of the Water and Sewerage Board.

Mr. YOUNG: He agreed with the recommendation!

Mr. V. PARKES: Of late years he has done almost anything that the Engineer-in-Chief asked him to do. There can be no doubt that as an engineer he is infinitely superior to Mr. Hickson. The Secretary for Public Works I find made a query upon the report of the Board of Reference.

Mr. YOUNG: Read it!

Mr. V. PARKES: "The tenders for this work were submitted to the Board to-day. In doing so, Mr. Hickson pointed out that fifteen tenders had been received, the lowest being that of Carter, Gummow, & Co., at 28½ per cent. below schedule rates, amounting approximately to £15,757 1s. 9d. The same firm also submitted a lump sum tender for carrying out the work according to a plan sent in by them for the sum of £15,500. The plan submitted is for constructing the work on the Monier arch principle. This system has been extensively used during recent years on the continent of Europe with successful results, and Mr. Hickson sees no reason why, under certain restrictions, the opportunity should not be taken to introduce the system in the public works of this Colony. The advantages claimed by the patentees are that works can be carried out at a much cheaper rate wherever this method of construction is used. Mr. Hickson said he had no doubt that the design submitted was thoroughly suitable and likely to be effective; and, as the main principles as regards size and inclination of sewer were as provided for in the departmental design, he was prepared to recommend it for adoption; but, if it was decided to accept the tender, a short specification of the work should be included in the bond, and provision also made for the maintenance of the work by the contractors for a certain period after completion.

"Mr. Hickson further said that, as Mr. Darley would be the responsible officer for carrying out this work, he had gone into the matter very thoroughly with that gentleman, and Mr. Darley was quite prepared to indorse his views.

"The Board, in view of the fact that Messrs. Darley and Hickson are satisfied that the principle is a sound one, and that the adoption of the plan will result in considerable economy, are prepared to indorse the recommendation of these gentlemen, and now submit the matter for the Minister's consideration."

The Board having, in support of the Engineer-in-Chief and the President of the Water Supply and Sewerage Board, agreed to substitute this system, the Secretary for Public Works wrote a business-like minute, for which I give him credit:

"Before approving this proposal, I should like an estimate of the actual value of the work to be carried out by the contractor under the substituted scheme."

That is a very wise minute. The hon. gentleman expressed a desire for schedule rates under the Monier system corresponding with those which had been furnished in the case of the ordinary sewerage works. One would have imagined that there would be no trouble in getting out that schedule; but the Engineer-in-Chief said:

"To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter & Gummow. This would take at least a week to do."

What did that slight loss of time matter when it would be two months before the contractors could start the contract? Why should not the quantities have been taken out? The sole reason was that quantities so much less would have been shown, and instead of the contractors making a profit of £2,000 they would have been cut down to a proper estimate of the value of the work.

"I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm, estimates were made for the work on the Monier system as well as on the department's designs. The result was that the estimate of both works was practically the same. Applying that comparison to this case, it would mean that the departmental estimate for the work under consideration would be £22,000."

You cannot make a comparison between two different public works of this kind. The duty of the head of the department when a Minister asked him for a further sheet of quantities was to make them out, and the Minister ought to have insisted upon that being done; but he said in effect that the engineer's reply was quite sufficient for him, and that he should approve of the recommendation of the Board being carried out. There is no reason why the head of the department should not have had a new estimate taken out for an entirely new piece of work. So much for the case of the Balmain sewerage works.—*Hansard*, 26th September, 1895.

#### 4. *With withholding the proper information concerning the above transaction from Parliament, by not laying plans and other papers upon the Table of the House when ordered to do so by Parliament.*

In connection with Contract 77, forty-one pages of useless matter has been stowed in, being blank schedule forms issued by the office, while the sheet of comparative tenders is withdrawn. No plan or figures are given concerning the Monier arch—that construction which was substituted for the Government scheme. That which was of so much importance, in order that we might be able to make a comparison, has been entirely removed from the records, and there is nothing to show what the quantities were, or what the nature of the work was, or anything about it.—*Hansard*, 12th May, 1896.

In considering the charges laid in relation to this Contract, the nature of the patent held by Carter, Gummow, & Co. is in the first place a material question. This patent, bearing date November 3, 1892, secures to the patentees in New South Wales, for fourteen years, the use of what is known as the Monier system, a peculiar mechanical association of iron and concrete, or cement mortar, whereby the high tensile strength of iron and the power of cement mixtures to resist crushing strains are very effectively combined. For many years it has been a common practice to imbed iron in the form of girders, bars, hoop-iron, &c., in concrete, with the object of strengthening the concrete body, and preventing its cracking after, or in, setting, through strains  
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due to unequal expansion or contraction. It has also been known that the adhesion between cement and iron, and therefore between these cement mixtures and iron, is very great, insomuch that the iron becomes in effect one body with the imbedding material; that iron so imbedded is absolutely protected from oxidation; and that the ratios of expansion and contraction, due to changes of temperature, of iron and of these cement mixtures are so nearly equal that the elasticity of the two is sufficient to compensate for the difference, so as to save the combined body from risk of fracture caused by stresses set up by variations, even very great, in the temperature of the whole; the comparatively low conducting power—for heat—of the cement mixture, even though only a thin layer of it covers the iron, saving the metal from the relatively too rapid change of bulk to which, if it were unprotected, its high conducting power would lead. But, though a knowledge of these facts, and a more or less erratic application of them in practice, formerly existed among engineers and the better instructed of architects and builders, they could not be said to be reduced to a regular system or in any true sense formulated till one Monier, of Paris, accidentally discovered the effectiveness of the mode of construction now known by his name. With the help of qualified engineers, his scheme was properly worked out and placed on a scientific basis; and its use was gradually extended till it included the building—most material in relation to the present subject—of bridges of considerable span and extraordinary lightness, and of constructions—such as aqueducts—for holding water: in fact tanks of large capacity were made in this way at a comparatively early stage in the development of the system. The peculiarity of Monier's plan is this: that the iron or steel is used—in the form of a lattice—in light bars laid parallel to one another imbedded in the cement mixture at intervals of a few inches, the position, in the structure, of these bars being so chosen that, while they are fully covered and protected by, and form one body with, the cement mixture, they lie as nearly as practicable in the theoretically best position to take, and resist, the tensile strains that are likely to result from the use to which the structure is intended to be put. Across these main bars, generally, but not necessarily, at right angles to them, are laid parallel to one another, at similarly short intervals, still lighter bars, the primary object of which is to equalise and distribute across the structure unequal tensile strains that may be imposed upon the main bars, so that they may more effectively relieve one another of irregularly imposed stresses. A comparatively trifling element in the Monier patent, as it appears to your Commissioner, notwithstanding the opinion of an expert to the contrary (p. 173 of the evidence), is that the two sets of bars are tied at their intersections, for convenience in construction, while the concrete or cement mortar is being placed and pressed into position. These ties thenceforth cease to operate, the adhesion of the cement mixture to the iron constituting the real connection between the bars, and, an overlap being provided sufficient to enable the adhesion of the cement to the iron to be an equivalent for the tensile strength of the bar itself, this adhesion constitutes a perfect joint between two lengths of bar, care being at the same time taken to so lay the bars as to break joint across the lattice work. The final result is, that a structure of great efficiency, in proportion to its weight and cost, is formed. The compressive strength, which is very high, up to 2,000 lb. to the square inch, of the cement mixture operates to resist the crushing strains; the tensile strength of the iron, added to that of the imbedding material immediately surrounding it, is applied in the most effective and most completely distributed manner; moreover, the intimate adhesion between the metal and the cement mixture, and the general distribution of the former, ensure the dispersion and relief by elasticity of stresses due to unequal contraction or expansion in the setting of the cement, and so prevent the cracking at intervals which is common in masses of concrete. The comparative smallness of the cross-section which the strength of the Monier system justifies also helps the elasticity, low though it be, of the cement mixture to operate to save rupture, by strains induced in setting, as well as by those afterwards due to variations of temperature.

In its primary aspect, this system of locating and counteracting tensile and compressive strains is applicable to a compound body of concrete and iron considered as a girder. The simplest case is that of a plate supported at each end, and bearing a vertical strain. In such a structure the main bars run longitudinally, and are placed near the lower surface. The vertical strain induces tension near the lower surface, resisted by the bars, and compression in the upper part of the plate, resisted by the body of cement mixture, and, whether the structure be straight or curved, the same principle

principle applies in fact. But its action in arches, in which relation it is most in question herein, is less simple than it is in structures of the girder form. An arch, considered as such, depends for its strength on the immobility of its piers, and on the compressive strength of its materials. Taking the abutments to be rigid, an arch, as such, is assumed to be so constructed that the resultant of all the strains imposed upon it at any point shall lie, as a compressive force, within the centre third of the arch ring, and shall act approximately in the line of the tangent, at that point, to the curve of the arch; and that the compressive strength of the materials composing the arch shall be at least a fair multiple—say 10—of the maximum strain to be borne at that point; 10 being then called the “factor of safety”:—it would be a very satisfactory factor. In an arch, as such, the principle of the girder is ignored: ability to withstand cross strains is not admitted. A well built arch of brick or stone laid in cement mortar is certainly a monolith in fact, and has the qualities of a girder to a great extent; but it is unsafe to allow this in calculation—the assumption may be negatived by an imperfect joint. The same principle applies to a concrete arch, though it may be in fact a true monolith; it is safe to trust only to compressive strength of material. And, in making calculations for a Monier arch, the principle is primarily the same. The arch should have a factor of safety of considerably more than one due to the compressive strength of its principal material, the cement mixture. But in this system the quality of a girder is effectively added to that of the true arch by the insertion of a curved lattice of iron bars near the lower surface—or “intrados”—of the arch, the main bars being laid longitudinally, and extending into the piers at the skewbacks or springings of the arch. By conferring great tensile strength in the intrados, this plan enables the arch to withstand a severe cross-strain imposed upon it at any point, acting downwards. And thus it gives the arch, as a whole, power to resist a general opening strain, so as to reduce the horizontal thrust on its abutments, while the vertical pressure at the springing, of course, remains the same. In addition to this, the iron adds to the compressive strength of the arch, considered simply as an arch, and not as a girder. In the case of a bridge, a load coming on to one end may cause at the other end a bending strain, tending to increase, instead of to flatten, the curve of the arch, and putting a tensile stress on the upper part of its section. To resist this, it is the practice to imbed, for a short distance from each springing, a lattice of iron bars close to the upper surface or extrados of the arch. In the case of the arch of an aqueduct, this lattice is unnecessary; no such strain can be imposed, as the flow of the water ensures a practically equal distribution of weight from pier to pier, the curve of the arch and the points of bearing of the aqueduct having been so designed as to ensure the absence of any tensile strain on the upper side of the arch, with a nearly equally distributed load.

A Monier arch being thus designed to resist strains which cannot safely be imposed upon an ordinary arch, may, although calculated to withstand, with a substantial factor of safety, the utmost stress which it is intended to bear, on the assumption that all imposed forces are resolved into compressive strains, may be reduced to a very great extent in bulk below what would be the safe minimum, if the iron bars had not been imbedded in it. It may be treated, in fact, as a monolithic arch, with an enormous reserve of strength in its relation of girder; and, not only by reason of the binding effect of the iron, but by its action in preventing the formation of cracks in the setting of the cement mixture, this form of arch seems, as nearly as is practicable, a perfect monolith; moreover, the lightness of structure thus made permissible gives an amount of elasticity which is of great service in safely compensating for expansion and contraction under changing conditions, and unequal distribution, of temperature.

In relation to the question, connected with the use of the Monier system in aqueducts, whether such a form of construction can be made watertight, it has been satisfactorily proved in evidence that, though concretes of various richnesses are more or less permeable by water—being more permeable the poorer they are—still, a well-made “rendering” or facing of one of cement to one of sand is recognised by experts as watertight. The principal risk of leakage lies in the cracking of the body of concrete on which the rendering is laid, thereby causing cracks in the rendering; this is less likely to occur when that body is a Monier plate than when it is a more solid, and therefore less elastic, mass of unbound concrete. And it has been proved that, when oozing does take place through concrete (probably through hair cracks),  
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the pores will soon get filled up, and the seepage will cease, especially where the permeating water contains sewage matter in suspension. Your Commissioner can also state from personal examination that a section of the carrier of the White's Bay Aqueduct (Contract 77) that had been bricked up at each end so as to convert it into a water-trough, and filled with water, and kept full for some weeks, up to the time of inspection, showed on the outside surface no sign whatever of percolation; in fact it was impossible from without to detect which section it was that had been so treated.

Mr. Baltzer, a draughtsman in the Sewerage Construction branch of the Works Department, a young man who had had a good training in engineering in Germany, became, through information received from his brother in Europe, strongly impressed with the value of the Monier system. Thinking it worth patenting in New South Wales, he communicated with Mr. Carter; the result was that the patent was applied for, and granted to Messrs. Carter, Snodgrass, and Baltzer. Though the date of registration is March 1, 1893, the letters patent bear date November 3, 1892, the day on which the application was made. About the time the Monier patent was under consideration, Mr. Baltzer was preparing a sort of treatise on the system, with illustrations. Appendix 57 is a copy of this. It was shown by Mr. Carter, after the granting of the patent, to various persons, among others to Mr. Hickson, who, as an engineer taking an interest in his profession, and with progressive ideas, naturally found a pleasure in investigating, and felt it his duty to examine into, so important a departure in engineering. He had already considered the Monier system before the taking out of the patent; but no doubt Mr. Baltzer's treatise directed his attention to it more particularly. Mr. Hickson was in possession of the treatise for some time; and the subject evidently impressed him strongly. Shortly after the registration of the patent, namely on April 3, 1893, Mr. Armstrong, as agent for the patentees, but, it would appear, acting without express instructions, under a misapprehension of his principals' actual wish—page 617 of evidence; question 18916—offered to sell the patent right to the Government for the sum of £1,500. Mr. Bagge, who was then Engineer-in-charge of Sewerage Construction, employed in the office, being asked to report on the offer, expressed himself strongly in favour of the Monier system, but doubted whether there was sufficient expert knowledge in the Colony to carry it out successfully. He also suggested that, if the patent did not differ from the Monier system—and no doubt it is identical—it would be free to public use, as it had been known in the Colony for some years. Mr. Hickson thereupon wrote a minute refusing to recommend the purchase, but suggesting that a small fee per bridge might be granted if it were intended to erect any others besides the small culvert which he said he had arranged to have built, as an experiment, without a patent fee. On page 33 of the Appendix, Mr. Bagge's report and Mr. Hickson's minute are set out in full. It would appear that it was after the taking out of the patent, but just before the offer of sale, that Mr. Carter lent Mr. Baltzer's book to Mr. Hickson; as Mr. Hickson had it for some considerable time, and was very busy, having to deal with a large number of contracts, the probability is that he had not carefully perused it before the minute of April 12, 1893, was written. After the writing of this minute he would have a better opportunity of studying the subject and becoming convinced of the merits of the Monier System. In May, 1894, the experimental culvert contemplated by Mr. Hickson was undertaken; it was begun about the end of June, and was completed about the end of July, under the general superintendence of Mr. W. A. Smith, District Engineer. It is situated at Strathfield, at the intersection of Wentworth Road with the Parramatta Road. Before the final completion of this culvert, but probably after the whole of the arch work was finished, and after part of it had by mistake been subjected to, and had successfully resisted, a very severe strain, which, in its then condition, it ought not to have been required to bear, Mr. Hickson wrote the following minute, which alludes to an offer, made in writing by Mr. Carter to Mr. W. A. Smith, and submitted by him to Mr. Hickson on his return from the country. It was first seen by Mr. Hickson on the 16th.

Divisional Engineer.—August, 1894.—Metropolitan Division.  
Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 18 July, 1894.

*Minute Paper.*

*Subject* :—“ Monier System of Concrete Arching.”

THE Monier system of concrete arching has been patented in the Colony by Messrs. Carter & Co. Where applicable, it reduces the cost of spanning an opening by about 50 per cent.

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The patentees are willing to allow the Department to use the patent on payment of a royalty of 15 per cent. on the cost of the arch. I recommend this for the Minister's approval.

I might state I have just completed (with the permission of the patentees) a culvert on the Parramatta Road, built on this principle, with most satisfactory results, financially and otherwise.

ROBT. HICKSON.

Mr. Hickson's recommendation approved.—J.H.Y., 6/8/94.

Divisional Engineer.—2 July, 9.—Metropolitan Division.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 2 February, 1894.

Sir,

Referring to our conversation *re* the use of our patent system of bridge and culvert building, we hereby inform you that the royalty we require for the use of the same by your Department will be 15 per cent. on the cost of construction.

We are, &c,  
CARTER & CO.

There is no doubt that Mr. Hickson, in saying that the use of the Monier system reduces the cost of spanning an opening by about 50 per cent., fairly expressed the result of his general inquiries into and consideration of the peculiarities of the system. There is also no doubt that the statement contained in the last paragraph of the minute was true throughout from Mr. Hickson's point of view, and true in fact as to the mechanical success of the experiment. Whether Mr. Hickson was not misled by Mr. Smith, upon whose report he relied, on the question of expense, is not so clear; but the conclusion to which your Commissioner has arrived on this point, on which there was an extraordinary conflict of testimony, is that, at any rate as to the cost of the arch itself, the words "with most satisfactory results financially" are, in fact, correct. As to the recommendation, this appears to be consistent with the suggestion made in Mr. Hickson's former minute of April, 1893, upon which no doubt Mr. Carter acted in his interview with Mr. Smith. Mr. Hickson carefully—the words "on the cost of the arch" being added in his handwriting to the type-written body of the minute—limits the 15 per cent. royalty in such a manner that no suggestion of *mala fides* can fairly be founded upon the circumstance that at the first blush the percentage seems a high one; and the Minister approved of the recommendation, which in no way bound the Department to use the Monier system, but merely recognised the validity of the patent and fixed the price at which it might be used if it should appear expedient to apply it in public works.

It follows from a consideration of the mode in which the Monier system had formulated and beneficially applied mechanical and chemical conclusions, arrived at before, but never systematically put into practice in that peculiarly effective way, that the original patentees were fully justified in their applications for the patent which had been actually granted in France and Germany. When Messrs. Carter, Snodgrass, and Baltzer, made their application, the Examiner of Patents at first declined to pass it, on the ground that it had been anticipated; but, it would appear rightly, he withdrew his objection on further explanation and consideration. The history of the granting of the patent appears in Appendix No. 18, page 47. It might be contended that the patent was invalidated by the fact known to and mentioned by Mr. Hickson, and insisted on by Mr. Bagge, that the system had been the subject of common knowledge for some years in New South Wales before the patent was applied for; but, seeing that the Examiner had recommended it, and the Governor had signed it after it had passed all proper investigation, and seeing also that Mr. Hickson was not a lawyer, it cannot in justice be said that he was showing undue favour to the patentees, because he waived; by his action—or, rather, suggested the waiver of—the doubtful chance of successfully resisting legal proceedings for infringement; only binding the Department to a charge that it might choose never to incur, while he had already declined to be a party to the paying away of the substantial sum of £1,500, for what, on scantier knowledge than that upon which he acted in writing his later minute, he thought might turn out to be useless to the Department.

It was about this same time that plans for an extension of the western outfall sewer had to be provided to carry the western suburbs sewerage over the Botany Sewage Farm. It was to be one contract of about 40 chains in length (No. 112), joining on to Contract 101, then in course of construction by Ahearne. As an improvement upon what appeared to Mr. Hickson to be the cumbersome and costly plans hitherto adopted, Mr. Bagge was instructed to make out



out new ones, to be submitted to Mr. Hickson. No doubt the discussion, of which the Monier system had formed a prominent feature, had led up to this idea of departing from the type of heavy brick archway with short spans, generally in use, and the substitution of some lighter form of concrete arch construction. Mr. Bagge, in his report dated September 21, 1894 (the first of the papers laid on the table of the House in accordance with promise given in answer to Question No. 11, Votes No. 249, October, 1895, and printed as Appendix No. 9 hereto, page 28) proposes three alternative schemes, the characteristic features of all of which are these:—"increasing the spans of arches, introducing arches with joints, constructing the whole of concrete, and constructing the whole of the work of concrete and mortar and iron." The first plan involves concrete arches of 50 feet span, with elastic asphalt joints over piers, spandrels with lozenge-shaped openings, and concrete carriers, strengthened by imbedded longitudinal iron bars, with an elastic joint over each pier. The second scheme is similar, but with lighter arches, and much lighter work in the carrier, which is strengthened by vertical iron bars, and longitudinal channel-irons, as well as longitudinal bars, imbedded in the walls, and transverse iron braces. The third scheme was on the Monier principle, with arches of 75 feet span, and much lighter work throughout, the haunches of each main arch carrying small spandrel arches, to support the carrier between the piers and the crown of the principal arch. The main arches were to contain a continuous iron lattice, imbedded three quarters of an inch above the intrados, and a similar lattice at the same distance below the extrados, extending for about 29 feet from each springing, the small arches containing only the lower lattice. The carrier was to have an expansion joint over each pier: it was to be constructed in Monier work throughout, with lattices in the walls and below the invert. The material was to be cement mortar—1 of cement to 3 of sand—except in the piers, which were to be built of bluestone concrete. In each case the main piers and footings were of similar construction, but varying in strength according to the weight to be borne.

The comparative estimate at the end of the report shows the respective cost per lineal foot of the three schemes to be £9 11s. 5d., £6 16s. 11<sup>3</sup>/<sub>4</sub>d., and £6 6s. 8<sup>3</sup>/<sub>4</sub>d. And the respective factors of safety appear as 8.7, 10, and 5.618. As to these, however, it is most important to consider that, in the calculating of the strength of the Monier arch, the effect of the iron lattice was omitted. 5.618 is the factor of safety due to the cement-mortar—commonly called *compo.*—alone. The addition of the iron makes so great a difference that it is safe to say that the arches in No. 3 scheme are really very much stronger than in No. 2. Mr. Bagge evidently had at this time a prejudice against—or it may perhaps be called a fear of—the Monier system, founded upon what appear to your Commissioner to be quite unreasonable grounds; and, on his recommendation, No. 2 scheme was selected for Contract 112, which was let in February, 1895.

Mr. Bagge, being aware that Mr. Baltzer had some knowledge of the Monier system, had entrusted to him the working out of No. 3 scheme. This work was done, of course, in the office. Having done it, Mr. Baltzer was in a position to work out similar plans, if required, for another purpose. Mr. Baltzer had, there can be no doubt, and still has, an unbounded faith in the system, added to his personal interest. As to whether it was proper for an officer in a Government department to be allowed to hold such an interest as this may be a debatable question. Your Commissioner, however, agrees with the opinion expressed by Mr. Hickson, that, in the case of a junior officer, it would be unfair and inexpedient to hamper the free action of his intellect, and check his professional ambition, by invidious restraint.

For some three or four years before tenders were called for Contract 77, for constructing a section of the sewer which will connect Balmain with the main system, having its outlet at Ben Buckler, plans had been prepared for the aqueducts forming part of this work. These aqueducts were to stand out in a peculiarly prominent position, crossing, at a considerable height, the hollows through which the gutters known as Johnstone's Creek and White's Creek respectively flow into Roselle Bay. The people of Forest Lodge, Annandale, Leichhardt, and Balmain, all had a certain interest in preventing a disfigurement of these depressions. Representations were made to the Department asking that ugly sewers should not be constructed. The result was that rather ornamental plans were drawn. But Mr. Hickson thought these too expensive. Various changes were made. Finally the work was cut down to the still fairly artistic scheme, consisting of comparatively light elliptical brick arches,

arches, generally of 48 feet span, and brick carrier, with sandstone string-course, the specification of which forms No. 1 of the appendix hereto, the elevation being also shown in the appendix.

Tenders for Contract 77 were invited for March 13, 1895. Meanwhile, the plans prepared in the office for No. 3 scheme for Contract 112 being useless, it struck the patentees that, if that scheme were modified to suit the aqueduct work to be done on Contract 77, that would afford a suitable occasion for applying the Monier system on a large scale. Mr. E. M. Clark, at Mr. Carter's request, waited with him upon the Minister for Works, Mr. Young. Mr. Carter requested the Minister to direct that, if the firm put in an alternative tender for No. 77 on the Monier principle, it might not be rejected as informal—that it might be considered. Mr. Young replied that he saw no objection to this: that the tender might be put in and might stand on its merits. Plans prepared by Mr. Baltzer, out of office hours, of which he made no secret, were ready—in fact barely ready in time—and were handed in on the same morning on which Carter, Gummow, & Co.'s tender, at  $28\frac{1}{2}$  per cent. below schedule rates, for the Departmental scheme, and the alternative tender on the Monier principle, were put into the tender-box. Mr. Carter had some difficulty in getting anyone to accept the plans. Ordinary tenders are, of course, unaccompanied by plans, being made out on the basis of those prepared and exhibited by the Department; under the circumstances of this tender, plans necessarily formed part of it. There is no provision made for putting in plans as part of a tender; they cannot go into the tender-box; hence the difficulty, to meet which no preparation had been made, though there is little doubt that it was generally expected by the officers of the Department that an alternative tender would be put in. Anticipating that there would be no chance, especially in the face of Mr. Bagge's known prejudice, of the acceptance of the alternative scheme unless they succeeded in making out the lowest tender for the departmental plans, Carter, Gummow, and Co., really Mr. Snodgrass, consulting to a certain extent with Mr. Gummow, tendered at a rate that they calculated would just enable them to do the work without loss. This proved equivalent to a reduction of  $28\frac{1}{2}$  per cent. below schedule rates, the percentage system being in force for Contract 77. The Department's schedule estimate for the whole work was £22,037 17s. 8d.; if  $28\frac{1}{2}$  per cent. be taken from this the remainder is £15,757 1s. 9d.\* The presumed cost of the work therefore on Carter, Gummow, and Co.'s tender was this amount. Their alternative tender on the Monier system was for a lump sum of £15,500. The next lowest tender was McSweeney's, at  $25\frac{1}{2}$  per cent. below schedule rates; the next Carson's, at  $20\frac{1}{10}$  below; eleven more followed in gradual decreasing reductions and increasing totals, till the highest was Spencer's, at 5 per cent. below schedule rates. McSweeney's works out at an apparent total (see note) of £16,418 4s. 6d., and Spencer's at £20,935 19s. 9d., showing, apart from the Department's estimate and Carter, Gummow & Co.'s tender, a difference of £4,517 15s. 3d. in the estimates made by two independent and presumably competent experts of the value of this work, the utmost limit of which may be set down at £22,000. This is by no means an extreme instance of the uncertainty of estimates; speculation as to the exact nature of the ground in the tunnels and in the foundations for the piers of the aqueducts may account largely for the great difference in the tenders; the arch and carrier work if tendered for alone might have called forth less diverging offers; but experience shows that, even where every item of a work is above ground, and certain in its nature, the most extraordinary variation will be found in tenders, the amount and price of labour required to do the work being one large element of uncertainty.

The tenders were referred to Mr. Bagge in the ordinary course; he reported against the acceptance of the Monier scheme—Appendix, page 31 (No. 2). His principal expressed objection was, as before, the fact that the work was a "specialty," implying want of confidence in the ability of Australian managers and workmen to carry it out properly.

This occurred in the middle of March; in April, Mr. Darley was to relieve Mr. Hickson as Engineer-in-Chief for Metropolitan Sewerage Construction. The next step in the history of this contract appears in the following report, which your  
Commissioner

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\* NOTE.—In carrying out an item of £4 in the addition of the schedule items a mistake of £36 was made, 40 having been put down in the pounds column instead of 4. The correct total, therefore, is £22,001 17s. 8d., and the total of the tender should be £15,731 6s. 11d. This error was only discovered during the holding of the inquiry. It is really immaterial.



Commissioner finds to be a true account of what occurred, followed by the Minister's minute, and Mr. Hickson's reply :—

Report of Board of Reference.

Board of Reference.—Tenders for Contract No. 77, Main Northern Sewer, Annandale and Leichhardt Sections.

THE tenders for this work were submitted to the Board to-day. In doing so, Mr. Hickson pointed out that fifteen tenders had been received, the lowest being that of Carter, Gummow, & Co., at 28½ per cent. below schedule rates—amounting approximately to £15,757 1s. 9d. The same firm also submitted a lump sum tender for carrying out the work, according to a plan sent in by them, for a sum of £15,500. The plan submitted is for constructing the work on the "Monier" arch principle. This system has been extensively used during recent years on the Continent of Europe with successful results, and Mr. Hickson sees no reason why, under certain restrictions, the opportunity should not be taken to introduce the system in the public works of this Colony. The advantages claimed by the patentees are that works can be carried out at a much cheaper rate wherever this method of construction is used. Mr. Hickson said he had no doubt that the design submitted was thoroughly suitable and likely to be effective, and, as the main principles as regards size and inclination of sewer were as provided for in the Departmental design, he was prepared to recommend it; but, if it was decided to accept the tender, a short specification of the work should be included in the bond, and provision also made for the maintenance of the work by the contractors for a certain period after completion.

Mr. Hickson further said, that, as Mr. Darley would be the responsible officer for carrying out this work, he had gone into the matter very thoroughly with that gentleman, and Mr. Darley was quite prepared to endorse his views.

The Board, in view of the fact that Messrs. Darley and Hickson are satisfied that the principle is a sound one, and that the adoption of the plan will result in considerable economy, are prepared to endorse the recommendation of these gentlemen, and now submit the matter for the Minister's consideration.

J. BARLING,

Chairman.

C. W. DARLEY,

Engineer-in-Chief, Harbours and Rivers.

ROBERT HICKSON,

Commissioner for Roads.

H. DEANE,

Engineer-in-Chief, Railway Construction.

J. W. HOLLIMAN, Secretary,  
20 March, 1895.

W. L. VERNON,

Government Architect.

Submitted.—J.B., 27/3/95. Before approving of this proposal I should like an estimate of the actual value of the work to be carried out by the contractors under the substituted scheme.—J.H.Y., 27/3/95.—Mr. Hickson.—J.B., 28/3/95.

To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm, estimates were made for the work on the Monier system, as well as on the Department's designs. The result was that the estimate of both works was practically the same. Applying that comparison to this case, it would mean that the Departmental estimate for the work under consideration would be £22,000.—ROBERT HICKSON, 28/3/95. Under Secretary.

Submitted.—J. BARLING, 28/3/95. This is quite sufficient for me, and I now approve of the recommendation of the Board being carried out.—J.H.Y., 29/3/95. Accept.—D.C.McL. (*pro* U.S.), 29/3/95.

The question is whether this minute was made in good faith, or whether it was an untrue statement, made with the intention of misleading the Minister, and enabling the contractors to make an unfair profit out of this substitution of a scheme of their own for the departmental scheme.

The facts which may be taken as having been present to Mr. Hickson's mind at the time he wrote this minute are the real data upon which to found an answer to this question. A vast amount of evidence has been produced for the purpose of showing what would be the fair cost of the Monier work contained in the Contract; being given by experts, of course it varies enormously; the absolute value of work, its value relatively to that contained in the departmental scheme for the same aqueducts, and its value compared with that of the work in Contracts Nos. 101 and 112, these have all been gone into; such evidence could not be excluded, as it was more or less remotely material; but its value is generally very small, inasmuch as the working of Mr. Hickson's mind, with the facts probably and properly present to it on that day, March 28, 1895, when he replied to the Minister's minute, is what has to be sought out.

It is only as far as these conclusions and comparisons can be presumed to have been present to, or within the reach of, his mind that they can in any way bear upon the question in issue. Now the plans which Mr. Hickson alludes to in his minute

minute as having been prepared for the extension of the sewers on to the sewage farm were certainly those attached to Mr. Bagge's report already mentioned—No. 9 of Appendix, page 28. At the foot of the "Summary" at the end of the report are these words :—

|  | Cost per lin. ft. | Cost per lin. yd. |
|--|-------------------|-------------------|
| Mr. Ahearn's present outfall sewer, Contract No. 101, if calculated for two sewers of 6 feet diameter, would cost ... .. | £10 16 1          | £32 8 3           |

and in the first paragraph of the report—page 28—this comparison is explained by the reference to "two six-foot diameter outfall sewers." At the same time, it is quite likely that a careful reader of the report, keeping his attention fixed on the principal subject of comparison, that between the three suggested schemes, might fail to notice this further comparison between them and a distinct and very different work. To the writer that comparison was very important. To a stranger to sewerage aqueduct building it would be necessary, to give a basis of calculation of the economical aspect of the proposed schemes ; but to an Engineer with such a basis in his mind, the result of experience and special knowledge, it might be unnecessary, and so he might pass it over and forget its existence, if he had ever for a moment noticed it. Contract 101 is a heavy aqueduct, of concrete piers, brick arches of small span, with solid spandrels, and massive concrete superstructure, carrying three parallel sewers each of circular section 6 feet in diameter (section, therefore, 28·27 square feet). In the nature of its materials it is of inexpensive construction ; but the quantities used are very large, and the general character of the design may be described as cumbrous. It was originally intended to be banked up and hidden, a treatment for which its architectural features eminently fit it ; in the end the bank was omitted as unnecessary. At the end of this aqueduct, where Contract 112 begins, there is to be an off-take, of capacity equivalent to that of one of the three cylindrical sewers. No. 112 had, therefore, to carry the contents of two of these sewers only. For the purpose of comparison, inasmuch as he was making an estimate for an extension of No. 101, with two-thirds of its capacity, Mr. Bagge very naturally calculated the cost of an aqueduct similar to 101, but of the proportionally reduced size, and used this as a basis of comparison. This comparison, it will be seen, works out thus :—No. 101 reduced being taken as the standard 1, and No. 1 proposed scheme being neglected as immaterial, No. 2 works out approximately at ·63 ; and No. 3 (Monier), at ·59. So that while the Monier scheme appeared to be likely to cost nearly the same as No. 2, which had been applied to Contract 112, being only about one-twelfth less expensive, the cost of each of these proposed plans of construction came to less than two-thirds of that of an aqueduct similar to No. 101 ; and, if the departmental scheme for No. 77 was not less expensive than the aqueduct in No. 101, it would follow that Mr. Bagge's third scheme, on the Monier system, ought to be built for not more than two-thirds of the cost of such aqueducts as appear on the departmental plans for 77. Therefore, unless by the 5th of April Mr. Hickson had acquired further information, inasmuch as the fourth paragraph of his letter of that date (in reference to security) stated that, on Carter, Gummow, & Co.'s tender for the departmental scheme, the aqueduct work would come to £9,000, it would follow that, supposing he had these several data clearly in his mind, he might have concluded that the aqueducts constructed on the Monier plan would probably cost the contractors some £3,000 less than those built on the plans of the Department. If this were so, then his action in writing the minute would lay him open to grave suspicion. As to a comparison between the two schemes—the Monier aqueducts in No. 77 and Mr. Bagge's No. 3 scheme—it may on the whole be taken as if they were similar and proportionate when viewed generally without critical examination, though in fact there was a difference. On the one hand the lattice near the extrados of each arch provided in Mr. Bagge's scheme was omitted in the Monier scheme for No. 77 ; this would be a slight comparative cheapening of the latter. Moreover, Mr. Bagge's No. 3 scheme was worked out for an area of carrier of 56·54 square feet, while the aqueducts in No. 77 have a mean area of only about 12·5 square feet ; yet, on the other hand, the arches in the latter, as compared with the former, have actually been slightly increased in thickness, partly, as Mr. Baltzer explained, out of deference to popular prejudice, partly because the exposed position, the height, and the narrowness of the construction, rendered it necessary to provide an unusually large margin of strength to resist wind pressure.

The

The question how in fact the Departmental aqueducts in No. 77 compare with that in No. 101 has been gone into by two witnesses, thoroughly expert, and of unimpeachable integrity—Messieurs McCredie and Thompson. Their estimates of the price per foot run of an aqueduct with one carrier, sectional area 28·27 feet, built on the principle of No. 101, very nearly agree, and are so close to their estimates of the cost of the Departmental scheme for the aqueducts in No. 77 as to be—allowing for the necessary elasticity of all estimates—practically identical; from this it would follow that, inasmuch as the sectional area of the carrier of No. 77 is only, on an average of the two aqueducts over Johnstone's and White's Creeks, 12·5 feet, those aqueducts are more costly for a given carrying capacity than No. 101. Therefore, the facts appear to justify the conclusion of bad faith, on the assumption that they were clearly before Mr. Hickson's mind when he wrote the unfortunate and ill-advised minute under consideration. Everything, now critically examined, seems to point to the conclusion that he ought to have insisted on the taking out of quantities, as requested by the Minister. But, after hearing the witnesses, and carefully considering their evidence, your Commissioner has come to the conclusion that Mr. Hickson did not regard the data before him in the light in which they now appear. When examined on the real meaning and effect of Mr. Bagge's minute, Mr. Hickson appeared to your Commissioner to be really puzzled. He seemed never to have noticed, or, at any rate, to have fully grasped, the intention of the comparison between the three proposed schemes and Ahearn's contract; his attention appears to have dwelt almost entirely on a comparison between No. 2 and No. 3 of these three schemes, the difference between which—the cost being nearly as 12 to 11—was so small that Mr. Hickson, with his extensive experience of the vagueness and elasticity of estimates, would naturally, and apparently did, regard them as equal in expense. Then he seems to have had in his mind that No. 101—if he thought of it at all—was a wasteful and unnecessarily expensive, though ugly, piece of work, while the aqueducts in No. 77, which he had caused to be reduced in cost more than once, were, with their elliptical arches, saving material in the spandrels, and their general lightness, though graceful, and in fact ornamental, on the whole fairly inexpensive structures. And so he came to make, honestly, though, in your Commissioner's opinion, erroneously, the comparison of identity of cost between Mr. Bagge's No. 2 and No. 3 schemes, assuming that No. 2 was fairly comparable with the aqueduct work in the departmental plans for No. 77, and so concluding that, on the whole, the proposed Monier aqueducts would compare approximately in cost with the Departmental aqueducts in that Contract.

But it was contended, and with some show of reason, that Mr. Hickson's minute was also inconsistent with his former statement in his minute recommending the acceptance of the proposal for allowing royalty at 15 per cent., when he asserted that, in spanning an opening, the Monier system would generally effect a saving of 50 per cent. Mr. Hickson explained, in evidence, that, in a form of construction in which the full benefit of the system was gained, this was a fair expression of the truth. And indeed the data that Mr. Hickson had had an opportunity of perusing fully justified this statement. But, under the peculiar circumstances of the aqueduct, the saving would be very much less. In the first place, there were all the unfavourable conditions—the experimental nature of the work, with the heavy responsibility to be thrown on the contractors, and the probable cost of the guarantee—the fact that, to satisfy as well the hesitation of the department in accepting so novel a scheme, popular prejudice against what would certainly be called a risky experiment, if built any lighter, and the contractors themselves, to whom failure would be almost ruinous, the work was designed very much more massive than it really need be; and, moreover, there was the peculiarity already alluded to which made the application of the system less relatively advantageous in saving material. As put by Mr. Hickson and other witnesses, a broad road bridge hardly requires any calculation for lateral strength to resist wind pressure beyond what it necessarily has incidental to its vertical stability, while such structures as these aqueducts must be built with so much regard for resisting horizontal thrust as to compare in weight with brick and stone designs of the same carrying capacity very much less favourably than where strength in a vertical plane has practically alone to be considered. The 50 per cent. saving, therefore, hoped for under the best conditions could not be expected here. The truth, as your Commissioner finds it,

was

was this: Mr. Hickson had a firm belief in the new system; in the face of Mr. Bagge's steady opposition he was anxious to give it a fair trial; he knew that the plan proposed to be adopted was almost certain to be a success; he was satisfied that the result would be to give the country a structure at least as strong as that designed by the Department, more graceful in design, and probably more durable; he found that the cost would almost certainly be at least £257 less, and probably less by a larger sum, than it would be if, and when, No. 77 came to be finished at schedule rates as designed by the department; he was anxious not to lose this chance of putting into practice a new departure in engineering of which he was honestly and enthusiastically in favour, under conditions that ensured an almost absolute freedom from risk to the country. He knew how difficult, if not impracticable, it would be to call for tenders for work on the Monier principle, seeing that Carter, Gummow, & Co. held the patent; he must have known that in tendering at 28½ per cent. below Schedule rates, carefully made out by Mr. Bagge, the Contractors had cut their tender down to the very lowest possible limit, so that even if the Monier plans did work out somewhat cheaper than the departmental scheme, the Contractors' alternative tender must be a low one: if, under all these circumstances, Mr. Hickson possibly acted with less discretion or less careful reflection than he might have exercised, in opposing the taking out of quantities, his conduct was at least excusable, and appears to your Commissioner to be free from all suspicion of dishonesty or consciously unfair bias.

The various estimates of how much the alternative scheme ought to have cost, or how much it is costing, are interesting, but really have little bearing upon the question really in issue; they severally go to show that the Monier scheme ought to cost from £4,000 less than the departmental scheme up to something in excess of it; they are all more or less speculative—like tenders in general, which of course are estimates, and yet vary so remarkably. The most reliable, because they are those founded upon the best actual observation, come closest to the lump sum of £15,500, at which sum Mr. Gummow and Mr. Snodgrass have explained how, leaving a moderate margin for profit, they came to fix their tender—p. 647, Q. 19,598, p. 695, Q. 21,073. As to whether they really meant to carry out their first tender at 28½ per cent. below schedule rates, if the alternative tender was refused, your Commissioner is satisfied that they did intend to do so; the very slight evidence to the contrary is utterly unsubstantial. Your Commissioner does not consider it necessary to go in detail through the various estimates alluded to, except to point out where they are to be found in the evidence or Appendix.\*

For the purpose of showing Mr. Hickson's bad faith or incompetence in approving the use of concrete or compo. where a water-tight structure was required, a quantity of evidence was given as to Ahearn's Contract, No. 101. The expansion and contraction to which concrete, in common with all other known bodies, is subject, in changes of temperature, has undoubtedly affected this aqueduct. Contraction, in the exceptionally cold winter of 1895, first caused cracking, at intervals, of the main body of the superstructure. The fact that the upper part of the superstructure, from the horizontal diameters of the carriers upwards, being built of sandstone concrete, contracted more than the bluestone concrete, of which the lower part was built, aggravated probably by the greater fall of temperature in the upper part due to the high radiating power of the black asphalt roadway exposed to the clear winter sky, caused a series of short diagonal cracks in the sides of the carriers, and very noticeable parting on the outer faces of the superstructure, wherever the concrete work, as it progressed, was stepped back and then carried on again. Probably this would have been averted or reduced to a trifle, by the carrying out of the original idea of earthing up the aqueduct. If the carriers had been in use the flowing sewage would have had a great effect in equalising the temperature and preventing the contraction. As it is, your Commissioner is satisfied—see reports on page 509 of the evidence—that no serious consequences will ensue; a few slight repairs, and the action of the sewage, will probably prevent any serious leakage. If the use of the aqueduct begins in the summer, when expansion has closed the cracks, it may be hoped that the next winter will have very little effect in re-opening them. But a comparison between the rigid mass of concrete in No. 101, and the open elastic  
Monier

\* Evidence—W. Gilliver, p. 138: Professor Warren, p. 319: G. McCredie (amended report), p. 343: T. Williams, p. 361: B. Rhodes, p. 368: J. Davis, p. 506: T. Clymer, p. 532: G. Chamier, p. 548: F. M. Gummow, p. 639. Appendix 15, p. 39, G. McCredie's estimates: 17, p. 42, W. Thompson's.

Monier work, with its expansion joints, in 77, is absurd. A fall of temperature in these open arches and in the carriers might be expected to act, in a general way, thus :—the bow of the main arch would become shorter, and the crown would descend ; at the same time the carrier would, by radiation, and also by the equalising effect of the sewage in the lower part of it, contract more above than below ; this would tend to curve each section of the carrier so as to be concave on the upper line ; this curvature would work in with the flattening of the arch ; the expansion joints would allow for the movement of the carrier ; the elasticity of the very light spandrel arches would give compensation in the spandrels ; no serious fracture need be feared. Expansion would be counteracted in an exactly converse way. No. 77 may as well be compared with No. 101 as a racing sulky with a bullock dray. All the evidence given has also satisfied your Commissioner that the contractors have taken an earnest and intelligent interest in the question of construction and material, using everything of the very best, and sparing no expense to make the work successful. In spite of some remarkable evidence as to sand and its qualities, your Commissioner finds that the crushed sandstone used for the compo. and concrete is eminently suitable for the purpose.

It was originally intended that the carrier-walls, as well as the arches, should be built of compo. ; but, after a short section had been so constructed, Mr. Darley considered that for the carrier walls a very rich bluestone concrete, consisting of five parts of bluestone screenings, three of sand, and two of cement, would be better. This has been used since, the contractors freely assenting, though the cost of this concrete is greater than that of compo. Seeing that elasticity is especially essential in the arch work, and that it acts most beneficially in a material of uniform composition, the compo.—a more homogeneous body than concrete—is considered most appropriate for the arches.

As doubts have been raised of the value of the compo. used in the arches, it is proper to state that very successful experiments were made at Johnstone's Creek, before the aqueduct work was begun. Experimental arches were made of the same materials as those afterwards used in the aqueduct. They are very light in build ; their hardness and elasticity are most remarkable ; they are still to be seen on the southern side of the eastern end of the Johnstone's Bay aqueduct. And, before the question of Contract No. 77 arose, experiments had been made, with satisfactory results, both by the Department and the patentees, on Monier arches and plates ; so that, apart from European and American experience, and beyond that of the Monier culvert, the use of the system in the aqueducts, in so far as strength and solidity are concerned, was far from speculative.

In considering the general strength of the aqueducts, it must be borne in mind that, though the arches are calculated (Mr. Cutler's evidence, page 556, Q. 16865), to bear the weight of the carrier when full as if it were distributed over every point, in fact as if it had no power to hold itself up, yet really, constructed as it is with a continuous vertical lattice on each side, and another horizontal lattice under the invert, and with longitudinal imbedded channel irons in the lower corners of its cross section, connected by bars, also imbedded, the carrier forms an enormously strong girder, capable at least of holding itself up between the piers and the crown of each main arch, if not from pier to pier ; and also possessed of great lateral stability, the base of the carrier being very strong to resist horizontal pressure, and each side, with its imbedded lattice close to its outer face, having good power to resist a force imposed on the opposite side ; while the two sides are enabled to help each other in this relation by means of the compressive strength of the fixed Monier plates covering the carrier.

One objection that was raised by certain witnesses to the use of the system here was the assumed severity of the climate. This is absurd. The seasonal range of temperature in Australia is very much smaller than in places at similar distances from the sea in Europe. Near Sydney the diurnal range is also moderate. Extremes of heat in inland Europe run very near to the highest readings known in the neighbourhood of Sydney, and these last occur at rare intervals. On the other hand Sydney may be said to suffer from no extremes of cold. The position of the summer solstice of the south in the earth's orbit, and the relatively low latitude of Sydney, compared with even the south of Europe, give Sydney more and more effective radiated sun's heat than even Naples ; but a body of concrete would almost certainly rise to a higher temperature in July in Naples, than in January in Sydney, on account of the higher mean air temperature of summer in Naples ; in January in Naples it would certainly  
become

become much colder than in July here. The climates of inland Germany and France are more extreme than that of Southern Europe, and would try these aqueducts very much more than the climate of Sydney. The flow of sewage in the carrier will act as an effective equalizer of temperature; and, generally, the hotter the weather the larger the flow. In so many different ways were attempts made to discredit and stultify the department in relation to this work, and to shake the confidence of the public both in the management of the Sewerage Construction Branch and in the works that have been and are being carried out by it, that your Commissioner has felt it his duty to express these opinions, founded upon the evidence and on general knowledge accessible to all. What has been represented as dishonest, foolish, or inconsiderate, action appears to your Commissioner to have been honest, sensible, and well considered; and, although unforeseen failure may attend any human effort, your Commissioner believes that the chances of success in this particular scheme are very near to certainty. The balance of expert testimony is strongly in favour of the ample sufficiency of three years as a test of the permanence of the work.

The next question to be considered in dealing with Mr. Hickson's good faith is his action in relation to the sureties. In reporting on the tenders Mr. Bagge had drawn attention to the fact, that a substantial guarantee was required in Europe for the stability of these works. The Board of Reference had suggested that provision should be made for maintenance for a certain time after completion. When the Minister finally decided to accept the tender, very stringent terms were imposed—a contract for maintenance for three years after the expiration of the ordinary maintenance period of three months, with a bond by the contractors in the penal sum of £12,000, and two sureties in £6,000 each, to secure the removal of the Monier work during that term, if the engineer shall be dissatisfied with it, and the re-erecting of the aqueducts according to the original specification. The contractors demurred to these terms, and asked to be relieved of the necessity for finding sureties. Mr. Hickson reported on this request. The following report and minutes explain exactly what took place:—

The Engineer-in-Chief for Sewerage to The Under Secretary for Public Works.

*Minute Paper.*

Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 5 April, 1895.

THE accompanying letter of 4th April, 1895, from Messrs. Carter, Gummow, & Co., is a protest against the stringent supplementary specification prepared by Mr. Norrie, at my suggestion, with regard to the alteration in the design of Contract No. 77.

The last paragraph of this specification states:—“And the contractors shall enter into a bond with Her Majesty the Queen in the penal sum of £12,000, with two sufficient sureties in the penal sum of £6,000 each, to secure the removal of so much of the said works as shall have been constructed on the Monier system, &c., &c.”

The amount of £12,000 is the sum it would cost the Department, at Departmental rates, to renew that portion of this sewer which is built on the Monier system.

It is right, however, to say that the tendered rates for this portion of the work would only come to £9,000; but, prices being abnormally low, I think it is only right to put in a sum at which the Department really values the work.

Messrs. Carter and Gummow ask that their own “personal sureties for the amount named,” *i.e.*, £12,000 (an amount which they do not dispute), “should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work.”

They go on to say that they are “a firm of sound financial standing, well and favourably known to the Department as contractors.” This is quite true; they are a firm in which I have every confidence. They have done a great deal of work under me, and I can testify that their aim always has been to turn out the very best class of work possible. At the same time, misfortunes happen the very soundest firms of contractors, and the Department must look a little way into the future. Their own bond for £12,000 would be really of no use if they were unfortunate enough in the meantime to become bankrupt.

I think, therefore, it is right that the sureties should be insisted upon. They give the names of two men, Mr. George Forrest and Mr. James Gillan. From inquiries made I believe these men to be financially sound; and, I think, if their names were accepted as the sureties in the penal sum of £6,000 each, the Department would be secured as far as it is reasonably possible to be.

This work will be carried out under Mr. Darley, and I recommend that the whole of the papers be sent him to give his opinion thereon.

ROBT. HICKSON,  
Engineer-in-Chief for Public Works.

Mr. Darley for report.—J.B., 5/4/95. I concur with Mr. Hickson. I think in accepting a new patent of this kind, and adopting it on a large and costly contract, that the Department cannot be too careful in securing its position by leaving all the risk on the hands of the contractors and patentees. I therefore

therefore recommend that the personal names be required for further surety. The names mentioned may, I think, be accepted.—C.D., Engineer-in-Chief, Metropolitan Sewerage Construction, 8/4/95.

For Minister's approval as to course suggested in regard to sureties.—J. BARLING, Under Secretary for Public Works, 9/4/95. Approved.—J.H.Y., 10/4/95. Mr. Norrie.—J.N.O. P., 10/4/95.

Messrs. Forest and Gillan were at this time, and had been for some years—in fact, they are still—members of the firm of Carter, Gummow, & Co. The deed set out in Appendix No. 19, page 49, explains the terms of the partnership, Mr. Forrest having been a member of the firm of Carter & Co., and Mr. Gillan of the firm of Gummow & Gillan, which firms amalgamated on August 25, 1892.

It was as members of this firm carrying on contracts in South Australia that Mr. Hickson knew these two gentlemen. His evidence given before the Commission, on pp. 176, 177, explains this. Appendix No. 25, p. 57, which gives in a tabulated form a list of contracts held by the various combinations of persons connected with Carter, Gummow, & Co., shows that since the formation of that firm neither Mr. Forrest nor Mr. Gillan had actually joined as contractors with the Government in any contract. Whatever business relations persons may in fact have with one another, it is clear the department only recognises the contractors named in the contract. So many various combinations occur among the different contractors who from time to time carry out Government works that the mere fact that certain names have been associated at one time hardly leads to any presumption that their owners, years afterwards, stand in the relation of partners. At the end of 1893, Mr. Hickson appears to have been aware that, for the purpose of the Adelaide contract, Messrs. Forrest and Gillan were partners in the firm. It was as such that he formed a favourable opinion, on Mr. Kane's authority, of their commercial standing. He had never heard of their leaving the firm. On the other hand, he must have known that they were not principals in Contract No. 77. The circumstances might certainly have suggested an inquiry whether they were not continuing partners in the same contracting business. It would have been wiser to make such inquiry; but this seems not to have struck anyone concerned. The usual forms were gone through in the office; and no one thought of asking the important question: What, if any, is the business relationship between the contractors and the proposed sureties? To draw from these facts the conclusion that Mr. Hickson was unfairly favouring the contractors by intentionally allowing them to slip in as bondsmen their own partners, whose stability depended on that of the firm, and who, therefore, may, in the event of its bankruptcy, turn out to be worthless, would, under all the circumstances, be improper. At the same time your Commissioner would suggest that more care should be taken in determining the ability of sureties to answer to their bonds than appears to be exercised according to the usual practice of the department. No doubt the necessary inquiry is always invidious, but the practice of justifying bail in courts of law may be recommended as an example to Government Departments when they find it proper to rest the interests of the public on personal security. What, in fact, was the position of Messrs. Forrest and Gillan, what property in New South Wales, New Zealand, or elsewhere, they actually held, is so slightly material as to be unworthy of comment. It was their repute at the time that the department had to do with. It would have been well to find what property they were possessed of; the investigation not having been made, and the department being certainly ignorant of their actual position in that respect, neither Mr. Hickson nor anyone else concerned can be judged by reference to the value of their real or personal property, as it stands now or as it stood then.

The last charge under the head of Contract 77 has reference to the withholding of plans from Parliament. The order runs thus:—"Copies of all papers and correspondence in connection with the contracts of Messrs. Carter, Gummow, & Co., at Marrickville, Balmain, North Sydney, Johnston's Creek, and Stanmore, including the specification, schedule, &c., for original contracts, and for substituted ones, and all vouchers paid and details of same, and such other matter included in the transactions, from commencement to the present date." This order not only does not include, but impliedly excludes, plans. The general question of withholding papers has formerly been dealt with in this report.

On the whole, your Commissioner is of opinion that the charges laid under the head of Contract No. 77 have not been substantiated, either in the form and to the extent in which they are expressed by Mr. Parkes in the tabulated list or, more generally, in his speeches in Parliament.

CONTRACT



### CONTRACT 79 (NORTH SHORE).

1. *With improperly granting to Messrs. Carter, Gummow, & Co., without re-tendering, Contract 79, by which a loss was sustained by the Crown.*
2. *With allowing Messrs. Carter, Gummow, & Co. to manipulate the items in the schedule prepared by the department, so as to increase the profits of the contractors to the loss of the Crown.*

Now, let us take Contract 79—the North Shore contract. This contract was let to Carter and Gummow on a schedule in the same manner as the others—that is, they undertook to do what is called guttering and gadding work—that is manual labour, to the extent of 1,300 yards. If Honorable Members will turn to page 333, they will see that Carter, Gummow, & Co. in their schedule undertook to excavate 1,300 yards, at 63s. for manual labour. They then undertook to excavate 3,000 yards and 2,500 yards blasting work, which was to be done at 60s. and 78s. Other contractors estimated for the gadding work £6 and £7, but the estimate of Carter, Gummow, & Co., was 63s.; and for blasting they estimated at 78s., whilst other contractors estimated at about 60s. The Government substituted the blasting work for the manual labour, and by that means gave the contractors about £4,000 or £5,000. As Honorable Members go further down they will find that the firm were paid in excess £1,598 and £600, that is £2,198 altogether. This was paid for concrete to fill up defects, in spite of the understanding being that they should not be so paid.—*Hansard*, 12th May, 1896.

I have pointed out that the schedules have been adjusted so as to allow the contractors to blast, and that blasting has been the cause of all that defective work; and the workmen told me that in some cases the cavities left have been so great that a man could walk along them. This state of affairs ought to receive a severe check at the hands of the House. If I were to read everything that has taken place, as disclosed by the minutes, the House would be astonished at the looseness with which our Ministers administer the public funds. As regards Contract No. 79, there can be no doubt that if the same concession had been given to other contractors as to Carter, Gummow, & Co., as disclosed by the papers, the country would have been benefited to the extent of £10,000 on this job. Since I moved the adjournment of the House on the subject upon a former occasion, the Water and Sewerage Board have called for tenders for a third section. Two sections were given to Carter, Gummow, & Co. without tenders, but the third tender was accepted at 40 per cent. under the schedule prices of Carter, Gummow, & Co.'s contract. That is conclusive evidence of the concessions that have been given to these contractors.

Mr. McMILLAN: What interval of time elapsed?

Mr. PARKES: About four months.

Mr. McMILLAN: And what was the alteration in prices?

Mr. PARKES: I have pointed out to Honorable Members that blasting was substituted for manual labour in the excavations, and now I want to point out that all this has been done against the repeated protest of the residents of the district. There were letters constantly pointing it out. This contract was carried on during the nighttime, and one officer pointed out in his report that the work was not supervised during the nighttime. He says, "This work has been carried on at nighttime, when no supervision could be given."—*Hansard*, 12th May, 1896.

I will read the report of Mr. Bagge, who tried to save the department from entering upon that scheme of the Monier patent. Mr. Bagge points out where they were proposing to allow the contractors to substitute blasting for manual labour. He says:—

"Messrs. Carter, Gummow, & Co. have undoubtedly fixed their schedule prices speculatively to increase their profits on the contract as much as possible; and, if so, to the loss of the department." There is no doubt that there is evidence of what the officer says right through the job. If we look through the whole of the papers we shall find that these contractors have in every case received thousands of pounds, which, if the matter were tested under proper regulations, they could not claim from the State.—*Hansard*, 12th May, 1896.

Again, in the Contract No. 79, that old trick of subducts is played. These subducts are simply drains, which are put under the beds of the sewers where there may be waste rock or imperfect earth of any description. The object is to drain into each shaft any water which may accumulate, and which may damage the beds of the sewers. They are absolutely essential to the sewer, but if they are not put in it can never be found out afterwards that they were not put in. Messrs. Carter and Gummow estimated these subducts at £4 5s., whereas other contractors estimated them at £452 and £666. This is a nice state of affairs! It is fair to assume that Messrs. Carter and Gummow must have been told by the officers that the subducts need not be built. The whole of the schedule is treated in the same way. If the work had been carried out conscientiously by the department, on this job alone there would have been a saving of at least £10,000. If I had been the engineer who had had to settle this contract I should have had the work carried out in such a manner that the country would certainly have been saved £10,000.—*Hansard*, 12th May, 1896.

3. *With returning the cash security and the retention fund to the contractors, in violation of the contract agreement and to the advantage of the contractor, and hazarding the interests of the Crown.*

In another place the Engineer-in-Chief says, in answer to me, cash security of £4,000 was taken in the case of the North Shore contract. I will show by the papers directly that although a cash deposit of £4,000 was taken in this contract that cash deposit was returned to the contractors six months before the job was completed.—*Hansard*, 12th May, 1896.

The Minister, although a bond was accepted for £4,000 for the due completion of the work, and he ought to have kept back the retention money, six months before the job was certified for, and before it was completed, returned the whole of the bond money.

An HON. MEMBER: What security had he for the completion of the work?

Mr. PARKES: None.

Mr. YOUNG: Because the work was done.

Mr. PARKES: It was not done, and the contract said clearly that the money must be retained in hand three months after the certificate that the work was satisfactorily completed by the contractor. The retention money has been returned, and I want to produce an affidavit made by one of the workmen on this job to show what risks the Administration took in returning the bond money. That money might still be in hand to repair the damage disclosed in this affidavit; but the Government have returned it all, and have no remedy. This affidavit is sworn by a labourer who is still working for Carter, Gummow, & Co. He says:—

"I am a labourer on Contracts 79 and 79A, putting in brickwork and concrete as packing. From shaft No. 13 of Contract 79 the blasting has blown out large cavities from 4 feet to 4 feet 6 inches over the top of the brick lining, which under the contract should be tightly packed with cement, but which have not been packed with cement, except here and there where the rock comes close to the brickwork.

"To my own knowledge this defective work commences from 270 feet down stream from shaft 13 to 380 feet; and to my firm belief, from the conversation between myself and several others, the whole work is of a similarly defective nature; and in all the links in which I have worked none of the packing is done as required to specification." That document was sworn to, and cannot be refuted. The action of the Administration in giving up the cash bond, which no engineer, no business manager in any capacity, would have done, has left the Government with only one resource, namely, that of going to law with the contractors. If that this affidavit says is true, they have no remedy otherwise than the costly remedy of an action at law. Actions of that sort ought to condemn the Administration who allow them. Why should they take these risks? Everything is done as against the State.—*Hansard*, 12th May, 1896.



4. *With the discharging of Inspector Reid from the above contract for simply doing his duty in the interest of the Crown by insisting upon good work and material.*

Another clerk of works who was doing his duty, and who could tell the country a great deal if put under oath, discreetly says that he will not give any information unless he is put under oath. He is right in that. He will not give me information; but I have gathered sufficient to know that there is a very wrong state of affairs going on. This man has been dismissed. Why? Not because he has done anything wrong, but for quarrelling with the contractors' foreman because they would not supply good material. He tells me that he wants to get back into the department, and, having been a fool once, he does not want to be a fool a second time. Here is the report upon his case. He says:

"I beg to report that on several occasions I have had to complain about the time the sandstone concrete is mixed for packing brickwork in shafts. To-day two 20-foot mixings were made up at 2 p.m. at No. 5 shaft. This concrete will not be put down shaft for use till 5.30 p.m. I have instructed Connors (foreman), who has charge of this work, not to have the concrete mixed so long before being used. He states to me that he has to take his instructions from the firm. I saw Mr. Snodgrass last Friday, and complained to him about this matter, when he promised it should not be mixed until one hour before it is required to be used. I spoke to Reid (contractors' representative) to-day, and he states that they shall mix the concrete when convenient for themselves."

"Inspector Reid informs me that on Saturday last, 17th February, about 1 p.m., at No. 6 shaft, it required half mixing 10 feet of sandstone concrete to finish brickwork packing in shaft. Henderson, bricklayer working in shaft, was on mixing board, and started to assist labourer gauge the stone. Inspector Reid instructed Henderson to use the fork in place of shovel in filling gauge-box, as the stone, which is broken close to the mixing-board, is not free from refuse. Inspector Reid asked Henderson the second time to use fork. Henderson replied that it did not want forking. Connors, foreman, came on the scene, and said to Henderson, 'Go on; do not take any notice of him, he's only a damned big buck navy.'" The man was subjected to this insult for doing his duty, and doing his utmost to prevent the contractors from cheating the Government with bad material. What was the result? From the minutes you will see that he was taken from that job, and in a few months dismissed. The only reason is that he quarrelled with the contractors' foreman; but you must recollect that he quarrelled with the foreman in the interests of the country, to save the money of the country.—*Hansard*, 12th May, 1896.

5. *With improperly paying an account of £350 6s. 8d. to the contractors for removing material, which work they never performed.*
6. *With placing improperly to the account for payments on Contract 79 various items of payments for work done at Bondi.*
7. *With advancing, without sufficient security, the sums of money upon contract materials not in the possession of the Crown.*

#### CONTRACT 79.

The first charge under the head of this contract has already been considered in dealing with those which concern Contract 72. In the view of the matter taken by your Commissioner, the allegation that a loss was sustained by the Crown becomes immaterial. Possibly, if Bond and Hudson had carried out the contract at their schedule prices, the work as a whole would have been done more cheaply: possibly, if fresh tenders had been invited, one lower than that of Carter & Co. would have been accepted: possibly, if Carter & Co.'s claim on Contract 72 had been resisted, it might have been successfully opposed: but, if what honestly appeared to be the best course to adopt under the circumstances was taken, then no blame attaches to any officer of the department.

The second charge, "with allowing Messrs. Carter, Gummow, & Co. to manipulate the items in the schedule prepared by the department, so as to increase the profits of the contractors to the loss of the Crown," is founded on the fact that the contractors were allowed to take out nearly the whole of their rock excavation in shafts and tunnels by means of blasting, instead of by guttering and gadding. The cheaper, and by far the more expeditious, mode of excavating rock is by blasting. There were two methods of blasting approved by the department—in one, 4-inch charges of powder were used; in the other, 2-inch charges. The former was by far the more effective, and therefore more profitable for the contractor, unless he had a considerably higher price for the latter. In addition to these, for shaft excavation, there was gadding, or cutting away the rock with a short pick, without the use of powder, and, in soft ground, the usual pick-work. Blasting with 2-inch charges justified, of course, a higher price than that with 4-inch charges. It was occasionally prescribed for the sake of reducing the detonation and vibration in the neighbourhood of houses, and saving fracture of the surrounding country in some kinds of rock. But it was not satisfactory, by reason, as Mr. Davis explained, of the special supervision required to prevent the men from using the larger charges, which they could provide themselves with and slip in when the inspector's back was turned. In tunnels, the third mode of excavation was called "guttering and gadding." This consists of laboriously chipping away the rock with a short pick or gad: the work is very slow, progressing by inches where blasting would go forward by feet: it is very objectionable because of the terrible risk to the health, and indeed to the life, of the men engaged in it. Every blow of the gad on the hard face of "Hawkesbury sandstone" found about Sydney brings out a shower of fine angular particles of silica that the very best possible ventilation, blocked by the dead end of the tunnel, cannot remove in time to prevent their being breathed in by the miner, cramped up in a confined space—perhaps only 4 feet by 3—which his body almost fills, and working under such conditions of hardship and difficulty that the wearing of a respirator is an  
additional

additional source of discomfort that he can hardly be expected to submit to. The result is that the sharp and absolutely insoluble dust passes into his air passages and sets up an irritation that frequently degenerates into—or provides conditions for the development of—some form of phthisis, and the man soon dies or becomes a wreck. Mr. Carter had, and has, a very strong opinion on this subject; and, whether or not his own self-interest ran with his natural sympathy for his men, he was certainly moved by that opinion to object strongly to the use of guttering and gadding, wherever it could be avoided. Mr. Snodgrass, on page 692 of the evidence, Question 20941, deposed to the fact that there was shown to Mr. Hickson and Mr. Davis a list of the names of men who had died from the effects of guttering and gadding. The only use of the system is to save the noise, and the risk of injury to buildings and to the surrounding rock, likely to be caused by blasting; which, of course, with so small an outlet for the generated gases as a narrow tunnel affords, may be considerable; though, in Contract 79, the tunnels are generally so far below the surface, and the rock is so hard, that these objections apply in a less degree than in most cases of sewer excavation; moreover, the course of the sewer is not, as a rule, thickly inhabited.

Mr. Bagge was, perhaps, rather over-cautious, a feature in his character as an engineer that was very noticeable in his evidence, and was spoken to by Mr. Davis; and he had apportioned his quantities, in making up the schedule of Contract 79, in such a way as to give to the head of guttering and gadding, as well as to that of 2-inch charges of powder, quantities that Mr. Snodgrass saw were excessive. The clever way in which he filled in his prices has already been touched on. There appears to have been no question raised as to how the shafts were to be excavated, except in relation to the hours and conditions under which blasting was to go on; blasting with 4-inch charges was permitted, as of course. It was more profitable to the contractors, because the difference of price received by them, as between gadding and blasting in this way, being five shillings per cubic yard, was considerably less than the difference in cost would have been; it was also cheaper for the department by the five shillings, and it was very much more expeditious; so, as long as no harm was done, it was to the advantage of both parties to the contract to adopt the 4-inch mode of blasting; the 2-inch system would have cost the department only another shilling a yard, but it would have entailed more supervision; the contractors, on the other hand, would probably have made less out of it.

When, however, the tunnel excavation was to begin, a question arose how it was to be carried out. The correspondence appears on page 139 of the Appendix. An explanation, however, is required to make this correspondence intelligible. The "lining" of a sewer, which is really the shell completely surrounding it, is composed of various materials. The section is oval, the longer diameter of the oval being vertical, and the circle of smallest radius being in the "invert" or bottom of the sewer. In solid rock the usual construction is this: the lower lining, up to a point rather more than half-way from the invert to the crown, consists of bluestone concrete not less than  $4\frac{1}{2}$  inches thick; the upper curve is a brick arch, of one ring of radiated bricks (shaped like the "voussoirs" of an arch) laid longitudinally in cement mortar; it is, therefore, of the same thickness— $4\frac{1}{2}$  inches—as the lower part. Any space there might be—beyond a mere joint, to be filled with mortar—between the lining and the rock was packed with sandstone concrete. When the rock is removed by guttering and gadding, it can be, and is supposed to be, taken out to the exact dimensions required for the lining: in every case (except where soft ground requires timbering, when a special allowance is made for the space taken up by the timber) no excavation is paid for beyond these dimensions. But, where blasting is adopted in tunnels, it was the practice to make an allowance—not in the payment for excavation, but of a thickness of 4 inches in the concrete—if, and so far as, the measurements known as cross-sections, taken before the lining was put in, justified it, to compensate the contractor, to some extent, for the sandstone concrete that would be used in the upper part, and the excess of bluestone in the lower, in filling the inequalities and irregularities incidental to excavation by blasting. Thus, in settling payment, the half-ring of bluestone concrete below would be increased by 4 inches in thickness, and a half-ring 4 inches thick of sandstone concrete would be allowed above. For this 4-inch ring, at the most, the department paid at schedule rates; the rest of the concrete, necessary to fill up  
excavation

excavation exceeding given measurement, had to be put in at the contractor's own cost. This practice—to pack the space over the brick ring with sandstone concrete, less expensive than bluestone—was in force when Contract 79 was carried out. The object of this packing was fourfold—1st, to increase the chance of the sewer's being watertight, by covering porous bricks or bad joints with a solid material; 2nd, to support the rock roof and prevent the risk of faults causing it to fall on and crush the sewer; 3rd, to strengthen the sewer, and enable it to resist a bursting strain, in the event of its being choked, or in case of explosions of gas; 4th, to prevent seepage in the rock from working a passage along the crown of the sewer, and so, finding ingress by open joints, overflowing the sewer and doing other damage. It is to be understood that sewers are not supposed to run more than two-thirds, or at the most three-quarters, full. Careful calculations are made to this end, and overflow outlets are provided to prevent such an accident as choking; but an extraordinary rainfall, aggravated in its effects by some accident causing a block, might upset the best calculations. In reference to the packing with shale, in one case on Contract 69, which has been alluded to, Mr. Davis, on page 665 of the evidence, Questions 20130 to 20138, has explained how it came about that packing with concrete was generally discontinued and sand was finally substituted, a practice with which Professor Warren is quite satisfied, though Mr. Bagge is very strongly in favour of concrete. No doubt it makes a stronger job, but expense is an important element in sewer construction; and, as long as all the joints of the brick arch are perfectly filled, sand probably answers the purpose quite as well as concrete, and, as it is cheap and easy to ram in, there is less risk of scamping with it, and leaving vacant spaces, than there is when concrete is supposed to be used.

If it had not been for this rule as to "margin" there could have been no question, on the basis of cost of the work, that blasting would have been the cheaper way of excavating the tunnels; cheaper to the department by only 3s. a yard on the schedule prices, but to the contractors by a very much larger sum. But Mr. Davis saw that the cost of the margin allowance of concrete would probably come to more than the saving in the price of excavation. He, therefore, directed Mr. Boys to make the elaborate calculations which appear on page 138 of the Appendix. It may be observed, to avoid confusion, that Mr. Boys has inadvertently used the expression "lining" instead of "packing" or "margin" in the first line. "Lining" properly means the concrete or brick wall of the sewer—the periphery of the barrel. It is the packing, an expression which will be found lower down in the calculations, which was in issue. From these calculations, which are no doubt accurate, Mr. Davis found—certainly correctly; a simple examination of the figures will prove this—that excavating the tunnel by guttering and gadding would cost about £1,250 less than it would by blasting. But if, instead of paying for the usual 4 inches margin of concrete, the department only paid for 2 inches, then Mr. Boys' calculations show that the saving would almost exactly balance the £1,250. Mr. Davis suggested such a compromise. Mr. Bagge endorsed it. The contractors were sent for. Mr. Hickson put it to them; and they were practically forced to consent. Mr. Carter said they always looked upon this as a very smart bit of dealing on the part of the department—in fact, that the contractors, being in a cleft stick, got the worst of the bargain. It certainly does not look like an act of favouritism. It has an exactly opposite appearance. In their letter agreeing to the arrangement—No. 28 of Appendix, page 58—they call attention to the fact that an error has been made as to one-eighth of an inch. Here the expression "lining" is used to express the whole thickness of—1st, measuring from the inside of sewer,  $\frac{5}{8}$ -inch of rendering; 2nd,  $4\frac{1}{2}$  inches of brick; 3rd, 2 inches of sandstone concrete packing—making altogether  $7\frac{1}{8}$  inches; or, in the lower half section,  $\frac{5}{8}$ -inch rendering,  $4\frac{1}{2}$  inches of bluestone concrete, and 2 inches of bluestone concrete margin. The bluestone concrete margin of measurement is, of course, placed in position in one body with the rest; the sandstone concrete over the arch is packed in from the open end at short intervals as the work proceeds.

Up to this stage, the modification made in the quantities was clearly a proper one, in which remarkable care was shown to secure the public interest; that it had the effect of increasing the contractors' profits was no reason for not adopting it: the result being that, while the department paid away no more money, the work was more expeditiously done, and the scandal—not to say the crime—of compelling men to risk their lives in guttering and gadding was avoided. The small amount

of this work actually done—21·22 yards, instead of 80·0—was presumably unavoidable. As it would appear from Mr. Davis's minute of 19th May, 1892, that he began by taking steps to enforce this dangerous system, through the whole length of tunnel, in assumed exercise of the right of substitution, it is fair to suggest that he, at the same time, knowing how averse from carrying it out the contractors were, contemplated just some such compromise as was afterwards arrived at. It is also proper here to comment on the absurd suggestion raised on the evidence of the witness Owen (page 179 of the evidence) that blasting is, with bad ventilation, as unhealthy work as guttering and gadding. Of course, some explosives cause deadly fumes that must be expelled before the men return. These are outside the question. Gunpowder has to be dealt with as the explosive contemplated in this contract. The nitrogen and carbon dioxide—the principal gaseous products of its combustion—are certainly poisonous, and should be blown away. The principal solid product—potassium sulphide—infinitesimally divided in the form of smoke, would probably have no injurious result. It is idle to compare the effect of these, and whatever other minute quantities of various compounds the explosion may produce, with the constant breathing in of sharp particles, of appreciable size, of absolutely refractory silica, nearly, if not quite, as bad as the notorious powder from glass grinding, and met with by the workman under much worse conditions. A question of ventilation cropped up in the course of the inquiry. It is very remote from the issue. All that need be said on the subject is this: that on the whole it would appear that the contractors took all usual measures to provide ventilation, according to Mr. Snodgrass's evidence on page 692, Q. 20942; but the men themselves failed to take advantage of them according to the usual practice, though it is quite possible that Manager Reid acted in this relation, probably without instructions, in a characteristically disagreeable way.

With reference to this John Reid, who was spoken of by several witnesses as a man who would do, and order to be done, bad work when he had an opportunity, your Commissioner is inclined to think that it would have been better if the officers of the Department had insisted on his removal while Contract 79 was being carried out. This, however, considering that he was undoubtedly an able manager, who thoroughly understood the details of the work of which he was in charge, would have been an extreme measure. It is quite possible that his natural infirmity of temper, partly the result of a complaint from which he suffered—asthma—and aggravated by occasional indulgence in strong drink, may have accounted for remarks, in the nature of admissions of dishonesty, attributed to him, made perhaps without any real meaning, and also for the dislike with which some of the witnesses evidently regarded him.

The next step in the history of the change in the mode of excavation in tunnels dates from more than fourteen months after the settling of the main question. It is disclosed in the letter of 10th August, 1893, No. 65 of *Appendix*, page 139, followed by Mr. Davis's minute, No. 66, with Mr. Bagge's note, passing it on without comment, and Mr. Hickson's minute of approval. Mr. Bagge's note should precede Mr. Hickson's minute instead of following it, as it is printed. The facts are so clearly set out in these documents and in the letter by Mr. Davis—*Appendix* No. 67, page 140—that it is unnecessary to repeat them here. Certainly a concession was made to the contractors which might have been refused; but it is coupled with a reservation, on the last paragraph but one of Mr. Davis's letter; and, on the whole, it is such a fair arrangement as, to the mind of any person viewing the matter in the light of common experience, unaffected by any foregone conclusions of partiality, would not suggest any such idea.

Your Commissioner therefore sees no ground for charging Mr. Hickson or any officer of the Department with allowing Messrs. Carter, Gummow, & Co. to "manipulate" the items in any way—the word manipulate being of course taken to mean improperly re-arrange, or to involve some such allegations of trickery.

The third charge under this head runs thus:—"With returning the cash security and the retention fund to the contractors, in violation of the contract agreement and to the advantage of the contractors, and hazarding the interests of the Crown."

The cash security lodged on this contract was, according to the usual scale, £2,000. It was in the form of a fixed deposit receipt given by the Bank of New Zealand. This receipt was renewed from time to time, the interest being paid to

Carter

Carter & Co.'s account. According to the terms of the contract, the work should have been completed on March 10, 1894. The "period of maintenance" was to be three calendar months from date of final certificate. The deposit was to be held as security until the period of maintenance had elapsed. On February 24, 1894, Mr. McLachlan, acting for Mr. Barling, wrote this minute to Mr. Hickson:—"The Bank fixed deposit receipt for £2,000, held in respect of the above contract, will mature on the 10th proximo. Should the deposit be renewed; and, if the security is to be returned, should it be handed to Messrs. Carter & Co.?" Mr. Hickson referred the minute to Mr. Davis. He wrote: "It will probably be two months before the whole of the works on this contract will be finished, after which there will be the three months' maintenance. The contractors might be asked if they wish to renew the deposit, (say) for another three months." Whereupon Mr. Hickson, on the same day, wrote: "Deposit should be renewed for three months." This would be till 10th June, 1894. On May 1, Carter & Co. asked for an extension for four months, on the ground of the additional work. This was granted as a matter of course, carrying on the time of completion to July 10, and the end of the maintenance period to October 10, 1894. Meanwhile, on March 29, 1894, the Minister had decided to give Carter & Co., on certain terms, Contract 79A, an extension of Contract 79 from Mount-street to Milson's Point. The amount of the cash deposit on this contract was to be £650. The date of formal acceptance of the tender was June 16, 1894. On June 9 Mr. McLachlan wrote: "The Bank fixed deposit receipt for £2,000 held in respect of the above contract will mature on the 10th instant. Should the deposit be returned; and, if the security is returnable, should it be handed to Carter & Co.?" Mr. Hickson's minute thereon runs thus:—"This deposit might be returned conditionally on Carter & Co. making a deposit of £650 on the extension of this contract." The Minister approved; the £650 was received; and the £2,000 was returned, some four months before the department was bound by the agreement to return it—in fact, shortly after the time at which it would presumably have been repaid if the contract time had not been extended. That there was nothing unusual or unprecedented in the fact that deposits were returned to contractors was proved by Mr. Davis on page 502 of the evidence. There is given a list of fifteen similar cases, in one of which, the Kiama to Nowra Railway, a sum of £10,000 was so returned. As Mr. Davis says, every case was considered on its own merits. Seeing that when the repayment was made the whole of the work on Contract 79 was practically finished, and that there was immediately put into the hands of the department a sum of £650 as security on the extension, and that it was fair to give the contractors every reasonable facility for moving their plant on to the new line and buying material, the merits of this case appear to be exceptionally in favour of the concession.

With regard to the retention money. The history of this transaction is contained in the following letters and minutes:—

Sir,

5, Spring-street, Sydney, 23 March, 1893.

Referring to contract now in course of construction by Messrs. Carter & Co., sewer construction, North Shore, I have the honor to direct your attention to the fact that the retention money now held by the Government is in excess of the amount originally lodged with tender, and that such amount is adequate security for the Government to ensure the just and proper fulfilment of the contract.

I have, therefore, on behalf of my clients, to apply for a return of the deposit of £2,000 held by the Crown.

I have, &c.,

W. ARMSTRONG,  
Agent for Carter & Co.

The Secretary for Public Works.

B.C. Mr. Hickson for report.—J.B., 23/3/93. Mr. Bagge.—F.C.P., 24/3/93. Mr. Davis.—C.H.O.B., 24/3/93. Report herewith.—J.D., 24/3/93.

*Minute Paper.*

*Subject*:—Contract No. 79, North Sydney Outfall Sewer.—Contractors ask that fixed deposit be returned.  
Department of Public Works, Roads and Bridges and Sewerage Branch,

Sydney, 24 March, 1893.

THE tender for this contract amounted to £39,890, of which £20,709 14s. worth of work has been executed, or about half the total quantity. The fixed deposit in all cases is held until the completion of the work, as a guarantee for the due fulfilment of the contract; and I do not think in this instance an exception should be made. On some occasions the Minister has approved of retention money being returned after the amount in hand, including the fixed deposit, has reached 10 per cent. of the amount of the tender; but, as much of the work remaining to be done is put down in the schedule of prices at very low rates, and the work finished, in some instances, at high rates, I could not recommend that any of the retention money be returned.

At

At present the department holds the following:—

|                        | £      | s. | d. |
|------------------------|--------|----|----|
| Fixed deposit ... ..   | 2,000  | 0  | 0  |
| Retention money ... .. | 2,070  | 19 | 5  |
|                        |        |    |    |
| Total ... ..           | £4,070 | 19 | 5  |

10 per cent. of tender would amount to ... .. £3,989 0 0

The Secretary for Public Works.

J. DAVIS.

For the approval of the Engineer-in-Chief.—C. H. OHLFSEN BAGGE, 25/3/93.

All that contractors would be entitled to if the new general conditions were in force would be £70 19s. 5d. As these are not yet in force, and contractors have good prices for work done, whereas work to be done is put down at low figures, I cannot recommend that their application be granted.—R.H., 25/3/93. Under Secretary.

List to refuse.—J.B., 27/3/93. Approved by Minister, W.J.L., order No. 867.—D. M'L., 11/4/93. J.B. Roads, B.C., 12/4/93. Seen.—J.D., 14/4/93. Armstrong informed, 17/4/93.

Sir,

Public Works Department, Sewerage Branch, 17 April, 1893.

In reply to your letter of 25th ult., applying, on behalf of Messrs. Carter & Co., for return of deposit money on contract money No. 79, North Shore Sewerage, I have the honor to inform you that it is a rule of this department to hold the "fixed deposit" until the contract is finished, and in this case no exception can be made. Moreover, as the "fixed deposit" and retention money do not amount to more than 10 per cent. of the tender, at present no portion of the retention money can be returned.

I have, &c.,

ROBERT HICKSON,

Engineer-in-Chief for Sewerage.

The Agent for Messrs. Carter & Co.

Sir,

5, Spring-street, Sydney, 21 April, 1893.

I have the honor to ask reconsideration of your refusal to allow a return of part of the retention money held on account of Contract No. 79, North Shore Sewerage, and to point out that, in addition to deposit of £2,000, retention money now amounts to £2,000, and that Messrs. Carter have plant and machinery on the contract amounting to £3,500, and also materials to the value of £800, making a total of security value of upwards of £8,000.

I respectfully submit that the Department will hold very ample security after a deduction of £2,000 from the retention money.

I have, &c.,

W. ARMSTRONG.

The Secretary for Public Works.

Mr. Hickson—D.C.M'L. (*pro* U.S.), B.C., 21/4/93. Mr. Davis, 21/4/23. Please attach previous papers.—J.D., 21/4/93. Papers herewith.—F.C.P., 22/4/93. A voucher has been signed to-day for work done amounting to £1,453 9s.—R.H., 27/4/93.

Sir,

North Sydney, 28 December, 1893.

Our tender for contract No. 69, Western Suburbs Sewerage, having been accepted with the provision that payment shall be made for the same in funded stock, a condition to which we have agreed, we have to ask you to be good enough to assist us in our financial arrangements by paying the retention money (£2,000) held on contract No. 79, North Sydney Sewerage, on our next progress certificate for the same.

The balance of the work to be completed on this contract will not exceed £4,000, against which you have our fixed deposit for £2,000 as security.

We find that some trouble will be experienced in making satisfactory arrangements for the disposal of the stock which will be paid to us during the first few months, and we therefore hope that you will be good enough to grant our request.

We are, &c.,

CARTER & CO.

The Engineer-in-Chief for Sewerage.

There is about £4,000 worth of work yet to be done to complete the contract, and as the Department holds a fixed deposit of £2,000, in addition to £1,988 19s. 7d., retention money, and as I consider the fixed deposit is sufficient to ensure the due completion of the contract, I recommend that the retention money, amounting to £1,988 19s. 7d., be returned to the contractors.—J.D., 3/1/94. Commissioner-in-Chief for Roads, Bridges, and Sewerage.

Recommended. These contractors have taken up the eastern branch extension sewer. £46,000 payment to be made in funded stock. Every consideration, therefore, should be shown to men who thus show their willingness to meet the Department.—R.H., 4/1/94. Under Secretary.

For approval.—J.B., 4/1/94. Approved.—W.J.L., 5/1/94. Mr. Hickson,—J.B., 5/4/94. Seen.—R.H., 5/1/94. Noted.—J.D., 5/1/94. Accountant. Noted voucher to Treasury this day.—O.C. (*per* E.H.), 8/1/94.

These papers do not quite clearly express the full history of the matter. Mr. Christie, on page 295 of the evidence, in his last memo. on that page, has called attention to Mr. Hickson's minute on Mr. Armstrong's letter of April 21, 1893, as not disclosing the fact that, in the sum of £1,453 9s., for which a voucher had been signed on that day, April 27, 1893, a portion of the retention money,

£222

£222 17s. 7d., had been returned ; or, in other words, that amount, which, according to the letter of the agreement, might have been retained, had not been so, partly kept included in, and partly added to, the retention money. Then, taking Mr. Christie's tabulated statement on page 296 of the evidence, it is quite clear that what followed was this : that from that time forth the amount of retention money, being allowed continually to stand at £1,989, was so estimated as to conform with the concession said to have been approved on some occasions alluded to in Mr. Davis's minute of March 24, 1893, viz., that, when the retention money and deposit added together became equal to 10 per cent. of the amount of the tender, the excess of the retention money should be returned—that is, that no more should be deducted from the amount on vouchers. As Mr. Davis pointed out, £3,989 was 10 per cent. of the tender amount. The deposit was £2,000; therefore, £1,989 was, under the practice mentioned, the limit beyond which retention money might cease. £1,989 was the actual amount retained on each occasion—an unvarying sum—from 27th April. Consequently, although the papers do not disclose the steps by which this system came to be adopted, it is clear that it was taken as legitimate, and carried out in conformity with Mr. Davis's minute. Seeing that what Mr. Armstrong had asked for was a return of the whole deposit, £2,000, and that it was that request that Mr. Hickson had reported against, Mr. Hickson's action in allowing only a concession of the excess of retention money over a total sum, including the £2,000, of £3,989, can hardly be said, as Mr. Christie puts it, to be at variance with his minute of a month before. In his second application, of 21st April, Mr. Armstrong had put his case more strongly. As Mr. Hickson's minute, commented on by Mr. Christie, bears date six days later, it is probable that in the meanwhile the matter was looked up, and the limited concession was made.

Mr. Davis has explained the matter in various parts of his evidence. A special clause of the new general conditions for contracts was passed by the Board of Reference as early as December 28, 1891, though the whole body of new general conditions was not formally approved till February 4, 1894. This is the clause which is found in Contract 69 and later contracts, providing that progress payments shall be made at the rate of 80 per cent. on value of work done till the amount retained becomes equal to the amount of the deposit, viz., 5 per cent. of the total (nominal or presumptive) value of the contract, and that then no more retention money shall be kept back—in other words, the retention money shall accrue at the rate of 20 per cent. till it amounts to 5 per cent. of the value of the contract, and shall then cease. Such a provision was not contained in Contract 79, which had been prepared before December 28, 1891. The condition for progress payments in that contract was that they should be at the rate of 90 per cent., with no limitation to the total amount of retention money, which thus accumulated at the rate of 10 per cent. As the new and very fair concession—due to Mr. Bruce Smith's broad-minded suggestions, when Minister—had been acted upon in drawing contracts from the time the clause was passed, it became customary—page 596, Q. 18089—to return, on contracts in the old form, the excess of retention money over the 5 per cent., and then to pay vouchers in full. This is how the £227 17s. 7d., excess of retention money, came to be returned. Mr. Davis's explanation on page 501, last paragraph, thus appears clear. When he says 5 per cent. only was kept back, he means that when 5 per cent. of the value of the contract was reached, 10 per cent. having in progress payments been kept back, the excess was returned and further retention ceased; the result being that 5 per cent. was finally retained as long as it was thought expedient to hold the retention money.

The return of the whole balance of the retention money in January, 1894, appears, on the face of it, to be a very reasonable concession. Holding a fixed deposit equal to 50 per cent. of the value of the work remaining to be done, the Department had such ample security that it was quite legitimate to concede, when the concession could safely be made, the power of handling cash to contractors who had agreed to accept payment for another large contract in stock. To keep the money still locked up, at a rate of interest hardly more than nominal, would, under the circumstances, seem a harsh and narrow-minded proceeding. Mr. Davis, on page 501 of the evidence, has, in the last paragraph but one on that page, given instances of similar concessions to other contractors. He speaks of the general practice in the preceding paragraph. In making these various concessions, it is admitted by the  
Department



Department that the contract was not always adhered to. The Department did not rigidly compel the contractors to comply with the strict letter of every clause; and, where they saw that latitude might fairly and safely be given, its officers treated the contract as elastic, without imperilling the rights of the Crown. And such action is evidently proper in the interests of the country. The less narrow and rigid, the more fair and considerate, is the treatment of contractors by the Department, the better content will they be with moderate profits, and the more fairly and harmoniously will the work be done, if only due care is taken to prevent dishonesty or carelessness on the part of contractors or their workmen.

As to this charge No. 2, therefore, your Commissioner is of opinion that the evidence does not support it, inasmuch as the concessions made cannot be said to be in violation of the contract, being within the fair spirit of its administration, and in that the interests of the Crown were not appreciably hazarded.

The fourth charge—"With the discharging of Inspector Reid from the above contract for simply doing his duty in the interest of the Crown by insisting upon good work and material"—deals with the transfer from Contract 79 of Inspector Reid. This inspector was employed to superintend, on behalf of the department, the sewer construction work on Contract 79. He had occasion, or thought he had occasion, to complain several times of the way in which the work was being done. He was finally removed to another contract at Lewisham. As he was then living at the North Shore, he felt aggrieved. Apparently he was doing his duty honestly and to the best of his ability. An inquiry had been held by Mr. Davis on the subject of one of his complaints. At the same time that Reid was transferred the contractors were required to remove two of their men. Reid's transfer was made the subject of consideration, and determined on. There was evidently a great deal of friction between the men and the inspector, much more than is usual; so much so that it seemed impossible for the work to go on satisfactorily. If this had been caused by the mere fact that he was determined to prevent them from doing bad work, it would have been proper to keep him on. In his place was sent an inspector, Eyre, supposed to be equally good, or better. Having heard the various opinions expressed of Reid by several witnesses, and having carefully observed his demeanour and listened to his evidence, your Commissioner has formed the opinion that, to a very large extent, the friction was caused by his peculiar manner and mode of carrying out his duties. There were probably also faults on the other side; but the conduct and tone of Reid were undoubtedly so irritating that, though in some cases he might happen to get through a job with fair success, the chances of his setting the men against him were very great. It was evident that the workmen on Contract 79 were in such a state of annoyance caused by his conduct at the time he was removed that his transfer was the best course for the department to take; and, in acting as they did, your Commissioner thinks that both Mr. Hickson and Mr. Davis took what they honestly thought the best course under the circumstances.

The fifth charge—"With improperly paying an account of £350 6s. 8d. to the contractors for removing material, which work they never performed"—has been withdrawn by Mr. Parkes. Your Commissioner agrees with the view he has taken of the evidence, and it is therefore unnecessary to allude further to this charge. The whole of the papers in connection with the matter are shown on pages 329 to 331 of the papers laid on the Table of the House in pursuance of the order of October 10, 1895.

As to charge No. 6—"With placing improperly to the account for payments on Contract 79 various items of payments for work done at Bondi"—Mr. Parkes expressed, impliedly, the opinion that, as evidence on this inquiry, the facts were not worth comment. He wished it to stand, however, as he thought it was not right that moneys, to however small an amount, paid on one account should be placed to debit of another. A small sum—£11 1s.—became payable to Carter & Co. on account of some work done on a culvert at Bondi connected with the Sewerage Construction Branch. As Carter & Co. were carrying on Contract 79, and the department had to find plant somewhere, it was borrowed from Carter & Co., who also let the department have a few casks of cement at schedule rates. The cartage of the plant and the price of the cement made up the total. For convenience, these items were added to a voucher of Contract 79, the accounts to be adjusted afterwards. There seems to have been no irregularity worth mentioning, and there was certainly no dishonest intention, in this proceeding.



As to the last charge, No. 7—"With advancing, without sufficient security, the sums of money upon contract materials not in possession of the Crown,"—it has been the regular practice of the department to make advances to contractors on materials brought on to the ground. As an example of a condition of every contract, the first paragraph of clause 14 of the general conditions of Contract 79 thus provides:—"All approved materials, plant, and prepared work, brought upon the ground for use in or on the works shall be considered and shall be the property of Her Majesty the Queen until completion of contract."

Clause 5 of the general conditions provides for the land, possession of which shall be given by the Minister to the contractors. The principal "approved material" on every sewer construction contract is cement, which has to be approved by the Engineer after being subjected to a very rigorous test, conducted by an officer of the Works Department in the office in Phillip-street. Clause 20 of the specification deals with this. Bricks also, the quality of which is specified by clause 13, are an important form of material. As soon as the excavation work is sufficiently advanced to enable construction to begin, it is necessary for the contractors to have ready on the ground a large stock of these materials, to prevent any chance of delay; or of anticipated delay, which has a discouraging and retarding effect on workmen. On such a contract as 79, where some of the shafts are over 200 feet deep, and the average depth is great, very expensive plant had to be provided, said by Mr. Davis to be probably worth £3,000. Under these circumstances, and especially as the contractors had to begin by placing at fixed deposit a sum, for security, of £2,000, and as—until, as has been explained, it reached £1,989—there was deducted from their schedule price for work done 10 per cent. for retention money, it was not unreasonable that the department should make advances on their approved material to a substantial extent. Of course, as Mr. Parkes very forcibly contended, it is not the province of the Government to finance contractors; such help they should arrange to receive from other sources; nor should the Treasury be treated as a great loan institution for their benefit; but there is a fallacy in assuming that this is the position in which the action of the Works Department, in making these advances, places the country. The Government has in effect bought, not only all the material upon which advances are made, but all other approved material that is on the ground, payment for it to be made after it is put into the work, at a certain retention rate below, or, at a later stage of the contract, at, schedule prices; and, therefore, advances on material are only really in the nature of payment for goods sold at an earlier date than that on which the purchaser is compelled, by the letter of his agreement, to pay for them. If these payments should exceed the actual market value of the goods in respect of which they are nominally made, then they certainly would be in the nature of advances, and would be unjustifiable if made by an agent—the engineer—without the express consent of his principle—the people; but if, though the advances are nominally made on certain goods, the excess of value is really and beyond all doubt amply covered by the value of other goods of the vendor also purchased and not paid for, then, though the form of the transaction is open to objection, in its spirit and its essence it is free from blame.

It was the practice, in calling for tenders on the schedule system, to add, at the end of the list of items showing real probable quantities, a list of other items under the head "General," with nominal quantities—understood to be nominal. This was done for the purpose of fixing a price for these items, which might happen to be required. Among others is cement, per cask. The price attached to this item in the schedule for Contract 79 was 16s. This price was about 2s. over the market price—for quantities—in June, 1891, when the tender was made out; though, with the exception of Bond and Hudson and Taylor & Co., each of which firms fix the same price—18s.—all the other tenderers put down 20s.; all adding something, no doubt, to cover cartage. But, at the time advances on cement were made under Contract 79, the fair market value per cask, delivered on the work, was under 12s. Whatever the schedule price might be for small lots to be purchased from the contractor, if required—his price for cement used in construction being included in his prices for concrete, brickwork, and rendering, or "cement facing"—when the question of making advances on cement arose, then the value to be put upon the security would of course depend on the market price at the time, the schedule price being quite immaterial in this relation.

On August 3, 1893, the following agreement was entered into, minuted to the Engineer-in-Chief by the Clerk-in-Charge of Bonds and Contracts, Mr. Norrie.

*Minute Paper.*

*Subject* :—Main Outfall Sewer, North Sydney.

Bonds and Contract Branch, Department of Public Works, Sydney, 3 August, 1893.

MEMORANDUM herewith duly signed by the contractors, Messrs. Carter & Co., agreeing to repay advances made from time to time on material not on the contract site.

The original agreement is also sent herewith.

HAROLD F. NORRIE.

Seen.—R.H., 4/8/92. Mr. Davis to note.—F.C.P., 4/8/93. Noted.—J.D., 4/8/93.  
 Accountant to note.—F.C.P., 4/8/93. Noted.—O.C., 4/8/93. Final return forwarded to Treasury for payment this day. Bond 92-538 and agreement 93-974, attached herewith, may now be filed with the papers.—O.C. (*per* E.H.), 13/12/94.  
 The Engineer-in-Chief for Sewerage.

MEMORANDUM.

In consideration of the Minister for Public Works in and for the Colony of New South Wales advancing to us the sum of £1,360, and of any future advances to be made to us, we hereby agree to repay to the said Minister for Public Works the said sum of £1,360 and future advances, together with interest at the rate of £6 per centum per annum on such sums respectively from the date of advance on demand. And we hereby charge all moneys due or payable, or becoming due or payable, to us under a certain contract for the construction of the North Shore main outfall sewer from near Long Bay to Mount-street, in the said Colony, entered into by us with the Government of the said Colony, also all cement, building materials, and every other thing already used or to be used in connection with our said contract, with the repayment of the said sum of £1,360, and any future advances, and interest at the rate aforesaid. And we hereby undertake to give, whenever called upon to do so, a valid bill of sale to the said Minister for Public Works over the said cement, building materials, and every other thing used in connection with our said contract, now stored in our premises at Alfred-street, North Sydney, in the said Colony, or elsewhere, such bill of sale to contain a power of sale and such other powers, provisoes, and agreements, as the said Minister for Public Works may be advised. Also, further undertake to give immediate possession of same to the said Minister, or any person appointed by him for that purpose, whenever called upon to do so.

As witness our hands, at Sydney, this 3rd day of August, A.D. 1893.

Witness,—

HAROLD F. NORRIE, J.P.  
 H.F.N.; 3/8/93.

JOHN CARTER.  
 D. G. SNODGRASS.

It was explained in evidence, as the minute itself sets out, that the object of this memorandum was to cover the case of materials that might happen not to be actually on the ground, as provided for by the general conditions, and, therefore, as to which it might be contended that, though they were approved, the property in them had not passed to the Crown; it was evidently at the time that the first advance was made that this step was taken. It does not appear that any bill of sale was ever given by the contractors; it is to be inferred that no necessity for it arose. There is no evidence that any of the cement advanced on was stored outside of the contract site. This document was sent on to Mr. Hickson for his inspection. Whether the arrangement for an advance had been made in accordance with his instructions or not does not appear; it must be presumed that he gave authority; it would rather seem that the business was done as a matter of course. There is no evidence of Ministerial sanction for these advances. On page 366, however, of the Parliamentary papers, the following appear:—

*Minute Paper.*

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 26 July, 1894.

*Subject* :—Contract No. 79A, North Shore—Recommending that advance be made on approved cement.

THE contractors have asked that an advance be made on approved cement on this contract. It is usual for this to be done, and I recommend that the request be complied with to the extent of 75 per cent. of the amount of the fixed deposit (£485), at the rate of 75 per cent. of the value of the cement on the ground, on condition that the contractors sign the usual agreement. J. DAVIS.

Approved.—R.R.P.H., 26/7/94. Mr. Davis.—F.C.P., 26/7/94. Seen. Mr. Norrie for usual agreement.—J.D., 27/7/94. Who are the contractors, and where is the cement stored?—H.F.N.B., 27/7/94. Sewerage. The contractors are Carter & Co., and the shed is in Alfred-street, opposite to the Town Hall.—J.D., 30/7/94. Mr. Norrie. Memorandum herewith, duly signed and stamped. Original agreement also sent herewith.—H.F.N., 7/8/94. The Commissioner-in-Chief for Roads, Bridges, and Sewerage. Seen.—R.R.P.H., 8/8/94. Mr. Davis to note.—F.C.P., 8/8/94. Seen. Mr. Weeden to note.—J.D., 9/8/94. Noted.—S.H.W., 11/8/94. Accountant.—J.D., 15/8/94. Noted agreement placed with bond.—E.H., 16/8/94.

These are connected with Contract 79A. No Ministerial sanction appears here either, and in this case the whole course of the application is traced. In allusion

allusion to this matter, Mr. Davis, in his evidence on page 502—second paragraph of memo. No. 3—says there was no rule as to the extent to which advances were made. He goes on to explain the high rate at which they were allowed in Contract 79. Mr. Norrie, bond clerk, in his evidence on page 220, spoke of these advances as customary, formerly without any written undertaking. He prepared a form for the purpose. Whether there was any Ministerial sanction or not generally required he could not say; it would appear that there was not. He could not say how the sum of £1,360 came to be fixed; nor has this been explained. On page 615, Mr. Davis touches again on the question of Ministerial sanction for advances. He says it was not obtained in every case—"it was such a usual thing." The conditions of Contract 79 appear to have justified the advances from the point of view of actual security; but your Commissioner cannot approve—in itself, as proper or business-like—in fact, as even logical—the valuation, for the purpose of advancing on it, of cement at schedule rates, or—as appears to have been done—the extending of the advance to the full value of the cement, whether arrived at on that basis, or on the proper basis of market price. There appears to have been a certain amount of carelessness and looseness in these transactions which was hardly creditable to the Department. It may be observed that, according to Mr. Davis's same evidence, a somewhat stricter system was enforced on 79A. As Mr. Christie points out, on page 215 of the evidence, when the maximum advance of £2,160 was reached upon 2,700 casks, it exceeded their actual value, at 11s. 6d., by £607 10s. Whether there was at that time a further actual security in bricks on the ground does not appear. It must be taken that there was a very large value in plant, upon which the Crown might have exercised its right as owner under the contract. Still the advance in form was made upon cement, and should, to avoid possible risk and possible complications, have been kept well within the real value of the cement. Your Commissioner does not see any fair reason to infer favouritism or consciously improper action from these circumstances; but, as business arrangements, they are not to be approved.

On the whole, your Commissioner draws from the history of Contract 79 no conclusion adverse to the integrity of Mr. Hickson or any other officer of the Department.

#### CONTRACT 79a (NORTH SHORE).

1. *With inducing the Minister, on the plea of urgency, to let the above Contract 79A to Carter, Gummow, & Co. without tender, and upon departmental estimate, by which a loss is liable to be sustained by the Crown.*

After they had received the first contract the member for the district, no doubt with the best intentions and with the object of finding work for the unemployed, recommended that a certain extension should be carried out. The Engineer-in-Chief reported that as a matter of urgency certain extensions to the contract should be carried out along various streets. How is it possible that the work could have been urgent, seeing that the outlet into the ocean for the whole of the sewerage scheme has not even been taken in hand? Until the outlet had been completed, how could the urgency of constructing branch lines of sewerage arise? Without any contract tendering, without any preparation of plans, without an effort to save the country unnecessary expenditure, a contract of £35,000 was given to this firm without competition for this extension work. It is no wonder that the contractors of the city complain of this contract being given. In connection with this contract, I wish to point out that the Engineer-in-Chief, upon the 22nd March, 1894, wrote this minute:—

"There is no reason why this extension should not be gone on with at once. I cannot, however, see my way to recommend that it be carried out as an extension of the existing contract, which, at schedule rates, would amount to £16,307 17s. 8d., whereas the office estimate is £12,831 19s. 6d. The greater part of this difference lies in one item, 'excavations in shafts,' which in present contract, owing to their great depth, carries a very high price, namely, 78s. per cubic yard. This Messrs. Carter & Co. are prepared to reduce to 40s. per cubic yard, which would reduce the total cost to £13,700, or about £1,000 above the office estimate. I believe, however, if tenders were invited, we could get the work done under the office estimate.—R.R.P.H., 22/3/94."

It was about this time that Mr. Hickson, junior, became a member of the firm. I find this minute by the Engineer-in-Chief on the 29th of the same month:—

"Referring to the Minister's intimation this morning, that he was prepared to let Messrs. Carter & Co. carry out this work as an extension of their present contract, provided they agreed to do so for the departmental estimate of £12,831 19s. 6d., no claims whatsoever to be made for extras, and all payments to be made at the allowed schedules rates."

That means that they might be allowed as extras—

"I have had an interview with Mr. Carter, who is prepared, on the part of his firm, to comply with the Minister's decision. Submitted for formal approval.—R.R.P.H., 29/3/94."

This was on the 30th March, 1894. How sudden a change! It is not the Minister who has to do with this. The Minister is generally led by the head of the department; it does not matter whether it is the present or the last Minister. The heads of these departments ought to be above reproach. There ought to be the greatest possible check put upon them. When we see a rapid change like this in a minute in a few days, after a son of the gentleman concerned has taken office under the contractors, then there is some suspicion. It is impossible to make definite charges, but the case looks so grave that it ought to be filtered out in this House.

Mr. YOUNG: Does the hon. gentleman assert that the engagement of young Mr. Hickson took place in the meantime—during those two or three days?

Mr. V. PARKES: I believe it was during that time.

Mr. YOUNG: Does the hon. member assert that?

Mr. V. PARKES: I believe it was. This circumstance shows the imperative necessity of holding an inquiry into the system of letting out public contracts with the view of establishing some method of check of which the country would get the benefit.—*Hansard*, September 26th, 1895.

\* \* \* \* \*

2. *With*

2. *With advancing the sums of money of the moneys of the Crown to the contractors upon insufficient movable security, and in violation of the contract between the contractors and the Crown.*
3. *With failing to place upon the Table of the House the papers ordered by Parliament, by which Honorable Members might be misled as to the nature of the transactions.*
4. *With permitting defective work to be executed by the contractors, by which a loss is sustained by the Crown.*

1. The first of the charges made under the head of this contract—"With inducing the Minister, on the plea of urgency, to let the above Contract 79A to Carter, Gummow, & Co. without tender, and upon Departmental estimate, by which a loss is liable to be sustained by the Crown"—involves the history of the extension of Contract 79 from Mount-street to Milson's Point. When Contract 79 was approaching completion, Mr. E. M. Clark, M.P., wrote to the Under Secretary for Works the letter of March 6, 1894, which appears as No. 77 on page 184 of the Appendix (where are set out all the important papers connected with this matter) urging, on very good grounds, the extension of the work to Jeffrey-street. The matter was referred to Mr. Hickson, and by him for report to Mr. Bagge, who expressed an opinion that the second section of the work should be the "outlet works," and the third section, which might be carried out at the same time, the extension asked for, including some minor branches. He at the same time prepared an office estimate of the cost of the work, at the then ruling prices, and another at the schedule prices of Contract 79. The former came to £12,831 19s. 6d. and the latter to £16,307 17s. 8d. Mr. Hickson reported in favour of the carrying out of the work, but not as an extension of Contract 79. He pointed out the difference in the estimates on the two bases of schedule and office prices, and went on to say that the main difference lay in the high cost of excavation in shafts—in Contract 79—viz., 78s. per cubic yard (excavation in soft ground; and in hard rock by blasting with 4-inch charges), and that Carter & Co. were willing to reduce this to 40s., whereby the total cost would be brought down to £13,700. But, he continued, his belief was that, if tenders were invited, the department could get the work done at less than office prices. The Minister, Mr. Lyne, was inclined to go on with the extension. There was an interview at which the Minister, Mr. Clark, and Mr. Carter, were present. It was finally agreed that the work should be done by Carter & Co. for the amount of the office estimate—£12,831 19s. 6d.—as a lump sum; no claims whatsoever to be allowed for extras, and all progress payments to be made at the schedule rates shown in the office estimate. Mr. Lyne, in his evidence on page 262, Question 9224, gave his account of the transaction, and completely exonerated Mr. Hickson from any imputation of having attempted to influence him in favour of Carter & Co., the opposite being the fact. Mr. E. M. Clark's evidence on page 667, Question 20160, &c., is to the same effect. It would be a most strained conclusion to draw from such evidence that because Mr. Hickson did not further urge the opinion he had expressed, and try to convince the Minister that he was making a mistake—and there is nothing to show that he was not in fact acting for the best—Mr. Hickson was, therefore, actuated by feelings of undue favour to Carter & Co. The only reasonable inference is that he was acting in absolute good faith.

2. The question involved in this charge—"With advancing the sums of money of the moneys of the Crown to the contractors upon insufficient movable security, and in violation of the contract between the contractors and the Crown"—has been partly dealt with in considering the last charge under Contract 79. The minute paper has been set out on page lix of this Report. The following memorandum of agreement was made out and signed by the contractors:—

*Agreement.*

MEMORANDUM.

IN consideration of the Minister of Public Works in and for the Colony of New South Wales advancing to us the sum of £485, and of any future advances to be made to us, we hereby agree to repay to the said Minister for Public Works the said sum of £485 and future advances, together with interest at the rate of £6 per centum per annum on such sums respectively from date of advance, on demand. And we hereby charge all money due or payable, or becoming due or payable, to us under a certain contract for sewerage works, called or known as contract No. 79A, Sydney Sewerage Works, in the said Colony, entered into by us with the Government of the said Colony, with the repayment of the said sum of £485 and any future advances and interest at the rate aforesaid. And we acknowledge that we now hold all cement now stored in out shed in Alfred-street, opposite Town Hall, Sydney, in the said Colony, or elsewhere, and plant, materials, and every other thing already used or to be used in connection with or under the

the said contract, for and on behalf of the said Minister for Public Works, as representing the said Government. And also further undertake to give immediate possession of same to the said Minister, or any person appointed by him for that purpose, whenever called upon to do so.

As witness our hands, at Sydney, this 6th day of August, in the year of our Lord 1894,—

JOHN CARTER.

Witness to the signature of John Carter,—

HAROLD F. NORRIE, J.P.

D. G. SNODGRASS.

Witness,—W. BARNETT SMITH, J.P.

The sum of £485 was fixed as 75 per cent. of £650—or, rather, that proportion less £2 10s. It may be observed in this memorandum that Mr. Davis's intention expressed in his minute is overlooked. That minute recommends a fixed and a variable limit for advances, the fixed maximum being £485, the variable one being 75 per cent. of the market value of cement from time to time on the ground, the quantity varying from month to month as the cement was used in the work and fresh supplies came in. The memorandum, on the other hand, though it does not necessarily bear that construction, implies that a sum of £485 has actually been advanced, and that future advances may be made exceeding that sum; moreover, it omits all mention of the variable limit of 75 per cent. on the market value of cement; and it seems as if the advances afterwards made, seeing that they did frequently exceed the amount of £485, were so made under a mistaken impression of the meaning of the arrangement suggested by Mr. Davis. They also ignored the variable limit, being evidently made on the basis of 100 instead of 75 per cent. of the market value. They exceeded the fixed maximum on each of four occasions by the sum of £171, and on one occasion by £54. Exactly the same thing seems to have occurred in relation to Contract 79. In the memorandum touching advances on that contract, no doubt the sum of £1,360 was fixed upon some principle—it is 68 per cent. of the deposit of £2,000. In the amount of the advances it was much exceeded, on one occasion by the sum of £800. It would really seem as if on both occasions the memorandum misled the Resident Engineer in charge of the work; but all through there appears no reason for suggesting dishonesty, or for supposing that Mr. Hickson had any personal knowledge of the way in which these accounts were being kept on the progress vouchers. Unless he made special inquiries or gave special instructions as to how these were to be made out, he would have no actual cognizance of them. As far as the real sufficiency of the security went, the advances being kept within the market value of the cement, and the Crown having the power of seizing the plant and whatever other materials there might be on the ground, there was probably no risk in the course adopted. Still, as on Contract 79, there appears to have been a want of that strict business-like adherence to prescribed rules of action which should be enforced on every Government contract. Fair elasticity in the reading of specifications and in the construction of conditions is beneficial; but, when concessions, proper in themselves, are made, their terms should be religiously adhered to; to allow concessions on concessions is to introduce most dangerous laxity. The numbers of the vouchers upon which Mr. Davis's recommendation was exceeded in advances show that, when the management of the work passed into the hands of Mr. Smail, acting for Mr. Darley, in his absence, the excess was first reduced, and then disappeared.

3. This charge—"With failing to place upon the Table of the House the papers ordered by Parliament, by which Honorable Members might be misled as to the nature of the transactions"—has been dealt with in a general way already. The papers of any moment omitted from those relating to Contract 79A will be found mentioned in Mr. Christie's evidence on page 455, question 14397. They are set out in the Appendix No. 77, pages 188, 189, and 190; unfortunately, in printing these, the order of date has been transposed in some cases. Most of them consist of the ordinary complaints about blasting; there is one relating to an inquiry by workmen for their mate, who had disappeared with their money; the only important papers in relation to the financing of the contract are the contractors' letter of July 1, 1895, and the minutes thereon, on page 188; these disclose such very reasonable action on the part of the department that there could be no possible object in keeping them back. It will be observed that, when it was estimated that only £1,800 worth of work remained to be done, the payment asked for and made still left £1,167 19s. 6d. balance of contract money (lump sum) and cash deposit, added together, in the hands of the department, over and above the amount of such

such estimated value. As these last papers bear dates of several months later than the time when Mr. Hickson ceased to have any control of the contract, this fact may be taken both to explain their being missed in the making up of the papers for Parliament, and to show that there could have been no object on the part of Mr. Hickson in omitting them.

4. The evidence on this charge—"With permitting defective work to be done by the contractors, by which a loss is sustained by the Crown"—is necessarily twofold. In the first place, it is directed to the question whether or not bad work was in fact done; and secondly, if it was done, whether this was with the permission of the department, either express or tacit. To prove that bad work was done, the evidence again is classed under two distinct heads. One body of evidence is called to show that bad work was actually done, another to prove by inference that it must have been done. The whole of the evidence of bad work said to have been done under this contract relates to the use of cement; the object of the contractors being—as it has been suggested—to make unfair profits by using less than the proper quantity, in one or other of two ways, namely, either by mixing, in concrete or cement mortar, a smaller proportion of cement than that prescribed by the specification, or by using less concrete in the work than the quantity that should have been used and was actually paid for. The evidence called to show that bad work was in fact done is that of workmen and others who depose to having helped to do it, or to having seen others do it. The proof that less than the proper quantity of cement must have been used consists in a comparison between the amount of work involving the use of cement upon different contracts carried out by Carter & Co. or Carter, Gummow, & Co. within a certain period, and the number of casks which they appear to have bought for use on those contracts. This comparison rests upon a basis without which it could have no existence, namely, on the relation between the bulks of certain materials—firstly, the ratios of the bulks of concretes of various kinds, and, secondly, the ratios of the bulks of different classes of brickwork built in cement mortar, to the bulks of cement respectively used in each case.

As far as the immediate object of this inquiry is concerned, there are certain of the questions involved which, if decided in one way, would make it unnecessary to consider the others; but, inasmuch as your Commissioner has no power of ultimate decision, but is merely required to report and express an opinion on the evidence, it is necessary to deal with each and all of these matters; moreover, they are so involved and interwoven in the evidence that it would not be proper to take any one by itself, and, weighing by itself so much of the evidence as bears upon it alone, to attempt to segregate and settle it independently. The question also of defective work charged to have been allowed to be put in the works of Contract 69 will, so far as the use of cement is concerned, be dealt with, as well as the general question whether, throughout the contracts carried out by the contractors named in the Commission, there has been a deficiency in the use of cement.

The first question, whether bad work was actually done on Contract 79A, is, to a certain extent, conclusively proved. George Dawson, a labourer, the first witness called on the inquiry, was employed by Carter & Co. as a bricklayer's labourer on that contract. Part of his duty was to pack the space, varying in depth, between the brick arch of the sewer and the rock with sandstone concrete. This has to be done at short intervals, the length of packing put in at one time depending on the size of the space and the form of the rock, though the ordinary length is one "drum"—*i.e.*, the wooden centering used to support the brick arch in building: it is generally about 2ft. 9in. long. The concrete is put in with a shovel and rammed horizontally with a flat-ended wooden rammer till the space is filled up to the face of the brickwork. Dawson deposed to his having put in very defective work, large cavities being left over the brick arch, where the rock had been blown away—spaces which should have been filled tightly with concrete. He named especially the interval between shafts Nos. 12 and 13—No. 12 being at the intersection of Alfred and Mount Streets, 13 the next shaft to the south—as a place where a big cavity would be found, about five drums in length; and he gave, approximately, the position of this space. He said there were also, at intervals, spaces aggregating about 500 feet where similarly defective work had been done. An examination, made by Professor Warren, on behalf of the department, and Mr. M'Credie, on behalf of Mr. Parkes, disclosed the fact that, not far from the spot indicated by Dawson, there was such a cavity,



cavity, about 7 feet 6 inches long, 3 feet wide, and 1 foot deep. Mr. M'Credie made a further examination afterwards of the whole length of the sewer, from the end close to Milson's Point to near the northern extremity of Contract 79. On the former occasion the air was so bad and the conditions were so unfavourable that a more exhaustive test was out of the question. On this second examination Mr. M'Credie was provided with a truck to lie on; and though the arrangements were not luxurious—the sewer having a vertical diameter of 3 feet 3 inches, and a horizontal diameter of 2 feet 2 inches—Mr. M'Credie was able to arrive, by tapping, at a fairly satisfactory conclusion. The result was that, with one exception besides the place already discovered, he found all the work apparently good and sound, though with here and there a suspicion of a small cavity not worth breaking into; the test being the sound made by a hammer struck on the roof, the best test, though not quite conclusive, that was practicable. But, again, between the same two shafts, and not far from the place indicated by Dawson, there turned out to be another large unpacked length 9 feet long, with an average depth of 9 inches. After this Dawson persisted in saying that the largest cavity was still undiscovered. It is a curious fact that Dawson was working on this particular length in December, 1895, after Mr. Parkes's first speech in the House on the subject matter of this inquiry had become a common topic of conversation, that Dawson had apparently felt aggrieved a few months before at losing a fortnight's wages which he thought he ought to get, and that he had made threats—as to which he only gave a qualified denial—that he would make it hot for the Company, or some such expression. His avowed object in volunteering information to Mr. Parkes was a sense of duty to the public. He would not swear that he had received any specific instructions to do this bad work, but he said Carter & Co.'s manager (Reid) evidently approved of the saving of cement by any improper means, though the supplies were always ample, and indeed in excess of requirements. The bricklayer (Crawshaw) who worked with Dawson could hardly have been ignorant of what was going on. He, however, was not called; it did not appear that he could be found. Dawson's animus was further indicated by his describing the packing with shale instead of cement of the tunnel on Contract 69, with the evident intention of making this appear to be an act of dishonesty, when he must almost certainly have known, or could easily have ascertained, that it was duly authorised; and by his also trying to make it appear in his later evidence (page 182) that condemned bagged cement had been fraudulently put into casks, whereas it was—no doubt truly—explained, and he ought to have known, that this was simply the transfer, by permission, of passed cement (the bags containing which were too much damaged to stand carting) into casks openly used for the purpose. Taking all the facts together, it does seem by no means improbable that the leaving of these cavities was the result either, possibly, of Dawson's independent action, or, more probably, of a conspiracy between him and the bricklayer, with the idea of afterwards informing, and so having revenge, and gaining some reward which loomed in the future all the more grandly for its vagueness. Certainly the value of Dawson's evidence—which went also to general bad mixing of concrete—appears to your Commissioner to be infinitesimal.

No other witnesses spoke to bad work on Contract 79A; but the evidence of those who deposed to improper mixing of concrete on other contracts of the same contractors' is indirectly material to that particular contract, and directly to those others. William Darcus, a carpenter, whose examination appears on page 62, gave some evidence of bad mixing. His testimony has already been mentioned under the head of Contract 69; and reasons have been given for distrusting his accuracy. Wright, also a carpenter—his evidence begins on page 68—gave a similar, but vague, account. He also swore to the use of condemned cement. His most definite story was to the effect that the concrete put in the invert near the outlet of a storm-water sewer at Alexandria, Contract 61, was barely half the thickness that it should be. A very careful examination was made here, with the result that there appeared to be no shadow of truth in Wright's story. He was discharged years ago by Carter & Co., and evidently thought himself much aggrieved. In the face of the positive disproof of his accuracy in one important particular, it would be most unwise to attach weight to any other part of his evidence. It is very probable that Wright meant to tell the truth, but that his recollection has become confused. His imagining that everyone else was drunk on a certain occasion (Questions 2485–2534) may give a clue to this defect in his own memory.

Mr.

Mr. Chiene, a surveyor, whose evidence begins on page 129, and who was employed for about two years by Carter & Co., on Contracts 65 at the Glebe, 53 at Waverley, and 72 at Shea's Creek, said he never saw a gauge fairly mixed anywhere—that the blue metal and sand were always heaped up, and in plastering the cement was short in quantity. He said that, though it was not his duty to watch the mixing of concrete, he was absolutely certain that bad work was going on on these contracts. He said he never tried to look to see if it was so; but that Reid, manager for Carter & Co., was “everlastingly talking to” him about it. Mr. Chiene admitted that whatever bad work there was was done behind the backs of the inspectors. Considering the remarkably generous way in which this witness was treated by Mr. Carter, both on an occasion when he had to go to hospital on account of a tram accident, which occurred when he was not on duty in any sense, and after he had left the service, when he was making a collection for himself, it seems strange that he should give untrue testimony against the firm. On the other hand, there is evidence to suggest that his mind may have suffered from the accident. There is the account of his transactions with Mr. Eaton, in which, if the latter is telling the truth, Mr. Chiene showed a marked want of rectitude; and, generally, it cannot be said that implicit reliance should be placed on the evidence of this witness.

The next witness on this question was Melville, who had been an inspector, and had been dismissed on the ground that he had allowed bad work to be done. His evidence is on pages 247-9. It is principally of value to show that Reid, contractor's manager, being then under some of the contractors named in the Commission, was a man who had to be watched, and that Bandeen, another of the firm's employees, a very good workman, had to be checked when gauging cement; also that Mr. Gummow persisted in keeping on a man named Shellback after he had attempted to put in scandalously bad concrete. If anyone was to blame for this, it would seem to be Inspector Gledhill. Whatever action there may have been by the Engineer-in-Chief does not apparently concern Mr. Hickson, as the Hyde Park Contract, No. 30, bears date 30th June, 1887; he was appointed Engineer-in-Chief for Sewerage on 1st July, 1889. Melville's memory may or may not be accurate. He distinctly showed animus by his manner against both Mr. Davis and Mr. Gummow.

Green's evidence (page 430) is really hardly worth noticing. It goes to show that small stone, which, in the opinion of some witnesses, ought not to go into concrete, was allowed to be used for that purpose on Contract 72. Certainly sand and dirt should not be put in as part of what is supposed to be the stone. And the “historical piano-case” (a legend of the sewers), supposed to be buried in a sump somewhere, heard of vaguely by some witnesses but never seen by any, again came up in Green's evidence,—it may be allowed to pass with a few remarks. Piano-cases are used on works as tool-boxes. A piano-case whole, which is improbable, or the wreck of one, may—either dishonestly or as a joke of the workmen, or (the pieces of it) in a generally careless way—have been lowered or thrown down a sump and covered with concrete. Your Commissioner—especially after the result of the search to verify Wright's story—saw no ground for breaking up the inverts of sewers in use, at great expense and risk of irreparable damage and the propagation of typhoid, to hunt for these buried treasures of evidence. Even if the whole piano-case is in a sump under a solid roof of concrete, it is much better to leave it where at present it is doing no harm; and if the layers of stone that have been deposed to as forming the bottoms of other sumps are dishonestly doing their equally effective work on Contract 65, they certainly ought not to be disturbed.

William Caughey is the next witness on this point (page 444). He does not believe in the piano-case at all. That may be taken henceforth as permanently buried. But he says the concrete was “not too well” mixed. “The gauges were sometimes rather filled over, and sometimes a bit more was thrown in than ought to have been.” It was this witness who deposed to putting stone down two sumps at the foot of shafts No. 11 and 12 on the Glebe contract. It was done by order of one Humphreys—since dead—who was in charge, after hours, when the Inspector had left, the depth of stone being from 1 foot to 18 inches. This would, of course, effect a considerable saving of concrete; if, as is to be presumed, the whole measurement of the sump was paid for as concrete, there would be a substantial fraud in the substitution of stone of no value.



In addition to the evidence of these witnesses, Mr. Bagge gave evidence of an occurrence which is rather remote from the inquiry, as limited by the charges relied upon by Mr. Parkes, but still comes within the general scope of the Commission, and is doubtfully material to the question whether the firm was in the habit of doing defective concrete work. The evidence is to be found on pages 195, Q. 7206; 406, Q. 13134; 410, Q. 13211; 464, Q. 14657, &c., Q. 14700, &c. It is to the effect that some concrete arches on the Waverley contract—53—collapsed with their own weight. This was absolutely contradicted by Mr. Davis, who explained that what did take place was a piece of faulty brick laying—leaving the joints of the upper bricks in the arch open, and grouting them in afterwards, by permission or direction of the Inspector, who was consequently disrated. Mr. Davis's evidence, on page 460, clearly explains the matter. Mr. Bagge's recollection of the collapse of the arches was founded evidently upon a small substratum of fact—the settlement, to a trifling extent, of one end, or rather corner, of a concrete culvert which ran through one of the arches of the aqueduct under the bank of earth in which they were enclosed, and a slight cracking away of one end of the aqueduct from the sewer; this was afterwards explained. His idea also about the sand, said by him to have been found in the brickwork, was evidently another flight of imagination, without any intentional deceit, arising from the discovery of the grouting. Again there is no doubt that his story about the ogee curve in the sewer at Alexandria Park—page 465, Q. 14669, &c.—was almost equally inaccurate. Mr. Davis's evidence on page 468, Q. 14743, &c., touches on this matter.

In answer to these various witnesses, the contractors deposed that they always gave instructions to have the work properly done according to the specifications, and that they were not aware of any scamping or shortage in the use of cement, of which they generally had large stocks, and always sufficient, except on rare occasions when supplies unexpectedly ran out. John Reid, who was called by the Commission in the course of what may be described as the case for the prosecution—page 148—gave evidence to the same effect. He had been employed by Carter & Co. as manager on several contracts for about seven years, till he was discharged early in 1896, there being no longer sufficient work to justify his being retained. That, at least, was the ostensible ground. He had managed a contract at Woolloomooloo, the Glebe and Waverley contracts, and the two at North Shore. His only duty with regard to other contracts of Carter & Co. was to make up pay sheets; he had nothing to do with the management. He said he was ordered to carry out the work according to specification and plans, and certainly was not told to improperly save material. He contradicted Dawson's assertion that he had done bad work with his—Reid's—assent. Connors, foreman of bricklayers, also gave evidence to the same effect: he was not working with Dawson at the time the cavities were left. Both he and John Reid spoke very strongly of the extraordinary idea that Inspector Reid had of his duty. Connors may be taken as the more independent witness of the two, and certainly appeared to be speaking the truth. It was he who narrated the remarkable words said to have been used by Dawson, to be found on page 176, Q. 6503, which, if they were used—and it is hard to believe that they were invented by Connors—go a long way to support the suggestion that Dawson and Crawshaw conspired to leave the cavities found between shafts 12 and 13, Contract 79A.

It may be noticed as a very important point that all the witnesses—except Dawson, who tried to insinuate that Inspector Eyre, who followed Inspector Reid on Contract 79A, kept out of the way on purpose—say that whatever bad work there was was done behind the backs of the inspectors and engineers, though Chiene attempted to suggest that some of the inspectors were bribed by the contractors; but, even if this were so, all the evidence points to the same conclusion—that the responsible officers of the department exercised the utmost care in having the work on each contract supervised by a large number of inspectors, kept under the eye of the Resident Engineer, and liable to be dismissed, disrated, or reprimanded, for any neglect of duty.

It was principally this suggestion of bribery, and Chiene's admission of the extremely liberal way in which he was treated by Mr. Carter, coupled with the evidence touching the Resident Engineers, Rudolph, O'Hanlon, and Weedon, and their business transactions with Mr. Carter, that impressed your Commissioner with the importance of determining what the truth was in relation to the question of Mr. Carter's liberality

liberality and good nature. Your Commissioner, therefore, took the perhaps unusual course of publicly asking for evidence on this subject. The witnesses who came forward in response to this invitation deposed to such facts as leave no possibility of doubt that Mr. Carter is almost quixotic in his generosity when he meets with any case of pecuniary difficulty, hardship, or distress; and the same habit of action appears to have pervaded the firm generally. It is, as all Judges unfortunately know too well, a very easy matter to procure evidence in favour of a man's character, and very difficult—unless he happens to belong to some unpopular, because objectionable, class—to find out the truth of his shortcomings and misdeeds; but, though full weight be given to this consideration, it remains, on such evidence as was volunteered, absolutely beyond dispute that the conclusion arrived at in relation to Mr. Carter is correct. Therefore, when he is found helping men who might by some possibility—or even probably—be able to further his or his firm's interests, even if he is found almost forcing favours upon them, the inference that might with some men naturally be drawn, that he is acting with an object—that the transaction is in effect one of bribery—is so weakened as in all logical fairness to disappear. And this argument applies not only to the man who grants, but to him who receives, the favour. A man who, being in need of temporary help, is, in a generous, evidently disinterested, spirit, freely asked to accept a loan, and who does not force himself, almost churlishly, to refuse it, cannot justly be charged with taking a bribe because he is aware that it may be in his power to return the favour in breach of his duty to his employer. It would, perhaps, be wiser for him to decline, and say why he declines; but it would hardly strike some men, from the very fact of their unconsciousness of evil intention, that there could be any harm in the transaction.

In connection with this phase of Mr. Carter's character, it is abundantly proved that neither the firm of Carter & Co. nor that of Carter, Gummow, & Co. kept any regular business books. Taking the evidence throughout, it is quite clear that they considered—and found—that their bank pass-books were sufficient as between themselves. On page 116, Q. 4307, will be found Mr. Carter's explanation of how the partnership affairs were conducted. It was only after the amalgamation of the two firms of Carter & Co. and Gummow and Gillan that the firm began even to bind together the pay-sheets—page 117, Q. 4318. In their dealings with sub-contractors and workmen there appears to have been generally the same implicit confidence placed in the contractors as is implied, from the absence of books, in their mutual relations as partners. These facts are material in this way. Generosity and honesty do not necessarily go together; but, when men are proved to be generous, and when they are also proved—by strong implication—to be honorable in their dealings with one another, the presumption that their generosity is real and not assumed for interested purposes is strong. And, seeing also that the good faith of the firm is, in several different aspects, in issue in this inquiry, this evidence is important in many relations; though it must be borne in mind, for what that consideration is worth—especially in connection with Mr. Snodgrass's action—that admittedly the firm had drifted into adopting, perhaps with no consciousness of its involving any moral wrong, the very objectionable practice of "schedule-rigging" already commented on.

The evidence of Mr. Chiene in relation to the suggestion of bribery is really of little importance: it will be found on pages 130-31-33. It was a remark made by Manager Reid that suggested to Mr. Chiene's mind the idea that there might be something wrong in Mr. Carter's giving Mr. O'Hanlon what turned out to be a wedding present. The bribes supposed to have been given to Inspector Corpe seem to have been a charitable gift after his discharge, and, later, a contribution to his funeral expenses. Reid contradicted Chiene's evidence, in so far as it was suggestive of bribery; however, Reid was not always sober—a remark that applies also, it would appear, to Chiene—many things may have been said; many things may seem to be recollected.

Before touching on the questions of Messrs. Rudolph, O'Hanlon, and Weedon, it is fair to Mr. Parkes to mention that these transactions were discovered on an inspection by Mr. Christie of Mr. Carter's bank-books, and that Mr. Parkes was anxious, and endeavoured, to prevent the names of these officers from being made public, for fear of their suffering in their reputation and in their position in the Service; but circumstances made it impossible to avoid such publication.

A full account of the loan by Mr. Carter to Mr. Rudolph will be found in Mr. Carter's evidence, page 212, Q. 7683. Mr. Rudolph's history of the transaction begins on page 572. It is clear—1st, that Mr. Rudolph had ceased to supervise work for Carter & Co. at the time of the loan, and that he has not done so since; and, 2nd, that the money was lent by Mr. Carter personally, notwithstanding the inference drawn by Mr. Christie, page 232, Qs. 8328-9, satisfactorily explained away by Mr. Carter's account. It is also evident that Mr. Rudolph repaid it as soon as he possibly could. No suspicion of conscious impropriety, or of this obligation's having been a reward for services rendered, arises from the transaction.

On page 212, Q. 7683, Mr. Carter also gives an account of his loan to Resident-Engineer O'Hanlon, whose evidence will be found on page 596. From about the middle of 1890 to the date of the transaction, June, 1894, Mr. O'Hanlon had never had anything to do with any contracts of the firm. The whole of the money borrowed was repaid within four months. It was undoubtedly a private transaction; and it bears no more appearance of bribery than does Mr. Rudolph's loan.

The transaction with Mr. Weedon was described by Mr. Carter on page 210, Q. 7624, &c.: Mr. Weedon gives his account of it on page 244. The transaction was a loan of £2,000 by Mr. Weedon to Mr. Carter, at 6 per cent. interest, made as an investment of the money, when Mr. Weedon failed to find any other satisfactory place for it. In point of fact the money went into the account of the firm; this application of it being, naturally, the only use to which Mr. Carter could put it. There is no reason, however, to doubt the fact sworn to that the loan was intended as one to Mr. Carter personally—so far as that question is at all material. At the time the transaction took place—June, 1895—Mr. Weedon had nothing to do with any work of the firm's. He had been employed temporarily relieving Mr. Boys, on 79, and constantly on 79A; but from April 1, 1895, Mr. Darley—or Mr. Smail—took charge of that contract, so that Mr. Weedon had finally left it some months before the money was lent. Evidence was given—page 293—for the purpose of showing that the transaction was really with the firm, and that the security was insufficient; though it is rather difficult to discover the bearing on the subject-matter of the latter fact; however, as to that point, land values are, now especially, so notoriously uncertain that it may be passed over; the deduction naturally to be drawn from the facts proved is that the members of the partnership, for whom Mr. Carter was trustee as to some of the parcels, assented to the charging of the land, of which he held the fee-simple, for the very good reason that they shared in the advantage of the loan. There is really nothing like bribery in the whole of this affair.

Merely observing that it would be wiser for engineers and other Government officers to abstain religiously from having any business transactions of any kind whatever with contractors with whose works they may by any possibility be brought into official relation, your Commissioner leaves the subject of the dealings of these three gentlemen with Mr. Carter, with the earnest hope that the matters disclosed by the Inquiry may not, in the least degree, operate to their prejudice with their superior officers or the Public Service Board.

Taking together the whole of the evidence touching the subject of bad work, otherwise than such as may be inferred from the purchases of cement remaining to be dealt with, your Commissioner finds that it is not improbable that some such cases as have been described or suggested, of partly filling sumps or packing sewers with improper material in the place of concrete, leaving cavities over the crowns of sewers, using undue proportions of stone, sand, and cement, in mixing concrete, or in other ways "scamping" work, may have taken place in the contracts carried out by firms consisting of combinations of the persons named in the Commission, and that such acts may have been done in some cases by direction of the manager, but that the evidence to prove the commission of such acts is very limited, and generally very unsatisfactory; and, further, that there is no evidence worthy to be considered to prove that any such defective work, if done, was carried out in such improper manner by order or with the permission of the contractors, and no evidence whatever to show that any officer of the department was cognisant of it; but that, on the other hand, there is proof to the contrary. Your Commissioner does not consider that it is a fair presumption, because on some occasions workmen, when not under the eye of an inspector, do bad work, that therefore such work is done according to instructions received from their employers; even though the fact that the work is badly done, by expediting the contract, lessens the chance of future employment for the

the workmen, whose credit, however, for smartness it may promote: but a man who will scamp his work is quite capable of wasting enough time to compensate for the saving that might result from the improper way in which it is done. And with the better class of workmen, including managers, a mistaken zeal will cause them, in their employers' assumed interests, to do acts which they know the contractors would not sanction.

On the question of general deficiency of cement, the first thing to be considered is that of the bulking of concrete. This is a vague and difficult matter to determine, and one upon which opinions of experts differ considerably. The two principal kinds of concrete used in sewer construction are the ordinary bluestone and sandstone concretes. The proportions of the former are—in bulk before mixing:—stone (“blue-metal”) broken to a  $1\frac{1}{2}$ -inch gauge, four parts; sand, two parts; and cement, one part. The latter consists of stone (hard Sydney sandstone), broken to a 2-inch gauge, five parts; sand, two parts; and cement, one part. The mode of mixing is to measure, in a gauge-box made for the purpose, in the case of bluestone concrete, 16, and in the case of sandstone concrete, 20, cubic feet of broken stone; on that, when spread out and washed, to place, similarly gauging it, 8 cubic feet of sand; and on the top of that to spread the contents of a cask of cement; or, if the contractor chooses to gauge the cement also, to do so in a gauge-box containing 4 cubic feet. The Government specifications allow a cask, of a specified weight, at 4 cubic feet, when unmeasured; but a contractor may measure it if he chooses: as a cask usually contains, forced into it by hydraulic pressure, cement measuring, when gauged, about  $4\frac{1}{3}$ , sometimes  $4\frac{1}{2}$  cubic feet, there is an advantage gained by gauging, which, however, appears to be overbalanced by the extra trouble involved: although, in the cases of bluestone and sandstone concrete respectively, the addition to the standard 4 feet of one-third of a cubic foot of cement would justify the addition, in the gauging, of  $1\frac{1}{3}$  foot of bluestone,  $1\frac{2}{3}$  foot of sandstone, and two-thirds of a foot of sand, this is not legitimate according to the specification, if the contractor prefers to break the cask on the heap of sand; though it may well be that workmen see no harm, in this view of the matter, in throwing in a few extra shovelfuls of stone and sand after filling the gauge.

Smaller gauges are used for small mixings of concrete (sometimes only a bucket), the cement being shovelled out of the cask: in all these cases the true bulk of the contents of a cask is necessarily taken.

After gauging, the whole heap is turned over twice dry, and then wetted and turned over twice or oftener wet till it appears to be thoroughly mixed: it is then ready to use, and should be used as soon as possible, as cement “sets” quickly; the setting consisting of various chemical combinations, which should take place *in situ*, and not begin beforehand to any marked extent, combinations into which most of the water of mixing either enters, in new chemical forms, or becomes water of crystallization—at any rate, it disappears as water and is no longer subject to evaporation. After the first setting, further chemical changes gradually go on, which, if the cement is good, make the concrete harder. In the first few months a marked improvement takes place; but the bulk is apparently determined in the setting, in which a slight shrinkage seems generally to occur (though pure cement expands in setting). Changes of bulk that take place afterwards are temporary expansion and contraction due to variations of temperature.

At first sight it might be supposed that 16 feet of stone, 8 feet of sand, and 4 feet of cement, would make a mixture of 28 cubic feet; and 20, 8, and 4, feet would come to 32; but the fact is that both the stone and the sand are full of interstices. The grains of sand are very small compared with the pieces of stone, and the particles of cement are still smaller compared with the grains of sand. The consequence is, that, in mixing, the cement practically disappears into the sand, filling, or partly filling, the interstices; and the sand and cement find more or less room in the cavities between the stones; and so, in some cases, the bulk of the mixture is actually the same as that of the stone alone; in other cases it is somewhat larger. The final shrinkage in setting seems to be due to causes quite outside of this mechanical disappearance. But various circumstances modify the bulking of similarly proportioned makings of concrete. The difference in the nature of the sand may be neglected, as making a comparatively trifling difference in bulk; but the form of the stone is a very important element. The shapes into which it is broken make a distinction in the aggregate size of interstices. Different varieties of the

the same kind of rock have different fractures; but the most effective of all varying conditions in determining bulk is the relation between the sizes of the pieces of stone. If it happens that, from the largest to the smallest, they can so arrange themselves that all the interstices between the larger stones are roughly filled with smaller ones, then the largest weight of stone is found in a given bulk, and the vacant spaces ready to receive a filling of sand and cement are least. It is obvious that this is the condition of largest bulking, although the bulk would vary according as the mixing of stones of various sizes is more or less regular. And, inasmuch as it is a cause of weakness in concrete to be porous or spongy—a peculiarity to a certain extent of all cement mixtures—it follows that the better the stones fit into one another the denser will be the mass when the sand and cement are thoroughly incorporated by mixing through it. In the minds of some of the witnesses there appeared to be a mistaken belief that, the more evenly the stone is broken to the gauge, the better is the work. The specification for concrete is opposed to this idea, as it provides that the dry stone shall be screened through (or more properly on) a screen of  $\frac{1}{8}$ -inch mesh, the evident intention being to remove little more than sand and earth, and to leave in the stone pieces of all sizes from that of a very small pea upwards to that of the prescribed gauge, which, instead of being intended as an average of size, is meant to be a maximum limit. There is no doubt that the forking of metal, which of course would have the effect of separating out nearly all the smaller stones, is sometimes insisted on by inspectors; but, unless this is the result of a wrong view of the specification taken by a particular inspector, it is accounted for by the fact that, in the absence of a screen, or on account of the difficulty in using it under the circumstances, the fork is the only instrument that will separate from stone that has been knocked about and trodden over, the sand and rubbish that are then to be found in it. And if even good, sharp, sand is allowed to be mixed with the stone, then of course the concrete is reduced in strength; as, the prescribed bulk of sand being also added, the cement is unduly diluted with an excessive quantity of sand; and, within certain limits, the more cement there is to a given bulk of sand, the stronger is the mixture, which forms the binding matter of the concrete and so gives strength to it. The proportions, in size, of the pieces of stone also vary with the mode of breaking. In stone broken by a crusher there are a larger number of small pieces than in stone “knapped” or broken with a hammer.

Another important factor in determining the bulking of concrete is the ramming. Concrete, put into work in a body between boards—as in the pier of an arch—is rammed vertically under most favourable conditions for compression, and will be found much less spongy when set than concrete placed in a narrow and uneven space over the crown of a sewer, where it has to be, without violence, the brickwork being hardly set, rather pushed in than rammed, horizontally. The bulking of these two classes of work would probably be very different. The bulk is also said to vary with the quantity of water used.

It is clear that, with all these unsettled conditions, to predicate generally that a certain bulk of stone, with fixed proportions of sand and cement, will give a certain bulk of concrete, is impossible. In other words, a rule cannot be laid down stating how many casks of cement will be required to make a given quantity of concrete. Averages may be struck—that is the best approach to accuracy that can be attained.

On this question a great deal of evidence was called. It was that of experts, and varied, as usual. At first sight, the best testimony of all would seem to be that of Messrs. McCredie and Thompson, straightforward, intelligent, and accurate, witnesses. They made experiments, by mixing their materials in a box, ramming it moderately, waiting till it was set, and measuring the result. The second experiment—the first having been made under the mistaken impression that the stone should be forked—gave certain results with knapped stone, shovelled from a heap and placed on a  $\frac{1}{8}$ -inch screen; it was washed on the screen, and all that did not pass through was shovelled into the gauge-box. This plan differed slightly from the specification, which provides that the stone shall be screened first and washed afterwards. It is possible that by such treatment as the stone received, the smaller particles would be sifted out more effectually than by the ordinary shovelling over an inclined screen. However, there was said to have remained a large proportion of stone the size of a pea. The results were these:—Sandstone concrete showed no increase

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in bulk beyond that of the stone ; therefore every cubic yard of concrete would contain  $\frac{27}{20}$  or 1.35 of a cask of cement, if the cement were taken at 4 cubic feet to the cask, or 1.24 if the cask were considered to hold  $4\frac{1}{3}$  cubic feet. Bluestone concrete showed a slight increase in bulk, viz.,  $\frac{1}{24}$ , with the result that each cubic yard of concrete would contain 1.62 or 1.495 of a cask, according as a cask were taken to hold 4 or  $4\frac{1}{3}$  cubic feet. This test, in addition to the fact that the stone was knapped, and that the screening was probably very good, was made under the best conditions for ramming—conditions, therefore, unfavourable to making bulk, and tending to increase the proportion of cement in a given measurement of concrete.

The simplest way to compare the evidence of different witnesses is to take the number of cubic feet of concrete that they respectively say will contain a cask of cement. To begin with, therefore, the experiment of Messrs. M'Creddie and Thompson gives, as this number, 20 of sandstone concrete, and  $16\frac{2}{3}$  of bluestone. Mr. Gilliver, a contractor of great experience, puts the numbers at  $23\frac{1}{2}$  and  $19\frac{1}{2}$ . He said he had tested it (page 286, Questions 9853, 9887. Mr. Rhodes, also a contractor, gives 24 and 20. Mr. Butcher names about 24 and  $20\frac{1}{4}$ ; he speaks of knapped stone, forked according to a regulation of the Water and Sewerage Board, which differs in this respect from the Sewerage Construction Branch of the Public Works Department. If the mean of these several opinions be taken, the result is 22.9 cubic feet of sandstone concrete, and 19.1 of bluestone concrete, to a cask of cement; considered as equal to 4 cubic feet. If the cask be taken as containing  $4\frac{1}{3}$  cubic feet, then these numbers change to 24.8 and 20.7 respectively.

There were certain witnesses called on behalf of the department who gave evidence on this question. Mr. Griffiths, Assistant Engineer to the Water and Sewerage Board, put the quantities as 27 and 22. He says—page 526, Q. 16225—he has known sandstone concrete to go as high as 30 cubic feet to the cask of cement.

Mr. Spencer said his estimate was that a cask of cement would make a yard of sandstone concrete, 27 cubic feet, and a yard of bluestone concrete would take about  $1\frac{1}{2}$  cask; this would be equivalent to a cask to  $22\frac{1}{2}$  feet; 22 feet, however, is what he deposed to as the number accepted by the department as a basis of calculation for payment where it was impossible to measure the work, the number of casks of cement used being known. This evidence was very clear—page 623.

Mr. Greenwood, contractor, civil engineer by profession, gave, on page 624, valuable evidence in this connection. His opinion is that, in the case of stone broken by a machine, with all the "shivers" in it, a cask of cement should go to a cubic yard of sandstone, and 22 feet of bluestone, concrete.

Mr. Eaton, contractor, on page 625, gave very specific evidence that he had actually, on two contracts where the concrete was put in between boards, and where, therefore, the ramming was easy and the measurement accurate, calculated the averages from the known data of measurements and number of casks used, and had found the sandstone concrete to go 26, and sometimes a little over 26, feet to the cask, and the bluestone concrete 23.

Three of these witnesses, therefore, agree in the numbers 27 and 22; the fourth, on the best basis of experience, gives 26 and 23, speaking of conditions in which the bulking of the concrete, to a given quantity of cement, would be lower than might be expected in packing sewers; in other words, where, given the measurement of the concrete built in, the number of casks of cement used would be more than in the case of the latter kind of work. As to the bluestone concrete used in the building of the lower part of the sewer, it is probable that, in the large open storm-water sewers spoken of by Mr. Eaton, the ramming would be heavier, and therefore the compression greater, than in the confined space of a small-tunnel sewer; therefore, it might be expected that a less quantity of cement would, in the latter case, go to a given bulk of concrete in position than even the quantity founded on the basis of one cask to 23 feet.

The question is what, on this evidence, would be a fair standard to accept in determining an important problem, resting upon the assumption that a certain number of casks of cement ought to be used for the making of a certain number of cubic yards of concrete, placed in position under, to a very great extent, conditions adverse to solidity. Is it fair, when a charge of fraud is sought to be based on the conclusion that less cement has been used than would appear to agree with the accepted standard, to take for that standard the result of a single experiment such

as was made, or is it more proper to accept such a substantial practical test as that made by Mr. Eaton, corroborated by the strong evidence of the preceding witnesses? It would certainly seem more consistent both with probabilities and with the ordinary principles of justice to adopt the latter course, and to use such a reasonable basis of calculation as Mr. Davis has adopted on page 631—namely, one cask of cement to 27 feet of sandstone and 22 feet of bluestone concrete; in reference to which he says, on page 634, Question 19331, that he considers he has estimated the quantity (proportion of concrete to cement) very low. If this is a fair course to pursue, then the calculations made by Messrs. McCredie and Thompson, on page 308 of the evidence, must be treated, in so far as concrete is concerned, as showing an excessive number of casks of cement for the number that should have been used on the work in the making of concrete.

The next head of material for which cement is used is brickwork. As to this, it appears on examination that Mr. McCredie and Mr. Davis very nearly agree; but the former has worked out his figures on a wrong basis, and the latter on a correct one. Mr. McCredie made an experiment, and found out how much cement was used in building a cubic yard of brickwork in a tunnel arch. The result—half a cask of cement to a yard of brickwork—if a cask is taken to hold  $4\frac{1}{3}$  cubic feet—shows that, in such construction, the proportion of mortar to brickwork is about 16 per cent. The mortar consists of two of sand to one of cement; and both Mr. McCredie and Mr. Davis assume a total disappearance of the cement in the sand. Mr. Davis's estimate for double-ring brickwork is 15 per cent.; in approximate calculations, such as these must necessarily be, so near an approach may be treated as a practical agreement. Mr. McCredie has worked out the whole quantity of cement required for brickwork on the assumption that it was all double-ring work. Mr. Davis, on the other hand, has distinguished, by consulting the vouchers, between double and single-ring work; and, taking 15 per cent. for the former, he has adopted 10 per cent. for the latter. This ratio has not been shown to be incorrect; reflection would indicate that it is probably near the mark. In single-ring work the only mortar used is in the small  $\frac{1}{4}$ -inch joints, except in the cases—rare where blasting is the mode of excavation—in which the space between the brickwork and the rock is just large enough to take a joint of mortar, and is too small for a packing of concrete. In double-ring work there is an intermediate collar-joint, between the two rings of brickwork, half an inch thick, it is this which makes the difference in the proportion of cement supposed to have been used in brickwork between Mr. McCredie's and Mr. Davis's results. Mr. Davis's should certainly be preferred. In cement rendering the difference between Mr. McCredie's and Mr. Davis's estimates is small. It is apparently explained by assuming that Mr. Davis takes  $4\frac{1}{3}$  whereas Mr. McCredie assumed 4 cubic feet as the contents of a cask of cement. Mr. McCredie finally adds a substantial number of casks for grouting. This is supposed to conform to a clause of the specification which provides for laying concrete in layers and grouting between each two. Mr. Davis has explained that in sewer work this mode of building is not, in fact, and could not well be, adopted; the concrete forming the lower part being worked in behind and under the lagging boards till the top level is reached. The only grouting required would be that used on the stepped-back end of a length before another length is begun, as the work proceeds along the tunnel, and in a few other cases: but the whole quantity of cement used for this purpose would be too small to be worth notice. As to other questions, it was fairly contended that Mr. McCredie's quantities must be really within the mark for two reasons—first, that the "margin" allowance paid for on the vouchers in Contract 79 represented less concrete than was actually used; and, secondly, that nothing had been added for waste. To the former contention Mr. Davis, in putting forward his results as approximate, replied that the proportions of cement to concrete that he had taken were so large compared with the probable truth as to fairly allow for this difference. As to the argument founded on assumed waste, Mr. Davis explained that the waste is small. It would occur principally in the bricklaying and the rendering. Cement being valuable, contractors naturally do their best to prevent its being wasted, as the loss comes out of their own pockets. In bricklaying, the bricks in a tunnel being laid on the lagging boards of the centering, it is not easy to waste mortar at all, though it is found that some little has always to be cleaned out—perhaps dropped in pointing up the brickwork—before the rendering begins. In  
intending



rendering there can hardly be any waste. If the soffit is rendered—frequently it is not—then it is done first, the invert next, all in one job; and the whole has to be left clean and smooth, the plasterer working backwards: he cannot therefore leave any waste in front of him.

It may be that Mr. M'Creddie's estimates come nearer to the truth than Mr. Davis's; but it may be the reverse. So much uncertainty enters into all these calculations—the premises being to so great an extent mere assumption—that the fairest conclusion to come to is that, if the number of casks of cement proved to have been provided by the contractors nearly agrees with Mr. Davis's estimate of the number that ought to have been used, then there is no substantial ground for suspecting—much less for asserting—fraud in relation to the use of cement: if it be proved to fall short of this quantity by a considerable amount that then there is ground for suspicion.

Mr. Davis's calculations are to be found on page 631 of the evidence. Taking the three contracts to which particular attention has been drawn in relation to shortage of cement, he works out, as the total number of casks that ought to have been used on these contracts—69, 79, and 79A—15,606. As some evidence to show that that number of casks at least was actually used, he then gives the number that, according to the inspectors' returns, appear to have been used. This number is 15,512, practically—in so large a number—the same. These returns it was the duty of the inspectors in charge on the different contracts to keep and hand in to the Resident Engineer. As Mr. Davis explains, the principal inspector has to take some of them second-hand from other inspectors in actual charge of other sections of the works. A part of a cask may be used in one place and a part in another; and so mistakes will creep in, to the extent perhaps of 5 per cent. (probably by way of omission), but every inspector in charge of cement work has to keep a record of every cask or part of a cask used; and, therefore, the return is at any rate supposed to be correct. The full returns will be found on pages 89 to 94 of the Appendix. If the inspectors did their duty, these returns must show the number of casks actually used with a fair approach to accuracy, if they do not so show the number, then the cause must be either collusion between the inspectors and the contractors or their men, or carelessness in making entries, or in allowing themselves to be deceived by accepting from the workmen lying accounts of the number of casks used. This was suggested by Dawson (page 17, question 590). A comparison between Mr. Davis' estimated numbers and the inspectors returns appears thus:—

|  | Contract 69. | Contract 79. | Contract 79A. |
|--|--------------|--------------|---------------|
| Mr. Davis's estimate ... ..  | 8,387        | 4,642        | 2,577         |
| Inspectors' returns (taken from the Appendix—<br>Mr. Davis's figures were imperfect as<br>they appear on page 631 of the evidence) | 7,963        | 5,148½       | 2,400½        |
| Deficiency in returns compared with<br>estimate ... ..   | 424          | .....        | 176½          |
| Deficiency in estimate compared with<br>returns ... ..   | .....        | 506½         | .....         |

The differences being respectively 5 per cent., nearly 10 per cent., and nearly 7 per cent. These discrepancies appear remarkable; but the explanation that suggests itself is, in the first and the third cases, that the deficiency in returns compared with the estimate may be caused, partly by over-estimate and partly by omissions in the returns, or wholly by the latter; in the second, that the excess of returns over estimate represents—with something added for omissions—the large difference due to the non-allowance of as full a "margin" as fairly approached to the packing actually used. If Mr. Davis has not over-estimated the number, as far as proportion of cement to concrete is concerned, then the returns would indicate that some addition should be made to his total, to the extent of perhaps 750 casks, to represent the unpaid for packing in Contract 79—5 per cent. being added, for omissions, to the inspectors' return of 5,148. If he has made such an over-estimate, then it may still be that his aggregate is nearly correct. The great discrepancy that may be noticed between Mr. Davis's estimate and the returns (in the *Appendix*) in the relative quantities for concrete and brickwork, is explained by him on the ground that, as concrete packing is going on at the same time as the making of mortar for the sewer  
brick

brick lining, it is impossible to keep the quantities of cement used for each purpose distinct; and so a number of casks really used for concrete appear under the head of brickwork.

But Mr. Christie has gone into a very careful and exhaustive inquiry, directed to the discovery of the number of casks of cement actually purchased by Carter & Co., and Carter, Gummow, & Co., for, and brought on to the site of, these three contracts, extending his examination also beyond the scope of these contracts to other concurrent works carried on by the same firms. Whilst Mr. Davis's calculations lead him to the conclusion that about 15,606 casks should have been used, and the Inspector's returns show 15,512 as having been used, and whilst, with the addition deduced from a comparison, the former number may fairly be increased to about 16,350 (by adding the 750), and the latter may be assumed to represent about 16,300 (when the 5 per cent. is added for omissions), Mr. Christie can only discover that an aggregate of 13,431 casks was actually supplied to these three contracts, leaving a deficiency of about 2,900 casks. Mr. Carter having sworn that all purchases of cement were paid for by cheques, which would appear in the Bank pass-books supplied to the Commissioners by the firm, Mr. Christie was enabled to trace all these transactions; and, by examining also the books of the firms from whom the cement was bought, to discover the destinations of the several lots. As far as the deliveries to the contracts themselves go, there seems no reason to doubt the substantial accuracy of the conclusions arrived at by Mr. Christie. Assuming the deliveries proved to particular localities to indicate the quantities used on the contracts there situate, and taking the numbers based upon Mr. Davis's estimate, with the addition applicable to Contract 79, the comparison stands thus:—

|                        | No. of casks proper to be<br>used on Contract. | No. brought into<br>Contract. | Deficiency. |
|------------------------|--|-------------------------------|-------------|
| Contract 79 and 79A... | 7,969  | 6,702                         | 1,267       |
| Contract 69 ... ..     | 8,387  | 6,729                         | 1,658       |
|                        | 16,356   | 13,431                        | 2,925       |

But, in reply to this *prima facie* of shortage, there was produced abundant evidence of the fact that it has been a constant practice to cart cement from one contract to another, so as to cause great difficulty in tracing the final destination of any particular parcel. The practice is for contractors to have sheds on the work, as well as sheds off it and near to it. It is a rule, perhaps not always enforced, that cement which has failed to pass the test shall be removed off the site of the works; it may then be stored in one of the contractors' sheds not situate on the ground, but close by. Cement is bought subject to Government test, and is returned, the merchant paying cartage both ways, if it fails to pass. But it does not follow that because it has failed once it may not pass later. If it is, as it may be, the presence of an excess of unslaked lime in the cement that has disqualified it, then the lapse of a few months may cure that defect, and a second trial may be successful. Cement may therefore have been held by a contractor in his shed off the works pending a further test, while he is using another parcel that has passed; if the former lot finally passes it may have to be transferred to another contract. Carter & Co. and Carter, Gummow, & Co., it was sworn by several members of the firm, were in the habit of buying extensive stocks of cement to arrive, and, for the convenience of the merchants, storing, in sheds in which there happened to be room, large lots for which the contractors had no immediate use. Mr. Carter's evidence on page 235 touches on this subject. In October, 1891, when Contract 72 was stopped, it was sworn by Mr. Carter—page 243—that he had a large quantity of cement in stock, stored upon or near the site of that contract. In the claim made for compensation for stoppage of the works there appear two items—1,300 and 2,000 casks of cement: the first item evidently refers to passed cement on the ground, the whole price of which is claimed (no doubt one of the items that Mr. Hickson, in his allusion to the claim in his minute of February 23, 1892, said could not, in such form, be entertained. Mr. Carter however, contended that, as the department had accepted it, and so it became the property of the Crown by the terms of the contract, the contractors had a right on the stoppage to ask the department to keep it and pay for it); and the second to untested cement in a shed or sheds off the site, the two together making up an amount estimated to be sufficient to complete the part of the work withdrawn: in fact, Messrs. McCredie and Thompson—

page 263—calculated the quantity of cement required for this construction at about 3,430 casks : for the reasons already gone into, their estimate may be taken as excessive: Mr. B. C. Simpson, in working out Carter & Co.'s claim, would not be inclined to under-estimate the quantity; therefore it may be taken that his claim for loss of use of 1,300—2,000 (3,300) casks must certainly be intended to represent—and, unless an attempt was being made to defraud the department, does fairly but fully represent—cement on the ground or in the neighbourhood ready for use on, and estimated to be sufficient for, the countermanded work, exclusive of what would be required for finishing the work in hand up to Mitchell Road, for which, of course, no claim would be made; and about the time the upper part of the contract was withdrawn an application was made on behalf of the contractors to have 2,000 casks of cement tested, but was refused by the department for fear the testing might in some way (as Mr. Carter contends) prejudice the rights of the Crown in relation to the withdrawal. This action of the contractors bears out the same view of the then existing state of affairs. As soon as the contractors were allowed to go on with the upper end of Contract 72 there would be no longer any objection to their having cement tested as for that contract, even in excess of its requirements. A comparison of cement tests and inspectors' returns for Contract 72, on pages 194 and 195 of the Appendix, shows that there was a final excess of cement tested over cement used on that work of 2,466 casks, of which 1,222 remained over after the first part of the work was completed. This is a remarkable corroboration of the facts relied upon by the contractors, in two directions. Mr. Carter's evidence on page 602 is very positive on the question of the final excess of cement on Contract 72, and as to the fact that large quantities were carted away to the North Shore. Mr. Snodgrass's evidence on pages 689 and 690 is to the same effect—that there was a very great excess of cement on Contract 72, and that a large number of casks were carted to North Shore, there being in hand not only the quantity required to complete the second part of the work, but a good deal more. The contractors had expected, as Mr. Carter said, that there would be a further branch, for which they hoped to tender successfully, of this Shea's Creek storm-water sewer, which, in fact, was not gone on with.

In the course of the inquiry a witness named Burcombe was called by Mr. Parkes—page 448. He gave evidence to the effect that he had carted cement from Shea's Creek to the North Shore. If his evidence is correct he must have carted some 1,200 to 1,300 casks; and he deposed that Booth and Molloy carted some in addition to this. When he said his teams drew three loads a day, it seemed, considering the distance—a good 6 miles—as if he must be mistaken: 36 miles a day, at  $3\frac{1}{2}$  miles an hour even, would take over ten hours on the road, exclusive of delays in feeding, loading, and crossing on the steam ferry; but Mr. Carter afterwards deposed to the extraordinarily long hours that these draymen and horses worked—page 684, Question 20654—suggesting, however, that it was more probable that the trips would average two and a half, as he explains on page 683, Question 20653. This would bring down the number of casks by one-sixth—say to about 1,100. However, Burcombe's recollection of details was so uncertain that his account can only be taken to mean this, that he carted a large number of casks—probably over 1,000; and that other carters were also doing the same; as to the exact time at which he did it, he cannot recollect. There does not appear to be any ground for disbelieving Burcombe: his statement was made in answer to a question put by Mr. Parkes nearly at the beginning of his examination: he was in no way led up to his answer. As work on Contract 79 could not have begun till it was fairly certain that Contract 72 would be gone on with—that the withdrawal would only amount to a suspension—the carting of cement from Shea's Creek to the North Shore would be the result, really, not of the fact that there was just about sufficient cement on 72 to finish the whole contract to Munni-street, but that there was also a considerable excess, that had been stored there before Carter & Co. were certain of getting Contract 79—that is, before the end of February, 1892. Cement that had been bought for future delivery would from that time, of course, be delivered at the North Shore, to save cost of unnecessary cartage, even if the contractors had large sheds ready near the Shea's Creek works. The evidence of Inspector Fowle—page 539—shows that no cementing work was done on Contract 79 before June, 1893. Cement, if carted from Shea's Creek, may have arrived on or near the site of Contract 79 at any time either before or after this date. If untested it would have to pass after being brought there,

there, before it could be used. Unless it had been already tested in bond—which was proved to be a common practice, the cement being thenceforth kept under the control of an officer of the department, and branded only when it went out of the store for delivery—cement delivered by the merchants would stand in exactly the same position as untested cement carted from Shea's Creek; it would have to be tested after arrival.

When Inspector Fowle came on to Contract 79, he found, as he has proved—page 540, Q. 16376—853 casks in a shed in Alfred-street. There are some fairly strong grounds for presuming that this cement did not come from Shea's Creek, that it was in fact some of the cement included in the sales which go to make up the number traced by Mr. Christie to Contract 79. It is not, however, clear that there was not at the same time cement in other sheds of the contractors at the North Shore which may have come from Shea's Creek. But, at whatever time cement arrived, it might be expected to appear in the Contract Journal: one is kept on every contract: and its omission would seem to be evidence of its non-existence. This would certainly be so if the journal could be taken as a full and exhaustive account of all the cement that arrived. But there is evidence in the journal itself that this is not so. One of the very earliest entries in the journal—that of May 15—in which any mention is made of cement, alludes to some cement that *had been* advanced on, and yet of which no former notice whatever appears. Going carefully through the journal, your Commissioner could not find in that record anything to show the receipt (after deducting some cement sent away) of more than 4,082 casks, with the addition of a vaguely-mentioned lot, of which the number was not given, said to have arrived from Contract 69, presumably a small number. This would show a deficiency, when compared with the inspectors' returns for Contract 79 (5,148½) of over 1,000 casks, leaving, if the calculation as to apparent shortage on the aggregate of the two contracts is correct, only about 250 as the apparent deficiency on 79A. This looks improbable, and an examination of the entries in the book also discloses this fact:—that, with the exception of some small lots received towards the close of the contract, when particular attention was called to the want of cement, the work being stopped in consequence, apparently as the result of a miscalculation of the amount necessary to finish it, all the entries deal with cement in special relation to testing. The natural conclusion to draw is that it is impossible to gather from the journal, that begins by omitting mention of the cement actually advanced on, the number of casks of tested cement that may have arrived on the ground from time to time, as to the passing of which there could never be any question, and when there was no suggestion of delay arising from the want of it, and that the mere non-mention of the arrival or whereabouts of a lot of tested cement is no disproof of its existence.

Apparently, Contract 79 would not require, to make up the difference between the amount of cement that ought to have been used and the amount traced to it by Mr. Christie, the whole of the excess on Contract 72, shown by comparing the returns, amounting to 2,466 casks (possibly to be reduced somewhat by omissions in inspectors' returns for Contract 72). These tests do not limit the number, of course, as cement tested in bond may also have come on to the work. In fact, Mr. Christie has proved that about 13,400 casks were supplied to the three Contracts 79, 79A, and 69; yet he can only find that 11,740 were submitted for testing for use on these contracts. Of the excess on 72 some—208 casks—went to Waverley. It was suggested that 600 were sold to Danahar, Taylor, and Burton; this Mr. Carter positively denied, asserting that they came from the Glebe contract—pages 682, 684–5. But 800 casks sold to Flood and Rutherford may have come from this stock—Mr. Christie's evidence, page 676; and 207 casks appear to have been transferred from Contract 72 to Iron Cove Creek and the Glebe, making a total deduction of 1,007: this would still leave an apparent excess on Contract 72 of 1,459 casks. Contract 79 was the work to which these would naturally pass; and, if they constituted the whole excess on Contract 72, then it is apparent that from that source there might be made up more than the apparent deficiency on Contracts 79 and 79A.

As to Contract 69, in this relation, the tender was accepted in December, 1893. This would be about fifteen months after the completion of Contract 72. It would hardly be likely that any further balance of cement from Contract 72 would then remain over for the use of Contract 69, though it is just possible: no evidence has been given to explain the apparent deficiency of 1,659 casks on this contract.

Bad

Bad gauging might account for it if this were indulged in; as very little, if any, concrete packing in sewers was used on this contract, that opportunity for scamping was hardly present: the improper filling of sumps, if it took place, would not account for much. Then there is the fact that the inspectors' returns are only five per cent. short of the proper number of casks calculated by Mr. Davis; and the witnesses who spoke to bad work on this contract all—or nearly all—spoke well of the inspectors, saying that whatever scamping took place was done behind their backs.

Taken all together, the evidence of sales and deliveries certainly tends to raise a suspicion that a substantial shortage of cement took place on this contract. At the same time, the whole proof rests so much upon hypotheses, and is so full of uncertainties, that it would be very dangerous to draw from it anything like a definite conclusion. If it were really proved that there was shortage of such a substantial amount of cement as would be represented by about one-fifth—as suggested by the evidence on Contract 69—there would then be a strong suspicion, amounting almost to certainty, that this took place with the knowledge of the management, though it would still be quite possible that the partners not immediately concerned in looking after the work itself were unaware of the course of fraud that was going on. But, in any view of this matter, there appears no ground for suspecting the officers—much less the heads—of the department of any guilty knowledge or connivance.

Your Commissioner, therefore, is of opinion—1st, that this charge is unproved; and 2nd, that the finding on charge 7, under the head of Contract 69, is not affected by the evidence that has been produced touching the general deficiency of cement.

#### CONTRACT 118 (JOHNSTONE'S BAY).

1. *With allowing defective materials to be used by the contractors, by which a loss is sustained by the Crown.*

I will now refer to Contract 118. That is the contract in reference to which I complain, that unemployed labour was taken to do the work which they had to do under their contract. O'Neill & Co. were carrying out Contract No. 83, and they informed me that the whole of the sandstone which they brought for this work was condemned. That stone was returned to Mr. Ryan's quarry at Pyrmont. Then Messrs. Carter and Gummow were allowed by the Engineer-in-Chief to use that condemned stone at half price on Contract No. 118. You cannot get away from this statement, because O'Neill saw Ryan, the contractor, and Ryan says emphatically that he sold to Carter and Gummow, with the approval of the Government officials, the whole of that stone, to an enormous extent, which was condemned in O'Neill's Contract, No. 83. O'Neill in all probability is not a man of great means. He is not perhaps so much in favour with the department as are Messrs. Carter and Gummow. It is a serious thing if stone which is defective on one job is permitted to be used on another job. It was taken over to Contract No. 118, crushed in Mr. John Young's mill, and put into the contract holus-bolus as it came out of the crusher.

Mr. ASHTON: Was it the same class of work?

Mr. PARKES: If anything it was a superior class of work.—*Hansard*, 12th May, 1896.

2. *With allowing the contractors to have the benefit of labour performed by the unemployed, paid by the Crown, to drain the works of the contractors, which drainage the contractors have to take the responsibility of under their agreement with the Crown.*

Now, let me take another instance. These gentlemen have a contract at Johnstone's Bay for what they call storm-water channeling. This stormwater channeling is taken through a lot of mud flats. For four or five weeks the Government employed about forty or fifty of the unemployed to drain the water off this land for the contractors. The Government actually employed the unemployed for this purpose. I can bring plenty of evidence on oath that forty or fifty men were employed for four or five weeks draining the water off the land where these gentlemen had to carry out their contract. The effect of that was to put £280 or £300 into the pockets of the contractors.—*Hansard*, 26th September, 1895.

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3. *With omitting the necessary papers ordered to be laid upon the Table of the House of Parliament, by which Honorable Members were unable to judge of the manner in which the contract was conducted.*

In connection with Contract 118, all the plans and sheets of tenders, and all correspondence have been omitted, and twenty pages of deceptive padding have been put in.—*Hansard*, 12th May, 1896.

Mr. Parkes, towards the close of the inquiry, assented to your Commissioner's suggestion that he should no longer press the charges made under the head of this contract. This action being consistent with the view taken by your Commissioner as that towards which all the evidence clearly tends, it appears to be sufficient here to point out that there was no evidence given worthy to be considered of the use of bad materials on this contract; but, on the other hand, the contrary was amply proved. There was, further, conclusive evidence, the correctness of which a view of the ground fully corroborates, that the action taken by Mr. Hickson in having the drain in question cut was not only justifiable in relation to the rights of the contractors, but was properly taken in the public interest, as well for the purpose of properly carrying on the reclamation works in Rozelle Bay as to avoid serious risk of an action against the Crown for damages, or a claim for an injunction, at the suit of the contractors.

CONTRACT

## CONTRACT 65 (GLEBE).

1. *With allowing defective work to be done, by which a large loss of money was sustained by the Crown, and with not making any effort to recover such loss from the contractors, Messrs. Carter, Gummow, & Co.*

The evidence in support of this charge has already been considered in dealing with the question of defective work in relation to cement: it is unsatisfactory as against the contractors, and futile as against the department.

## ALLEGED CONCESSIONS BY THE DEPARTMENT TO CARTER, GUMMOW, &amp; CO.

*That Robert R. P. Hickson, while an officer of the Crown, viz., Engineer-in-Chief for Public Works, did allow of undue concessions being granted to Messrs. Carter, Gummow, & Co., contractors for sewerage works in the Colony of New South Wales, his son, George Hickson, being an interested party in the firm of Messrs. Carter, Gummow, & Co.*

1. *By permitting Messrs. Carter, Gummow, & Co. to obtain the monopoly of the Monier system in Government works by inducing the Minister to enter into an agreement to adopt their patent in public works, and to pay 15 per cent. royalty for use of same by an improper minute, inaccurately stating the cost of a special test made in connection with the same.*
2. *By permitting Messrs. Carter, Gummow, & Co. to obtain Contract No. 79 in an improper manner to the advantage of the contractor, and to the detriment of the Crown.*
3. *By permitting Messrs. Carter, Gummow, & Co. to obtain Contract No. 77 in an improper manner to the advantage of the contractor, and to the disadvantage of the Crown.*
4. *With allowing faulty supervision of the contracts carried out by Messrs. Carter, Gummow, & Co., by which inferior concrete was supplied, making defective work, there not being the specified quantity of cement used—more particularly in Contracts 79, 79a, and 69.*

I asked the Secretary for Public Works last week what connection Mr. Hickson had with the firm and with this work. I was told that Mr. Hickson was the engineer to these contractors; but I am informed, upon the most reliable authority, that of a Mr. Maddison, the contractor, who has left this firm, that Mr. Hickson took the position as a partner in the firm, he being a son of the Engineer-in-Chief. Now, it is an unfortunate position that this firm should have been allowed contracts under such circumstances as these; their engineer having to communicate with his father, who is in a position in the Public Works Department in which he could grant all sorts of concessions. This firm are the only contractors who during the last twelve months have received these numerous concessions. I have it upon the authority of Mr. Maddison, who has undertaken to produce a copy of the telegram, that a wire was sent in March, 1894, by one of this firm of contractors, Mr. Carter, to another member of the firm, Mr. Gummow, who was then in South Australia, to this effect: "Mr. Hickson must be taken into the firm at any cost." It was about this time that Mr. Hickson left the department, as his father said, on the score of retrenchment, and took up his position as an alleged partner in this firm; or, as I have been informed by the Minister, their chief engineer.

Mr. GARRARD: Has the hon. gentleman the telegram?

Mr. V. PARKES: The retiring partner assures me that he will produce a copy of the telegram. If it is not forthcoming a copy can be obtained from the Telegraph Department. He is willing to make a statement on oath, however, that this thing occurred. Having established this connection between the Engineer-in-Chief's son and the firm, I intend presently to show what concessions were given to these contractors.—*Hansard*, 26th September, 1895.

The same firm within the last eighteen months received a contract for sewerage works at North Shore. They received their contract under a schedule tender, and their sureties as usual were those of their own firm. No query is made as to whether they are in a good financial state or as to whether they can provide good disinterested sureties.—*Hansard*, 26th September, 1895.

I could cite other concessions given to these gentlemen, information as to which has been given to me not by one contractor, but by twelve or fourteen. Innumerable concessions have been given to them, and it would only be wearying the House to particularise them.

Mr. YOUNG: Let us have them all while the hon. member is about it!

Mr. V. PARKES: If an inquiry is made the House will find that there has been an undue amount of favouritism towards not only these contractors but many others.—*Hansard*, 26th September, 1895.

To show the artifice with which questions are answered by the Engineer-in-Chief, on the 19th instant I asked these simple questions of the Minister:

"(7.) What connection has a Mr. Hickson with this firm or with the works? (8.) Is this Mr. Hickson a son of the present Engineer-in-Chief?"

This was the reply:

"(7.) He is engineer to the contractors. (8.) He is the son of the Engineer-in-Chief for Public Works; but the Balmain contract referred to is being carried out under the supervision of the President of the Water and Sewerage Board and Engineer-in-Chief for Sewerage Construction, Mr. Darley."

Now, Mr. Darley has only been appointed to his present position about two months, and during all the time that this contract was being carried out it was under the Engineer-in-Chief.

Mr. YOUNG: No!

Mr. V. PARKES: The Engineer-in-Chief was the chief designer of it, and the contract was not carried out under Mr. Darley. I made sure of that fact. The answer I have quoted is a subterfuge. The question ought to have been answered by a simple "yes" or "no." The answer contains a misleading statement. The blame of employing these gentlemen has been put upon Mr. Darley. The Minister, in his reply, went on to say:

"In the case of the other contract referred to, namely, the sewerage works at North Sydney, which was carried out under the supervision of the Engineer-in-Chief for Public Works, I am informed that Mr. Hickson, junior, had no connection with that work, being at that time in South Australia."

But Mr. Hickson has been going backwards and forwards between here and South Australia. That makes no difference as to his connection with the firm. He is looking after their work in South Australia, and looking after their work here; and such an answer as that is, on the face of it, simply a blind, and it shows that there is some reason why there should be a full inquiry into the circumstances attending this contract.—*Hansard*, 26th September, 1895.

As far as I am informed there was a contract of £13,000, another of £10,800, and another of £11,000, all let without tender. My information has come from persons behind the contractors whose names I can give, and who will go before any committee and give evidence, and show that there is no equity in the dealings between contractors and Public Works officers.—*Hansard*, 26th September, 1895.

Some six months ago I moved for a committee, and made a statement to this House from hearsay, not from proof, and I took care to explain that to the House. That statement was given to me by ten or twelve contractors, who waited upon me and told me that it was useless for them to send in tenders to the Public Works Department on account of the favouritism shown to a particular firm.—*Hansard*, 12th May, 1896.

It will be recollected that in my speech six months ago I pointed out that this firm had received three contracts without tender. The only mistake I made was that I stated the sums wrongly and too largely. The Engineer-in-Chief says:

“The firm has received one contract only without public tender.”

The very documents in his own handwriting show that they received three contracts, one for £1,200, another for £2,000, and another for £12,000, without tender.—*Hansard*, 12th May, 1896.

The Engineer-in-Chief admits that his son is and has been the engineer of this firm since 1893. I want hon. members to bear that in mind. I am told by a man connected with these contracts, who has worked upon them, that the duties of Mr. Hickson, junior, are simply those of a sinecure. He has nothing to do but to walk about and take photographs. Now and again he uses a theodolite on the works to no purpose, and the inference from the Engineer-in-Chief's own statement is that his son is not in Sydney at all, that as a matter of fact, when he wrote this minute, he was not in Sydney, but in Adelaide. However, he was actually in this country, and I can prove by statutory declaration that he came over twelve months before with Mr. Gillan, one of the contractors.—*Hansard*, 12th May, 1896.

This charge, if it is to be read as having any tangible meaning, must be taken as an assertion, first, that George Hickson was at some time an interested party in the firm of Carter, Gummow, & Co.; and, second, that while he was in such a position the acts alleged to have been done by Robert R. P. Hickson took place, the motive, or at least a motive, for the doing of such acts being George Hickson's connection with the firm.

Each of the modes in which the alleged undue concessions are said to have been allowed to be granted has been, in substance, dealt with under the head of the contract to which it refers. As to the second—that which alludes to Contract 79—it also stands negatived by the fact that Mr. George Hickson did not leave the Government Service till May, 1893; while Carter & Co. obtained Contract 79 in February, 1892.

Mr. George Hickson's evidence, on page 98, and Mr. R. R. P. Hickson's, on page 562, Q. 17064, fully explain the circumstances under which the former left the department, and was taken into, and finally discharged from, the employment of Carter, Gummow, & Co. Mr. Carter's evidence, on page 104, Q. 3877, and Mr. Gummow's, on page 112, are directed to the same matter. It would be waste of time to go into a critical examination of the bearing upon this question of that most unsatisfactory of all kinds of evidence—a narration of conversations that took place years ago, in which some mention is said to have been made of a telegram, the very existence of which is more than doubtful. If it ever was sent, it cannot now be traced, as the original would have been burnt. It is quite possible that a real telegram, sent to Mr. Gummow to inform him of Mr. George Hickson's expected arrival, may have been the foundation upon which mistaken recollection, and imagination fostered by jealousy, built up the story that was carried to the ears of Mr. Parkes. The evidence proves that Mr. George Hickson did go into the service of the firm, and that the contractors had at the time work for him to do. It is quite possible that Mr. Carter's good nature may have led him to stretch a point in favour of a young man whom he would naturally regard as having been harshly treated. Carter, Gummow, & Co. being one of the few successful contracting firms, carried on by men whose education, training, and experience, explained their success, and were a guarantee of their stability, it was natural that Mr. George Hickson should try to get into their service: as long as they could do so, they employed him in another colony: the mere fact of his employment by a firm of contractors over some of whose works Mr. R. R. P. Hickson would have to exercise control, should not be charged against either father or son as an improper act, or as raising a presumption of unfair dealing, especially in view of the difficulty Mr. George Hickson would expect to find in procuring immediate employment anywhere, and the known fact that any large contractors in one colony may be said to be contractors in Australasia. It is clear also that Mr. George Hickson did throw out hints that he would like to become a member of the firm, which hints were discountenanced: probably he thought that, if the business could be worked with seven partners, it would get on equally well with eight; and he might, in a more modest way, be allowed to follow Mr. Gummow's example—supplying brains in lieu of capital: Mr. Gummow considered that seven partners



partners were too many already, and quietly "sat upon" Mr. George Hickson's overtures. He was not admitted: on the contrary, when the firm found they had no longer any need of him, he was discharged; he was certainly generously treated in his dismissal, but this generosity to employees appears to run through all the dealings of the firm.

The stories about his being a useless young man, kept by the firm in their employment for ornament or to please his father, amusing himself by wandering about taking photographs, appear to be groundless, except for the substratum of truth that he did use a camera on the works at Annandale when not actually working, instead of wasting his time.

Your Commissioner can see no evidence that Mr. Hickson allowed his mind to be influenced in favour of the firm of Carter, Gummow, & Co., by the fact of his son's connection with that firm. It is important to observe the sequence of events and their dates when dealing with this aspect of the question. First there were the two variable partnerships, Carter & Co. and Gummow & Gillan, competing with one another in obtaining contracts for sewer construction. In June, 1891, they were so far in unison as to join in the letter of protest against Bond and Hudson's being permitted to tender successfully for Contract 79. But it was not till August, 1892, that the firms coalesced, for the purpose of carrying on the South Australian contract. This was a heavy work, and no doubt their experience of each other gave them mutual confidence and suggested the expediency of joining their forces. There is no reason to suppose that they were in fact united in business before this: with all their trust in one another it could hardly be imagined possible that two such large firms would be in fact amalgamated before the date of their deed of partnership. Carter & Co. carried on Contracts 79-79A in their own name; but from the date of the amalgamation the new firm practically took up these works. After August, 1892, all contracts accepted in the names of any members of the partnership were shared in by all the continuing partners; these contracts were—69, date of signing, January 22, 1894; 79, June 20, 1894; 77, May 16, 1895; 118, June 15, 1895; 108 (North Shore Outfall Works), May 19, 1896. Mr. George Hickson entered the service of Carter, Gummow, & Co. in May, 1893, and left it at the end of April, 1896. Therefore the fact of his connection with the firm cannot have operated on Mr. Hickson's mind before May, 1893. Yet a number of the circumstances that have been relied upon as evidence of favouritism took place before this date. These comprise the whole history of Contract 72, and the letting of Contract 79, followed by the most important part of the history of that contract, including what is called in charge 2, under the head of that contract, manipulation of items, and the beginning of the return of retention money. On the other hand, there followed the employment by the firm of Mr. George Hickson the discharge of Inspector Reid, the letting without tender of Contract 79A—conclusively proved to have been the act of the Minister, contrary to Mr. Hickson's advice—the history of Contract 69, in which the only evidence of a concession worth notice is that concerning the blue-stone pitchers; the history of Contract 77 (the Monier question); and the account of Contract 118, admitted to disclose nothing like improper conduct. Against the history of Contract 69 is to be set off Mr. Hickson's act of establishing, before he can have anticipated his son's discharge from the service of the firm, the new system of tendering, which appeared to be intended as, and certainly was, an especially severe blow directed at the firm of Carter, Gummow, & Co.

If an examination of a series of events discloses an apparent continuing inclination in the mind of a man, and if a motive for that tendency is suggested, then it is important to discover when the motive began to operate: if the inclination appeared before the happening of the event that accounts for the motive, the fair conclusion is that the suggestion is unfounded. And if no motive at all can be discovered, then it is equally fair to infer from its non-existence that the inclination is only apparent, not real. Another very important consideration is this—if, on the basis of a foregone conclusion, or at least a strong suspicion, search is made through a history extending over several years for evidence to confirm the idea, and every fact is selected which may bear it out, those which tend to its disproof being passed by, it will, though utterly unfounded in reality, appear to have strong evidence to support it. This is how, as your Commissioner gathers from the history which led up to this inquiry, the contractors whose action brought it about came to hold the views which urged them on and justified them in their own opinion;

opinion; and it is upon this principle that the evidence in support of the charges made has been collated. Upon other matters lying still further back it is unnecessary to touch. Finally, in your Commissioner's opinion, none of the charges brought against Mr. Hickson have been proved by the evidence that has been produced. Your Commissioner has failed to discover in that evidence any grounds for further inquiry; and, in your Commissioner's opinion, Mr. Hickson and the other responsible officers of the Works Department stand exonerated from all suspicion of improper conduct in relation to the matter into which your Commissioner has been instructed to inquire.

In coming to this conclusion your Commissioner has not forgotten to give due weight to the consideration that, though several distinct pieces of evidence may, each by itself, be insufficient to prove the truth of a certain contention, still the whole of them taken together may satisfactorily bear it out.

Throughout this Report, as through the whole course of the inquiry, the question whether any one of the gentlemen who, during the time covered by the evidence, have held the office of Minister for Works has been implicated in any improper conduct in connection with the contracts of the firms or persons named in the Commission, has been ignored, for the reason that neither did Mr. Parkes at any time in the course of the inquiry raise such a contention, nor was any evidence whatever given by any witness that would suggest it. As disclosed by the testimony produced, the actions of each of the several Secretaries for Works who have from time to time presided over the department have shown a careful and conscientious regard for the public interest, unaffected by favour for any firm or person.

Before closing this Report your Commissioner wishes to bear testimony to the energetic, conscientious, and thorough manner in which Mr. Friend, Secretary and Shorthand-writer to the Commission, has carried out his manifold duties, giving most valuable assistance in the performance of the very laborious and difficult work imposed upon your Commissioner, who feels that it is impossible, in the time at his disposal, to embody in this Report anything approaching to such a complete analysis of the enormous mass of evidence taken as would fully do justice to the subject or would be adequate to the honor conferred upon your Commissioner by the entrusting to him of so responsible a duty.

I have the honour to be,

Your Excellency's obedient Servant,

(Signed) C. E. R. MURRAY.

B. HARRY FRIEND,  
Secretary,

Saturday, 21st November, 1896.

**PUBLIC WORKS INQUIRY COMMISSION.**

**MINUTES OF PROCEEDINGS.**

*FRIDAY, 22 MAY, 1896.*

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 2 p.m.

Mr. Varney Parkes, M.P., Mr. R. R. P. Hickson, Under Secretary for Public Works, and Mr. Carter, of the firm of Carter, Gummow, and Co., attended.

His Honor inquired whether any of the persons affected by the inquiry wished to be represented by counsel or solicitor.

Mr. Parkes said that he intended to conduct his case personally.

Mr. Hickson said that Mr. Ernest Smith, solicitor, would be present during the inquiry solely for the purpose of tendering him advice.

Mr. Carter intimated that Mr. W. Andrews, solicitor, would be present during the inquiry in a similar capacity in regard to the firm of Messrs. Carter, Gummow, & Co.

His Honor asked Mr. Parkes whether he was in a position to furnish a written statement of the charges he preferred, tabulated under the headings of the various contracts which formed the subject of inquiry.

Mr. Parkes undertook to furnish to His Honor and to Mr. Hickson on the following day a statement in accordance with His Honor's suggestion.

His Honor announced that he intended, for the time being, to sit on Mondays, Wednesdays, and Fridays, from 10 a.m. to 1 p.m.

Mr. Hickson said that the whole of the plans and papers respecting the contracts of Messrs. Carter, Gummow, & Co. with the Department of Public Works in the possession of the department would be handed over to His Honor on the following morning, and that the papers included in the return ordered to be printed by the Legislative Assembly on the 22nd October, 1895, were still in the custody of the Chief Clerk of the Assembly.

His Honor said the Clerk of the Legislative Assembly would be requested to obtain Mr. Speaker's authority to hand over the papers for use during the inquiry.

Mr. Parkes applied that he might have access to the plans and papers between the hours of 10 a.m. and 5 p.m. on the 23rd, 24th, and 25th instant.

Mr. Hickson also applied for permission to inspect the plans and papers on the 26th instant.

His Honor said the plans and papers would be available for inspection at any time during the inquiry.

His Honor at 3 p.m. adjourned the inquiry until 10 a.m. on Wednesday, 27th May.

C. E. R. MURRAY,  
Commissioner.

*WEDNESDAY, 27 MAY, 1896.*

His Honor, the Commissioner, sat at the Board Room, Chief Secretary's Office, at 10:30 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

The Secretary read His Honor's Commission.

Mr. Parkes handed in a list of charges, in compliance with the suggestion preferred by His Honor the Commissioner at the preceding sitting of the Commission as follows:—

CHARGES made in the Legislative Assembly of New South Wales as to improper conduct in connection with contracts of Carter, Gummow, & Co., and referred by the said Legislative Assembly to a Royal Commission for Inquiry and Report.

*Contract 69.*

1. With manipulating the schedule of Messrs. Carter, Gummow, & Co., the contractors for Sewerage Contract 69, so as to give the contractors an advantage over the Crown in their contract undertaking to build a sewer in Marrickville by paying them on the extravagant items of charge, and conceding those items upon which they had a losing price, and in defiance of the terms of Messrs. Carter, Gummow, & Co.'s contract with the Crown.
2. With allowing the contract to be taken up by Carter, Gummow, & Co., with an insufficient bond, and with ultimately breaking that bond by remitting the retention money and writing a minute by which the Minister was deceived and induced to consent.
3. With paying to the contractors large sums of money which they (the departmental officers) were not compelled to pay under Carter, Gummow, & Co.'s contract with the Crown.
4. With lending to the contractors £1,000 of State moneys improperly, and in violation of the terms of the contract, and without security.
5. With incompetency in administering the contract and carrying out the works generally.
6. With failing to comply with the orders of Parliament and placing documents upon the Table of the House in a manner calculated to deceive Honorable Members of the Assembly.
7. With allowing defective work to be put in the works, by which a loss is sustained by the Crown.

*Contract 72.*

1. With paying away large sums of money to the contractors, Carter, Gummow, & Co., which they (the departmental officers) were not obliged to do under the contract conditions; and with settling a claim, without a proper test as to the liability of the Crown, for a sum of £4,050 9s. 6d., by granting the contractors a preference over other contractors, and by not re-tendering for the contract, when in the interest of the Crown it was the clear duty of the departmental officers to do so.
2. With granting the contractors concessions in payments upon the contract, by which the Crown was a loser.
3. With withholding from the papers laid upon the Table of the House such documents as would allow Honorable Members of Parliament to understand the nature of the contract and the manner in which it was carried out.

*Contract 77.*

1. With allowing the contractors, after tenders had been received, to substitute for the Government plans and specifications a cheap patent aqueduct, styled the Monier system, of inferior material, without competition of any sort, by which a loss was sustained by the Crown.
2. With deliberately deceiving the Minister as to the true cost of the Monier patent, by minutes written by Robert Hickson, the then Engineer-in-Chief of the Department.
3. With deliberately deceiving the Minister, by which he (the Minister) accepted of certain security, which was of an improper and useless nature, for the stability of the patent for a term of three years, the deception being contained in minutes written knowingly by Robert Hickson, the then Engineer-in-Chief for Public Works.
4. With withholding the proper information concerning the above transaction from Parliament by not laying plans and other papers upon the Table of the House when ordered so to do by Parliament.

*Contract 79.*

1. With improperly granting to Messrs. Carter, Gummow, & Co., without re-tendering, Contract 79, by which a loss was sustained by the Crown.
2. With illegally returning the cash deposit lodged by Bond and Hudson for the good faith of their (Messrs. Bond and Hudson) acceptance of their tender.
3. With manipulating the items in the schedule of Messrs. Carter, Gummow, & Co., so as to increase the profits of the contractors to the loss of the Crown.
4. With allowing defective work to be done, by which a loss is sustained by the Crown.
5. With returning the cash security and the retention fund to the contractors, in violation of the contract agreement, to the advantage of the contractors, and hazarding the interests of the Crown.
6. With the discharging of Inspector Reid from the above contract for simply doing his duty in the interests of the Crown in insisting upon good material.
7. With improperly paying an amount of £350 6s. 8d. to the contractors for removing material, which work they never performed.
8. With allowing the contractors illegally to dispose, in anticipation of payment of £9,000 of funded stock.
9. With placing improperly to the account for payments on Contract 79 various items of payments for work done at Bondi.
10. With lending illegally, and upon no security, the sum of £1,360, upon materials not in the possession of the Crown.

*Contract 79a.*

1. With inducing the Minister, on the plea of urgency, to let the above Contract 79A to Carter, Gummow, & Co. without tender, by which a loss was sustained by the Crown.
2. With lending the sum of £485 of the moneys of the Crown to the contractors, illegally and upon insufficient movable security, and in violation of the Contract between the contractor and the Crown.
3. With failing to place upon the Table of the House the papers ordered by Parliament, by which Honorable Members might be deceived as to the nature of the transactions.
4. With permitting defective work to be executed by the contractors, by which a loss is sustained by the Crown.

*Contract 118.*

1. With allowing defective materials to be used by the contractors, by which a loss is sustained by the Crown.
2. With allowing the contractors to have the benefit of labour performed by the unemployed paid by the Crown to drain the works of the contractors, which drainage the contractors have to take the responsibility of under their agreement with the Crown.
3. With omitting the necessary papers ordered to be laid upon the Table of the House by Parliament, by which Honorable Members were unable to judge of the manner in which the Contract was conducted.

*Potts Hill Reservoir Contract.*

With allowing defective work to be done by Messrs. Carter, Gummow, & Co., by which a large sum of money was lost by the Crown, no effort at all being made to recover the same from the contractors.

*Alexandria Sewer Contract.*

With allowing defective work to be done by which a large loss of money was sustained by the Crown, and with not making any effort to recover such loss from the contractors, Messrs. Carter, Gummow, & Co.

*Glebe Contract.*

With allowing defective work to be done by which a large loss of money was sustained by the Crown, and with not making any effort to recover such loss from the contractors, Messrs. Carter, Gummow, & Co.

*Engineer-in-Chief for Public Works : Carter, Gummow, & Co.*

That Robert Hickson, while being an officer of the Crown, viz., Engineer-in-Chief for Public Works, did act collusively with his son, George Hickson, a partner of the firm of Messrs. Carter, Gummow, & Co., by which the said George Hickson obtained wrongfully money belonging to the Crown.

His Honor intimated that he had determined to exclude the representatives of the Press during the progress of the inquiry, and requested those present to consider the proceedings of a confidential nature.

His Honor inquired whether either of the parties desired, in connection with any inspection of works which might be considered desirable, to be accompanied by an independent expert with a view to the giving subsequently of expert evidence.

Mr. Hickson thereupon nominated Professor Warren.

Mr. Parkes nominated Mr. George McCredie.

Mr. Parkes said that he intended to call witnesses to prove that very defective work had been done in connection with Contracts 79, 79A, and 69, and that obstacles were thrown in the way of the discharge of the duties of the inspectors employed by the Department. He would also endeavour to prove that the inspectors had not received that fair consideration at the hands of their superior officers to which they were entitled in the public interest.

George Dawson, George Benson, and Robert George Reid were sworn and examined.

His Honor at 3:30 p.m. adjourned the inquiry until 10 a.m. on Friday, 29th May.

C. E. R. MURRAY,  
Commissioner.

*THURSDAY, 28 MAY, 1896.*

His Honor proceeded to the situation of alleged defective work upon Contract 79A, where an inspection was made by Professor Warren and Mr. George M'Credie.

C. E. R. MURRAY,  
Commissioner.

*FRIDAY, 29 MAY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Robert Rowan Purdon Hickson, John Henry Harris, George Wagg, and William Henry were sworn and examined.

George Dawson was recalled and further examined.

Mr. Parkes handed in the following charge:—

*Contract No. 77.*

With allowing defective work to be done on Contract No. 77, by which money was lost to the Crown; and further, that no effort was made to recover the money, so lost, from the contractors, Messrs. Carter, Gummow, & Co.

His Honor, at 2:35 p.m., adjourned the inquiry until 10 a.m. on Monday, 1st June.

C. E. R. MURRAY,  
Commissioner.

*MONDAY, 1 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Cecil West Darley, George M'Credie, Ernest Augustus Smith, Joseph Davis, and Christian Hansen were sworn and examined.

His Honor, at 12:30 p.m., adjourned the inquiry until 10 a.m. on Wednesday, 3rd June.

C. E. R. MURRAY,  
Commissioner.

*WEDNESDAY, 3 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

The Secretary read a letter from Mr. A. C. Budge, Clerk of the Executive Council, informing His Honor that His Excellency the Governor, with the advice of the Executive Council, had approved of the inquiry being open to the press and the public, and requesting that His Honor would give the necessary instructions to that effect.

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His Honor said he had regarded his Commission as in the nature of a confidential communication. He had not considered that he had any right to make public the evidence taken in the course of his inquiry. He had acted upon that principle on the previous occasion—the Fehon inquiry—on which he had held His Excellency's Commission, and no exception had been taken to its application. His Excellency having now requested him to admit the press and the public to the inquiry, he took that request to be practically part of his Commission. It at once removed all presumption of privilege and did away with the possibility of the question being raised that he was doing wrong in not treating his inquiry as of a confidential nature. Upon the mere ground of expediency, he had had some doubt as to whether it would be better to admit or exclude the press; but on the whole he concluded that it was better that the press should be excluded, and for that reason he had not asked for permission to allow the inquiry to be made public, which course he would have taken had he thought it desirable. Of course, he had known that the result of the inquiry, together with the evidence, would probably be made public in the end; but while the inquiry was proceeding he thought it was on the whole better that the evidence should not be made public. In the face of the fact, however, that a strong opinion the other way was held by persons quite as competent to form an opinion as he was; taking also into consideration one reason, which did not strike him at first, he would not now, of course, attempt to suggest that this direction from His Excellency was one which was not well founded upon expediency and public policy. He considered that it was no reflection upon his action that he was now directed to act in a way different from that in which he had hitherto acted; and he was only too glad to comply with the request, which he took to be practically a command from His Excellency. Therefore, the press had the right to be present. The public in theory had also the right to be present. As far as the public were concerned, the room was not sufficiently large to permit of their being present in great numbers, and he would request them not to come in such a way as to hamper the business incidental to the inquiry. The press were welcome to report the whole of the proceedings.

George Dawson, Robert George Reid, Christian Hansen, and Robert Rowan Purdon Hickson were recalled and further examined.

George Andrew was sworn and examined.

Mr. Parkes requested that His Honor would cause a communication to be addressed to Mr. George Hickson, son of Mr. R. R. P. Hickson, Under Secretary for Public Works, who was at present, he understood, in Perth, in the service of the Government of West Australia, intimating that his attendance was necessary.

His Honor said that all he could do in the matter would be to communicate with the Premier of West Australia, requesting that Mr. Hickson might be granted leave of absence, without prejudice to his official position, to admit of his attendance. That would be done at a later hour of the day.

His Honor, at 2:35 p.m., adjourned the inquiry until 10 a.m., on Friday, 5th June.

C. E. R. MURRAY,  
Commissioner.

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*FRIDAY, 5 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Robert Rowan Purdon Hickson was recalled and further examined.

Christian Herman Ohlfesen-Bagge was sworn and examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m., on Monday, 8th June.

C. E. R. MURRAY,  
Commissioner.

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*MONDAY, 8 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Robert Rowan Purdon Hickson and Cecil West Darley were recalled and further examined.

Justin M'Sweeney and Henry Deane were sworn and examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m., on Wednesday, 10th June.

C. E. R. MURRAY,  
Commissioner.

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*WEDNESDAY, 10 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes applied that an inspection of the whole of the tunnelling upon Contracts 79 and 79A might be made by Mr. George M'Credie.

Mr. Hickson having nominated Mr. Davis, Principal Engineer, Sewerage Construction, to represent the Department at the inspection, it was arranged that it should be made on the following day.

Mr.

Mr. Parkes applied that Messrs. Carter, Gummow, & Co. might be requested to produce the letters patent, or assignment of the letters patent, or such evidence as they might possess of their authority to hold or deal with the patent of the Monier arch system; also their account books, covering their transactions for the last three years.

Mr. Gummow explained that the firm had no partnership accounts, and that no books were in existence except the bank-books. He could produce a copy of the patent right for the Monier arch.

His Honor directed the production of the bank-books of the firm for the period named by Mr. Parkes; also a copy of the patent right for the Monier arch.

Mr. Parkes handed in to His Honor the following additional charges in reference to Contracts 60 and 61:—

*Contract No. 61.*

With allowing defective work to be performed, by which a great loss was sustained by the Crown; and with not making any effort to recover from the contractors, Messrs. Carter, Gummow, & Co. the moneys so lost.

*Contract No. 60.*

With allowing defective work to be performed, by which a great loss was sustained by the Crown; and with not making any effort to recover from the contractors, Messrs. Carter, Gummow, & Co., the moneys so lost.

Frank Moorehouse Gummow, William Darcus, Thomas Wright, Patrick Hartford Kenna, and William Henry Warren were sworn and examined.

His Honor, at 1:45 p.m., adjourned the inquiry until 10 a.m. on Friday, 12th June.

C. E. R. MURRAY,  
Commissioner.

*FRIDAY, 12 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction; Mr. Norrie, Bond Clerk; and Mr. Thomas Griffiths, Assistant Engineer, Water and Sewerage Board, also attended.

Robert Rowan Purdon Hickson and George M'Creddie were recalled and further examined.

William Thompson and Thomas Griffiths were sworn and examined.

His Honor, at 1:15 p.m., adjourned the inquiry until 10 a.m., on Monday, 15th June.

C. E. R. MURRAY,  
Commissioner.

*MONDAY, 15 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Mr. Gummow handed in, by His Honor's direction, two bank-books, purporting to show the banking transactions of the firm of Carter, Gummow, & Co., from 4th August, 1892, until the present day.

Mr. Parkes withdrew from the list of charges he had handed in to His Honor the following charge:—

"That Robert Hickson, while being an officer of the Crown, viz., Engineer-in-Chief for Public Works, did act collusively with his son, George Hickson, a partner of the firm of Messrs. Carter, Gummow, & Co., whereby the said George Hickson obtained wrongfully, money belonging to the Crown,"

and substituted therefor the following:—

"That Robert Hickson, while an officer of the Crown, viz., Engineer-in-Chief for Public Works, did allow of undue concessions being granted to Messrs. Carter, Gummow, & Co., contractors, for sewerage works in the Colony of New South Wales, his son, George Hickson, being an interested party in the firm of Messrs. Carter, Gummow, & Co."

Mr. Smith, on behalf of Mr. Hickson, requested that he might be furnished with a list of the concessions referred to in Mr. Parkes' substituted charge.

Mr. Parkes said he would furnish the list in the course of the inquiry.

George Stanley Brown was sworn and examined.

Thomas Wright and Robert Rowan Purdon Hickson were recalled and further examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m. on Wednesday, 17th June.

C. E. R. MURRAY,  
Commissioner.

*WEDNESDAY, 17 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.  
Mr.



Mr. Smith said that Mr. Hickson had received from Mr. Parkes the following communication, having reference to the charge which he had substituted for the original charge concerning collusion between Mr. Hickson and his son:—"121, Pitt-street, Sydney, 15th June, 1896. To Robert Hickson, Esq. Dear Sir,—The concessions referred to in my charge, substituted this morning, are contained in Nos. 1, 2, 3, 4, and 7 of charges on Contract 69 and 1, 2, on Contract 72, and 1, 2, 3, of Contract 77, and 1, 2, 3, 4, 5, 7, 8, and 10 of Contract 79, and in 1, 2, and 4 of Contract 79A, and in 1 and 2 of Contract 118. Yours truly, VARNEY PARKES." He asked that a copy of this communication might be entered upon the minutes.

His Honor directed that this should be done.

Mr. Parkes requested that the bank-books of the firm of Carter & Co., as distinguished from the firm of Messrs. Carter, Gummow, & Co., might be produced.

His Honor directed Mr. Carter to produce the books referred to.

Mr. Carter, in reply to His Honor, said that he had retained in his possession only a few of the butts of the firm's cheque-books.

Mr. Parkes requested His Honor to obtain from the Auditor-General a memorandum of the payments made by the Treasury to the firm of Carter, Gummow, & Co. for the past ten years; also the dates of payment and the contracts in respect of which the payments were made.

His Honor said that he would request the Auditor-General to supply the required information.

Peter Ewing, George Maddison, and George Forster Hickson were sworn and examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m. on Friday, 19th June.

C. E. R. MURRAY,  
Commissioner.

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*FRIDAY, 19 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Mr. Carter handed in five bank pass-books in connection with the account of Carter & Co.

John Carter was sworn and examined.

George M'Credie, William Thompson, and Frank Moorehouse Gummow were recalled and further examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m. on Monday, 22nd June.

C. E. R. MURRAY,  
Commissioner.

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*MONDAY, 22 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

His Honor, having ascertained that Mr. Parkes did not desire further to examine Mr. Hickson, junior, released him from attendance.

Mr. Carter handed in certain books and accounts of the firms of Carter & Co. and Carter, Gummow, & Co., in part compliance with the request of His Honor that the production be made of pay-sheets, butts of cheque-books, and all other acknowledgments for payment as disclosed by the firms' bank-books for the past four years, viz.:—One pay-sheet book, two summary pay-books, one petty-cash book, two bundles of pay-sheets, two bundles of loose accounts, five butts of small cheques (commencing end of December, 1895).

John Carter and William Thompson and Christian Herman Ohlfsen-Bagge were recalled and further examined.

James Mitchell was sworn and examined.

His Honor, at 1.15 p.m., adjourned the inquiry until 10 a.m. on Wednesday, 24th June.

C. E. R. MURRAY,  
Commissioner.

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*WEDNESDAY, 24 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith, solicitor (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parfitt handed in, in compliance with a request by His Honor, cheques upon the accounts of Carter & Co. and Carter, Gummow, & Co., for the period from 1st January, 1892, to date; also deposit slips for the same accounts for the same period.

His Honor, at the request of Mr. Smith, representing Mr. Hickson, directed the production by Mr. Parkes of a written statement alleged to have been handed to him by a member of one of the deputations of contractors which waited upon him at Parliament House.

James Mitchell and Joseph Davis were recalled and further examined.

George Scott Chiene and William Gilliver were sworn and examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m. on Friday, 26th June.

C. E. R. MURRAY,  
Commissioner.

*FRIDAY,*

*FRIDAY, 26 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes requested that His Honor would direct the production by Mr. Carter of a return showing the number of casks of cement purchased for use upon Contracts 79 and 79A and 69, the firms from whom the cement was purchased, and the amount paid for the same.

Mr. Carter said that he could not produce the particulars required of him; he could, however, hand in a list of the firms from whom the cement was purchased.

Mr. Parkes requested, with reference to the witness John Reid, who had been summoned to attend that day on His Honor's suggestion, that he should be first examined by His Honor, by Mr. Hickson or his representative, and by Mr. Gummow; and that he himself might be afterwards allowed to cross-examine him.

His Honor acceded to the request.

John Carter and James Mitchell were recalled and further examined.

John Reid, George Forrest, and Harold Francis Norrie were sworn and examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m. on Monday, 29th June.

C. E. R. MURRAY,  
Commissioner.

*MONDAY, 29 JUNE, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Mr. Gummow asked His Honor for permission to take from the custody of the Commission a book containing current pay-sheets, a book containing piecework payments, and also a petty-cash book, for use in the firm's current business transactions.

His Honor acceded to the request.

Frank Moorehouse Gummow, John Carter, and Harold Francis Norrie were recalled and further examined.

John Mann, Henry Armstrong, John Young, Walter Smith, and Norman Selfe were sworn and examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m. on Wednesday, 1st July.

C. E. R. MURRAY,  
Commissioner.

*WEDNESDAY, 1 JULY, 1896.*

His Honor sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. Hickson), Mr. Carter, and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

James Connors and William Owen were sworn and examined.

Norman Selfe, John Carter, George Dawson, Cecil West Darley, and Robert Rowan Purdon Hickson were recalled and further examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m. on Friday, 3rd July.

C. E. R. MURRAY,  
Commissioner.

*FRIDAY, 3 JULY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

The bank pass-books of the private accounts of Mr. Carter, Mr. Gummow, and Mr. Forrest were handed in by Mr. Carter.

His Honor, referring to a request which had been made by Mr. Parkes on the preceding day, that certain plans might be printed as appendices to the evidence, said that he had been doubtful whether it was fair to the public that the State should be put to the expense of having these plans printed, considering the enormous cost which would be entailed thereby; but now that the Premier and Colonial Treasurer had had a conversation with him, and had informed him that he need not study the question of expense of that kind, if the addition of the plans to the appendices would make the entire document more full and satisfactory, as of course would be the case, he was quite prepared to adopt the suggestion. Inasmuch as it appeared that the Government did not wish to save expense in any such way, he considered he was justified in ordering the plans to be printed. Under ordinary circumstances he should have been only too glad to direct that they be printed, because he would much rather have them printed than not; but at the same time he had thought it hardly fair to run the country into an expense of possibly £300 or £400 in connection with these plans. He was very glad that he had received the communication which had been made to him by the Premier and Colonial Treasurer, because it set the question at rest.

Mr. Parkes thought that His Honor was very wise in determining to have the plans printed, because there could be no doubt but that the evidence would be incomplete without them. Mr.

Mr. Parkes applied for an order to view some forty deposit slips in connection with the account of Mr. Hickson at the Bank of Australasia, as disclosed by his bank pass-books.

His Honor said that he would give the order applied for.

Mr. Parkes asked that Mr. J. Bryant, a witness who would be examined that day, might be allowed to peruse documents in the department having reference to payments on account of the Monier arch culvert on the Parramatta Road.

His Honor gave the permission asked for.

Mr. Smith inquired whether Mr. Parkes intended to call any further evidence with reference to the concessions made to Messrs. Carter, Gummow, & Co. by the department on account of the connection of Mr. Hickson, junior, with the firm.

Mr. Parkes said that he was doing his best to bring that particular part of his case to a close.

Mr. Smith said that it would be more convenient if Mr. Hickson could know from day to day the nature of the evidence which Mr. Parkes proposed to tender, because his duties in the department were of such a nature as to demand his close attention, unless it were absolutely necessary that he should be present at the proceedings of the Commission.

His Honor thought it would be impossible for this information to be furnished.

Mr. Smith said he would also like some information, if it could be supplied to him, as to the period over which it was probable the inquiry would extend.

Mr. Parkes said that he was certainly not wasting any time in the preparation of his case, and he feared that he could not get ready for the three weekly sittings of the Commission more evidence than was being then taken.

Robert Stewart Littlejohn, James Conley, and Thomas William Bryant, were sworn and examined.

George Forrest, George M'Credie, Cecil West Darley, William Thompson, Christian Herman Ohlfsen-Bagge, John Carter, and Harold Francis Norrie, were recalled and further examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m., on Monday, 6th July.

C. E. R. MURRAY,  
Commissioner.

*MONDAY, 6 JULY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Richard Butler Rigg, George Alexander Wilson, William Joseph Larkin, Joseph Barling, James Henry Young, and Edward Hungerford, were sworn and examined.

Harold Francis Norrie was recalled and further examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m., on Wednesday, 8th July.

C. E. R. MURRAY,  
Commissioner.

*WEDNESDAY, 8 JULY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

George Christie, Thomas Robert Steele, and James Symonds were sworn and examined.

John Carter, George McCredie, William Thompson, and Harold Francis Norrie were recalled and further examined.

His Honor, at 1 p.m. adjourned the inquiry until 10 a.m., on Friday, 10th July.

C. E. R. MURRAY,  
Commissioner.

*FRIDAY, 10 JULY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews advising), attended.

Mr. Joseph Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes asked His Honor to direct the production by Mr. Carter of a statement showing all the properties held by the firm of Carter, Gummow, & Co.; also the mortgages (if any) upon the same, and the name of the mortgagees; also the private property of Mr. Carter mortgaged to Mr. Weedon, together with a statement of the fixed deposits in the name of the firm in any bank.

His Honor directed the production of the statement.

Mr. Parkes applied that Mr. Gillan might be requested to make an affidavit showing the same particulars with reference to his own private property.

His Honor directed that a letter be forwarded to Mr. Gillan, requesting him to furnish the desired information in the form of an affidavit.

Mr. Parkes applied for the production of the bank pass-books in connection with Mr. Hickson's private accounts from the years 1888 to 1891 inclusive.

Mr. Smith said there would be no objection to the production of the books.

His Honor directed that the books be produced.

Mr.

Mr. Hickson desired to know when the bank pass-books and cheque butts which he had left with His Honor for the use of the Commission would be returned to him. They had now been in the custody of His Honor for over ten days, and he thought that was long enough to permit of a thorough examination of them.

His Honor said he understood that Mr. Parkes required to make further use of the books referred to, and he could not, therefore, direct that they be returned to Mr. Hickson.

Mr. Smith applied that Mr. Christie, who had given evidence at the preceding sitting of the Commission with reference to the quantity of cement purchased by Carter, Gummow, & Co. from various merchants in the city, might be requested to produce the data upon which his returns were based.

Mr. Parkes objected to the production of these data until corresponding returns had been furnished by Messrs. Carter, Gummow, & Co., and said that the production of these papers by Mr. Christie at the present time might seriously interfere with investigations which were in progress.

His Honor said that Mr. Christie was liable to cross-examination as to every part of the return which he had furnished; but it would be much better for the witness to produce copies of the extracts from the account books and ledgers upon which he had founded his calculations. He would therefore direct Mr. Christie to produce copies of these extracts.

Mr. Parkes applied that the merchants named in Mr. Christie's report might be requested to produce the ledgers from which the extracts had been made.

His Honor said that unless the accuracy of the extracts was challenged he did not think it would be expedient to make such an order.

Thomas William Bryant, James Symonds, George Christie, and John Carter were recalled and further examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m., on Monday, 13th July.

C. E. R. MURRAY,  
Commissioner.

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*MONDAY, 13 JULY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith, solicitor (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes applied that His Honor would direct the production by the Bank of Australasia of copies of the banking accounts of Mr. George Forster Hickson with the branches of the Bank in Sydney and Adelaide, from the year 1890 to the year 1896 inclusive.

His Honor acceded to the request.

George Christie and John Carter were recalled and further examined.

Henry Melville, Stephen Henry Weedon, and George Edward Hudson were sworn and examined.

His Honor, at 1:30 p.m., adjourned the inquiry until 10 a.m., on Wednesday, 15th July.

C. E. R. MURRAY,  
Commissioner.

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*WEDNESDAY, 15 JULY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith, solicitor (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes asked His Honor to make an order for the production of the bank pass-books in connection with the banking account of Mr. Davis from the year 1890 to date.

His Honor directed the production of the books.

Mr. Parkes applied that the Public Works Department might be directed to produce the registers of all minutes and letters in connection with the Sewerage Branch from 1883 to 1890 inclusive; also the letter books of the branch for the years 1891-2.

His Honor directed the production of the books.

Joseph Davis, John Carter, George Edward Hudson, and George Christie, were recalled and further examined.

William Kenwood and William John Lyne were sworn and examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m. on Friday, 17th July.

C. E. R. MURRAY,  
Commissioner.

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*FRIDAY, 17 JULY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith, solicitor (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes applied that he might have access to papers in the custody of the Commission during any hours which might be considered necessary.

His Honor acceded to the request.

George McCredie, William Edward Warren, William Thompson, and Joseph Davis were recalled and further examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m., on Monday, 20th July.

C. E. R. MURRAY,  
Commissioner.

*MONDAY, 20 JULY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Smith desired to ascertain whether it was the intention of Mr. Parkes to tender any further evidence in relation to the charge attributing to Mr. Hickson corruption in connection with the employment by the firm of Carter, Gummow, & Co. of his son. Mr. Parkes had intimated some days previously that he had intended to proceed at once with the whole of the evidence concerning that charge until it was completed, but since then he had called evidence in relation to other matters. The expense of being represented by a solicitor at the inquiry was a matter for serious consideration with Mr. Hickson, and if he understood that no further evidence would be adduced with reference to the charge referred to he would probably be advised that he should not be represented at the inquiry by a solicitor any further.

Mr. Parkes said that it would be impossible for him to say that he had completed the evidence relating to any portion of his case until the entire case was concluded.

His Honor said he could quite understand that Mr. Parkes was not in a position to say that he had definitely concluded any one part of his case, because he might possibly discover other evidence later on which he might consider it desirable to call. He understood that if Mr. Parkes failed to discover such evidence he had concluded the portion of the case referred to.

Mr. Parkes said he would undertake to give Mr. Hickson notice of the calling of any further evidence in reference to the portion of the case referred to, or in regard to any other important points.

His Honor said he thought that that was quite as much as Mr. Parkes could be asked to do.

George Dawson, John Carter, William Gilliver, and Walter Alexander Smith were recalled and further examined.

William Scarlett Delisle Roberts and Peter Parfitt were sworn and examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m., on Wednesday, 22nd July.

C. E. R. MURRAY,  
Commissioner.

*WEDNESDAY, 22 JULY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Hickson (Mr. Ernest Smith, solicitor, advising); Mr. Carter, and Mr. Gummow, of the firm of Carter, Gummow & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

James Gregg was sworn and examined.

George Christie, Joseph Davis, and Thomas William Bryant were recalled and further examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m. on Friday, 24th July.

C. E. R. MURRAY,  
Commissioner.

*FRIDAY, 24 JULY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising), and Mr. Carter, of the firm of Carter & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

The Secretary read an instrument under the hand of His Excellency the Governor, extending His Honor's Commission for a period of one month from the 21st July.

The Secretary read a communication from the Government Printer, drawing attention to the large quantity of type standing in the evidence taken before the Commission, and pointing out that, unless some of the type were released immediately, it would be impossible to keep pace with the work without seriously interfering with the ordinary business of the department.

His Honor said that the Secretary having made inquiries of the Government Printer, it appeared that it would be necessary for the purpose of releasing a quantity of type, to desist from taking evidence in connection with the Commission for some days. He hoped that he would be in a position to resume the taking of evidence on Wednesday next. If the printing of the evidence were allowed to fall into arrear injustice would be done to everyone affected by the inquiry, because in that case it would be impossible for them to follow the evidence from day to day, so as to ascertain in what position they stood in relation to the case, as it might be called. The best course under the circumstances, he thought, would be to adjourn for a few days.

Mr. Parkes said that, with reference to a letter which had been received from the Assistant Manager of the Bank of New Zealand, as to obtaining from the Adelaide Office of the bank a statement of the account of Messrs. Carter, Gummow, & Co., with that branch, and also the relative vouchers, and an intimation from the Bank that the manager of the Adelaide branch would probably decline to send his vouchers out of the Colony, but that Messrs. Carter, Gummow, & Co., might, at His Honor's request, be willing themselves to produce their Adelaide pass-book, and obtain for His Honor any voucher which might be specially desired,—he would apply for an order upon Messrs. Carter, Gummow, & Co., to produce for the use of the Commission their bank pass-books in connection with their Adelaide account.

Mr. Carter said he would like to know for what reason Mr. Parkes wished the books produced. There would be no difficulty in obtaining the books, but he might be able to give Mr. Parkes the information he desired directly without going to the trouble which would be involved in obtaining the books and vouchers. He might also state that no transactions between the firm and the Department of Public Works in New South Wales would be found to be included in the Adelaide bank-books.

His

His Honor said that if there was any information which Mr. Parkes could obtain directly from Mr. Carter he would ask him to mention what it was. He need not state the object of obtaining the information; but it would be simpler to procure it, if possible, in the way indicated, instead of going through a large number of documents.

Mr. Parkes said it would be difficult for him, without committing himself, to furnish the particulars of the information referred to. He wanted to follow certain payments and transfers of money from one account to another, and he could not go into those particulars without anticipating his case. He did not think Messrs. Carter & Co. should offer any objection to the production of the bank pass-books asked for.

Mr. Carter said there had been a great deal of investigation into the private affairs of the firm, and, while anxious to afford the Commission every assistance, and Mr. Parkes all the information he required, he thought there should be some limit to the investigation.

His Honor said that Mr. Parkes had shown no inclination to go into private matters which had cropped up in connection with the bank pass-books already produced, so that he did not think the fact that the books referred to might contain private matters would be sufficient ground for not asking for them. He would therefore ask for their production. If there were any special voucher which Mr. Parkes might find, upon an examination of the books, it was expedient he should see, he would ask Mr. Carter to request the bank authorities in Adelaide to hand over the voucher referred to.

Mr. Carter said that if it were thought necessary he would hand in a balance-sheet showing the state of Messrs. Carter, Gummow, & Co.'s affairs. From the trend of the inquiry a certain amount of doubt had been thrown upon the financial position of the firm, and any information which would relieve the public mind of that doubt he would be very glad to afford. The firm did not wish such an impression to get abroad.

His Honor said that if such an impression had been conveyed he presumed that the more the matter was ventilated the more the impression would be removed. He would not say anything at present as to the production of a general statement showing the position of the firm's affairs. He would merely ask for the production of the bank pass-books referred to.

His Honor said that he would not formally adjourn the proceedings of the Commission until Wednesday next. It was highly probable they would not be in a position to resume the taking of evidence then, and, if that were so, those affected by the inquiry would receive an intimation from the Secretary. In the meantime he would attend at the Board-room on Monday next to hear any applications which it might be thought expedient to make.

George M'Creddie and William Thompson were recalled and further examined.

C. E. R. MURRAY,  
Commissioner.

*FRIDAY, 31 JULY, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

William Scarlett DeLisle Roberts, George M'Creddie, James Symonds, John Carter, and Joseph Davis were recalled and further examined.

His Honor, at 1:10 p.m., adjourned the inquiry until 10 a.m. on Monday, 3rd August.

C. E. R. MURRAY,  
Commissioner.

*MONDAY, 3 AUGUST, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes requested His Honor to direct Mr. Carter to furnish the following books and papers in relation to Contracts 77 and 118, viz.:—One book (summary pay), one book (petty-cash), pay-sheets following No. 24 (since 1st June), and the paid and unpaid accounts. He would also like to know when Mr. Carter would be in a position to produce the bank pass-books of the firm of Gummow and Gillan, and also the bank pass-books of the firm of Carter, Gummow, & Co. in connection with their Adelaide account.

His Honor requested Mr. Carter to produce the books referred to as soon as practicable.

Mr. Carter said that he was expecting to receive from Adelaide the bank pass-books in connection with the account of Messrs. Carter, Gummow, & Co. in Adelaide. So far as the bank pass-books in connection with the account of the firm of Gummow and Gillan were concerned, he had not been aware that they were required. He would endeavour to obtain them, but it was quite likely that they were not in existence, seeing that firm itself had ceased to exist four years ago.

William Henry Warren, Joseph Davis, and William Thompson were recalled and further examined.

His Honor, at 1:20 p.m., adjourned the inquiry until 10 a.m. on Wednesday, 5th August.

C. E. R. MURRAY,  
Commissioner.

*WEDNESDAY, 5 AUGUST, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr.

Mr. Parkes requested His Honor to direct the production by the Department of Public Works of the last certificate in connection with Contract 77, and also the inspector's reports showing the state of the work up to date.

His Honor directed the production of the documents.

Mr. Parkes intimated that as the inquiry promised to occupy so great a length of time he had determined to limit it, so far as he was concerned, to the four contracts with which he had already dealt, viz. :—79, 79A, 69, and 77. In making this statement he would ask His Honor to bear in mind that he himself, in the examination of witnesses, had occupied not nearly one-half of the time which had been consumed. The officers representing the Department of Public Works, instead of waiting for the proper opportunity to reply to his case, had thought fit, in the examination of his witnesses, to introduce new matter, and that had occupied a great deal of time.

His Honor said that the course which had been adopted had been somewhat confusing, but had been very natural and proper, because it might happen that, unless a witness were examined at the present time, the opportunity to examine him might be lost to the department at a later date. He would ask Mr. Parkes to say whether he had any idea as to how long the inquiry would be likely to last, so far as his part of it was concerned.

Mr. Parkes said that the inquiry had thrown upon him a great deal of work of an exceedingly exacting nature, necessitating his application to it day and night, and he was afraid that if he were to enter into all the contracts concerning which His Honor was empowered to make inquiry, the investigation would last as many years as there were contracts. Having made this discovery, he had determined to curtail the inquiry as far as practicable.

His Honor said he asked the question in view of an application for a further extension of his Commission.

Mr. Parkes said that a great deal of the evidence of a purely technical nature which had been taken was necessitated by the contractors having no books, and this circumstance tended to materially lengthen the evidence. He thought it would take him about one month to conclude the examination of his witnesses.

His Honor said that under the circumstances he would be justified in asking for an extension of his Commission for two months, although, of course, the application might not be granted.

Mr. Parkes said he did not see how he could submit more evidence than he was submitting at the present time during the three-hour sittings of the Commission on Mondays, Wednesdays, and Fridays. He found that it took him the whole of the intermediate days to prepare his evidence for the next sitting of the Commission.

His Honor said that it was also obvious that the printing of a greater quantity of evidence than was being taken at the present time would not be practicable if the printing were to keep pace with the inquiry.

Joseph Davis, William Henry Warren, John Carter, George M'Creddie, and William Thompson were recalled and further examined.

His Honor, at 1:35 p.m., adjourned the inquiry until 10 a.m. on Friday, 7th August.

C. E. R. MURRAY,  
Commissioner.

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FRIDAY, 7 AUGUST, 1896.

His Honor, the Commissioner, sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising) ; Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes inquired of His Honor whether the Commission was yet in receipt of the bank pass-books of the firm of Carter, Gummow, & Co. in connection with their Adelaide account.

Mr. Carter said that he was in receipt of a letter from Mr. Gummow in which he stated that he had instructed the bank to forward the pass-books fully a week ago. He was under the impression that the books might have been sent to the head office of the bank. He had expected that they would have been in the hands of the Commission on the last sitting day.

His Honor said it was not unlikely that the books would be sent to the head office of the bank, and he would ask Mr. Carter to make inquiry and ascertain whether that was so.

Mr. Davis said that he was in receipt of a communication from Mr. Smail, from which it was to be inferred that something in the nature of testing had been going on upon the northern main sewer at the Glebe. He did not know whether the work had been done at Mr. Parkes' instance or not. He would assume that he (Mr. Parkes) had no connection with it. At the same time, it was an improper thing that any work of that nature should have been done without the knowledge of the department. It had been found that someone had been testing the work at the Glebe contract by removing portions of the cement rendering and putting holes through the concrete.

Mr. Parkes said that he was in absolute ignorance of any tests of that description.

His Honor presumed that Mr. Parkes would not think of having such a thing done without asking his authority.

Mr. Parkes said that he had no knowledge whatever of the testing referred to. He had asked, some time ago however, that some steps should be taken by His Honor to obtain an inspection of this particular sewer.

His Honor said that, as the sewer was in use, there would be a certain amount of difficulty attending an inspection.

Mr. Parkes said that he was quite prepared to nominate a practical man who would make an inspection if Mr. Davis would nominate another, so that a joint inspection could be made.

His Honor said that if Mr. Parkes would localise the points where defective work was alleged to exist, he would consider an application for an inspection. In the meantime he did not see how it would be practicable for anything to be done which would prevent an examination from being effective.

Mr. Carter said that although he was not in a position to afford precise information on the point, it had been rumoured that certain persons had been down into some of the sewerage works constructed by his firm. This had probably been done without the knowledge of Mr. Parkes. It was quite possible that there was some connection between the rumours which had reached him and the complaint now made by Mr. Davis.

His



His Honor said that if the police found anyone interfering in any way with the sewers without his authority, he hoped proceedings would be taken against the offending persons at once.

William Gilliver, John Carter, and John Young were recalled and further examined.

Alexander Dean and Thomas Williams were sworn and examined.

His Honor, at 1:35 p.m., adjourned the inquiry until 10 a.m. on Monday, 10th August.

C. E. R. MURRAY,  
Commissioner.

*MONDAY, 10 AUGUST, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes said he would like to know when the bank pass-books connected with the Adelaide account of Carter, Gummow, & Co. and the account of Gummow and Gillan would be forthcoming.

Mr. Carter said that he was in receipt of a letter from Mr. Gummow under date of 5th August, in which he said that the pass-books had been on the preceding Thursday addressed to Carter, Gummow, & Co. at North Shore. He had made inquiry, and could not find the books anywhere. Whether the books were in the hands of the Sydney branch of the bank or not he did not know. He was sorry that the books had not been forthcoming, but he had done all that he could to obtain them.

Alexander Dean, George M'Creddie, and William Thompson, were recalled and further examined.

Benjamin Rhodes and Samuel Butcher were sworn and examined.

His Honor, at 12:30 p.m., adjourned the inquiry until 10 a.m. on Wednesday, 12th August.

C. E. R. MURRAY,  
Commissioner.

*WEDNESDAY, 12 AUGUST, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising), and Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

William Thompson, James Symonds, Joseph Davis, George Christie, and Thomas Griffiths were recalled and further examined.

His Honor, at 1:5 p.m., adjourned the inquiry until 10 a.m. on Friday, 14th August.

C. E. R. MURRAY,  
Commissioner.

*FRIDAY, 14 AUGUST, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

John Charlton Graham, John Driscoll, George Rogers, Thomas Kady, and John Moore Smail, were sworn and examined.

John Carter and Joseph Davis were recalled and further examined.

His Honor, at 1:15 p.m., adjourned the inquiry until 10 a.m. on Monday, 17th August.

C. E. R. MURRAY,  
Commissioner.

*MONDAY, 17 AUGUST, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising), and Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. Joseph Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Christian Herman Ohlfsen-Bagge, John Moore Smail, and Thomas Williams were recalled and further examined.

His Honor, at 1:10 p.m., adjourned the inquiry until 10 a.m. on Wednesday, 19th August.

C. E. R. MURRAY,  
Commissioner.

*WEDNESDAY, 19 AUGUST, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising), and Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. W. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Carter handed in two bank pass-books in connection with the banking account of Gummow and Gillan. He stated that he was in a position to produce these two bank pass-books as the result of correspondence with Mr. Gummow, and that they were apparently the whole of the bank books which could be obtained.

James

James Morrison Dean and William James Millner were sworn and examined.  
William Gilliver, Joseph Davis, John Carter, and Edward Hungerford were recalled and further examined.

His Honor, at 1:20 p.m., adjourned the inquiry until 10 a.m. on Friday, 21st August.

C. E. R. MURRAY,  
Commissioner.

*FRIDAY, 21 AUGUST, 1896.*

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); and Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. W. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Richard Green was sworn and examined.

Joseph Davis, George Christie, and Joseph Barling were recalled and further examined.

Mr. Parkes intimated to His Honor that he intended to bring his case to a close on that day week, when he would ask to be sworn in order that he might make a statement.

Mr. Hickson inquired if the statement Mr. Parkes desired to make would be in the nature of a speech.

His Honor expressed the hope that Mr. Parkes would not introduce any argument into the statement he intended to make.

Mr. Parkes informed His Honor that he would confine himself to a statement of facts.

His Honor, at 1:5 p.m., adjourned the inquiry until 10 a.m. on Monday, 24th August.

C. E. R. MURRAY,  
Commissioner.

*MONDAY, 24 AUGUST, 1896.*

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising), and Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. W. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

His Honor expressed his regret that the Secretary to the Commission, Mr. B. H. Friend, who had been doing his work with great ability and zeal, was suffering from an attack of pleurisy; and announced that Mr. Charles Robinson, the principal shorthand writer of the *Hansard* staff, had very kindly allowed Mr. S. K. Johnstone to act for Mr. Friend in his absence.

William Caughey and William Burcombe were sworn and examined.

George Christie and Joseph Davis were recalled and further examined.

Mr. Parkes asked His Honor if he would be good enough to order the production of the whole of the papers in connection with the case of *McNamara v. the Minister for Works*, which Mr. Hungerford on Friday last had undertaken to get.

Mr. Davis explained that Mr. Hungerford had looked everywhere for these papers, but that he had been unable to find them.

His Honor said that if Mr. Hungerford had looked everywhere for the papers it would be of no use for him to make a further order.

Mr. Parkes desired His Honor to make a further order for their production, as he wished to close his case.

His Honor said he supposed that Mr. Hungerford would do his best to find the papers.

Mr. Parkes expressed the hope that His Honor would not hold him strictly to his undertaking to close his case on Friday next, and would allow him to bring in any matter which might overlap.

His Honor acceded to the request of Mr. Parkes.

Mr. Parkes, at a later stage, made an application to His Honor for an examination of the Glebe sewer between the shafts Nos. 11, 12, and 13, and also the sumps, and of shafts Nos. 8 and 9. He stated that shaft 9 had been referred to by a witness named Chiene as a shaft at which a certain conversation took place between Byrne, Reid, and himself; that shaft No. 8 had been referred to that morning by a witness; and that the sumps at shafts Nos. 11 and 12 were supposed to have been improperly filled.

His Honor said he could hardly see the object of making an examination of these sumps. If it would mean taking out the concrete to a depth of 4 ft. 6 in. to try to discover whether there was stone in the bottom, below the limit of the concrete, it would be a very big job. There was very strong evidence to show that there were bits of bad work done. But, supposing that the work did not show any outward sign of bad filling, though that did not excuse the persons who did the bad work, still it would be rather a serious matter, in the interests of the public, to disturb the sewer. The question with which the Commission had to deal was only incidentally whether bad work was put in.

Mr. Parkes said His Honor had had evidence of bad work being put into the contract; and in view of the contradictory evidence which had been given he thought it would be well that some of this bad work should be tested. Dawson, a witness, had undertaken to take the Commission to a sump at Annandale, which was filled up with cement casks. The Commission had also had evidence, on hearsay certainly, that the work in the sewers was defective—for instance, in the Munni-street sewer, Alexandria.

Mr. Davis stated that he should be very glad to see the Munni-street sewer examined, as it would cause no inconvenience to anyone. He had intended to ask that it should be examined, if Mr. Parkes had not done so. In the case of Contract 65, beyond the evidence offered that morning that a few small pieces of shale were put in the bottom of a sump—which, if there, would not interfere in any way with the stability of the work—there was no direct evidence of bad work in the contract.

Mr. Parkes said it was most difficult to get workmen to give evidence as to defective work.

Mr. Carter said it was merely hearsay evidence. Men boasted of what they had done. Three parts of it was idle boasting.

His Honor said that if there was any direct evidence that a piano case had been put into a sump, and covered up with concrete, and the sump could be located, there would be something very definite to search for. There would be only a crust of concrete over the top of the defective work.

Mr.

Mr. Parkes said that if the sump was 7 feet deep, or even 6 feet deep, the piano case would take up only 4 ft. 6 in. He suggested to His Honor that where he had received evidence of defective work, and it turned out that there was defective work, it certainly should lead to the examination of the sewers affected.

His Honor said that where there was fair ground for locating the defective work it certainly should lead to an examination. As to examining the sump, was it difficult or practicable to do so?

Mr. Davis did not think it would be possible to do what Mr. Parkes asked should be done. Even supposing that all stone and no concrete had been put in, it did not interfere with the stability or utility of the work. It was quite out of the question to search for little bits of shale, which probably were put down behind the backs of the contractors.

His Honor: In point of fact it would be a swindle on the Department if done by the contractors; and, if done by the men, a swindle on the contractors and the Department to put shale in the bottom of the sump and cover that over with concrete?

Mr. Davis: Yes, your Honor.

His Honor: I suppose, if you were to rain shale or stone to within a foot of the surface, and to fill in with good concrete, practically the result would be very much the same?

Mr. Davis said it was Mr. Bagge's idea that these sumps should be filled with concrete. Since he left the Department they had been filled in with stone, with a course of concrete on the top. At the same time, if the stone was there, it was there, and it did not make any difference to the work. It was almost impossible to make the examination which Mr. Parkes desired; and, even supposing, when it was made, we found that what this witness said was correct, there was no object obtained.

Mr. Parkes said that his experience was that if bad work was put into one part of a work, it was put into all its parts.

His Honor said that as far as putting in the stone in the bottom of the sump was concerned, and as far as the suggestion went that pieces of timber, perhaps broken-up casks, were thrown into the sump, went, from the evidence he had heard, he was inclined to think that something of the kind did take place. Whether Carter, Gummow & Co., the contractors, had anything to do with it personally or not was another question; but that it did take place he was inclined to believe. It was hardly necessary to go searching in the bottom of these places for what probably he thought would be likely to be found. It was a very serious matter to break up the public sewers to the extent they would have to be broken up, and to go to this expense, which would have to be borne by somebody—by the country finally. He would appoint to-morrow at 10:40 a.m. for the examination of the invert of the storm-water channel at Alexandria. He would reserve his decision on Mr. Parkes' application until he had heard other evidence. On the whole he did not think an examination would be necessary.

Mr. Parkes said there would be no difficulty in examining the short shaft at Johnstone's Paddock.

His Honor did not think it would be safe or expedient to make an examination as the sewage was flowing in the sewer.

Mr. Parkes then desired His Honor to order the production of the Bank Pass-books of the firm of Gummow and Gillan from 1890 to date.

Mr. Carter said that in the absence of Mr. Gummow in Adelaide he had made a search in his house for bank-books in connection with the account of Gummow and Gillan, but that he was only able to find those which he had produced to the Commission.

His Honor desired Mr. Carter to make another search for the books.

His Honor, at 1:5 p.m., adjourned the inquiry until 10 a.m. on Wednesday, 26th August.

C. E. R. MURRAY,  
Commissioner.

*TUESDAY, 25 AUGUST, 1896.*

His Honor the Commissioner proceeded to Alexandria Park to examine the invert of the Sewer Contract, No. 61.

Mr. Varney Parkes, M.P., Mr. J. Davis, Engineer for Sewerage, Mr. Carter of the firm of Carter, Gummow, & Co., and Mr. Thomas Wright, attended.

According to arrangement several holes were drilled into the invert of the sewer by an employee of the firm of Carter, Gummow, & Co., the first hole being 6 feet from the outlet, the second hole 16 feet, and the third hole 36 feet.

C. E. R. MURRAY,  
Commissioner.

*WEDNESDAY, 26 AUGUST, 1896.*

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising), and Mr. Carter, of the firm of Carter, Gummow & Co. (Mr. W. Andrews, solicitor, advising) attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Thomas Wright was recalled and further examined. He stated that at the test of the depth of the concrete in the invert of the sewer, Contract 61, Alexandria, the drill was not worked in a proper manner; that a stone was kept in front of the drill; that he, with an experience of twenty years, could not have drilled the four holes, aggregating a depth of 3 ft. 4 in., through concrete in one-and-a-half hours; and that it would be more satisfactory if a small section of the concrete was cut out by two disinterested men.

Mr. Parkes asked His Honor to have a piece 1 foot square taken out.

Mr. Davis submitted that a very fair test of the sewer was made, and that if the shortness of concrete was there which Mr. Wright represented to be there, it would have been found.

His Honor said the drill seemed honestly to go down on to the bottom, and as to driving a stone in front of the drill through even very sound black soil, he did not think that was feasible.

Mr. Parkes thought the drill worked a wedge-shaped hole, and that there ought not to be a hard bottom at a depth of 11 inches if there was soil under the concrete.

His Honor said a contractor was bound to adopt 9 inches as a minimum; but it was quite possible that he might get 12 inches as a maximum occasionally.

Mr.

Mr. Parkes said that it would satisfy him beyond any possibility of doubt if a foot of concrete was taken out.

His Honor said of course it would be on the assumption that it was taken out in the right place, but that several distinct feet of the material would have to be taken out.

Mr. Parkes assured His Honor that he should be perfectly satisfied if a foot of the concrete was taken out in one position. He had been satisfied with yesterday's test until Mr. Wright made a statement to him that morning, backed up by a man who was used to concrete work.

His Honor asked if it was intended to call any witness to corroborate Mr. Wright's evidence.

Mr. Parkes said he did not intend to offer corroborative evidence. He thought it would be easy to test the statement without bringing other witnesses. Mr. Wright seemed to be very certain of his facts, and it would set all doubts at rest if His Honor would order a foot of the concrete to be cut out.

Mr. Davis said he would not object to the application if there was any reason to doubt the result of the work on the previous day, but, considering who the witness was, and believing, from his evidence, that he had a grudge against the Department, he did object.

Mr. Parkes expressed his willingness to have a foot of material taken out and replaced at his own expense.

Mr. Davis informed His Honor that Mr. Carter would prefer a foot of the concrete to be chopped out and brought to the Board-room.

His Honor said that if Mr. Wright was not present when it was done, and the concrete should turn out to be too thick, he might say that it had come from somewhere else.

Mr. Carter stated that he was willing to send out two men with Mr. Wright to take out the block.

His Honor asked Mr. Parkes at which point he would suggest that it should be taken out.

Mr. Parkes suggested that Mr. Wright should be allowed to put one point down.

His Honor stated that there ought to be present with Mr. Wright a man whose testimony could be taken without question of bias on one side or the other. Whatever might happen no one knew what Mr. Wright might say when he came back; he might tell the truth absolutely, or some new idea might come into his mind.

Mr. Parkes stated that he would at his own expense send out Mr. Thompson on his behalf, and would abide by his decision. If a block was cut out, and brought to the Board-room, there could be no doubt about the depth of the concrete.

His Honor said that, on that understanding, he would sanction its being done.

Mr. Parkes also undertook to pay the expenses of Mr. Carter's two men on the occasion.

Mr. Carter said he would not accept Mr. Parkes' offer.

John Brown was sworn and examined.

Thomas Williams, Joseph Davis, and Christian Herman Ohlfen-Bagge were recalled and further examined.

Mr. Norrie inquired of Mr. Parkes if he was to understand that his case would close on the next sitting day.

Mr. Parkes said it would, but that His Honor had agreed to allow him to bring in some evidence afterwards, which he had endeavoured to get, but which the delay in finding witnesses had prevented him from getting.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m., on Friday, 28th August.

C. E. R. MURRAY,  
Commissioner.

*FRIDAY, 28 AUGUST, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. R. R. P. Hickson); Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Edward Hungerford and Joseph Davis were recalled and further examined.

William Allen and Edward Moore were sworn and examined.

Mr. Parkes said he had no other witness to call, but he would like to make a statement on oath as to the reasons why he had asked for the inquiry. He anticipated from their examination of his witnesses that Mr. Hickson or his representative would desire to cross-examine him as to motives; and he wished to give them the fullest opportunity of doing so by making a statement.

His Honor said it would be better, on the whole, if Mr. Parkes would confine himself to facts, because his motives were not at all material. He did not assume that Mr. Parkes had any wrong motive, and, even if he had, it would not have anything to do with the question before the Commission.

Mr. Parkes observed that he wished to give a history of the information as laid before him.

His Honor said he understood that it would be a history of facts.

Varney Parkes was sworn and examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m., on Monday, 31st August.

C. E. R. MURRAY,  
Commissioner.

*MONDAY, 31 AUGUST, 1896.*

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. R. R. P. Hickson); and Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr.

Mr. Parkes said that from the manner of Mr. Smith's cross-examination of himself it was clearly indicated that it was intended ultimately to take some action; and he submitted to His Honor that if Mr. Smith intended to take action for libel, or anything of that sort, the proper place for him to be questioned on certain subjects upon which he had been questioned was in a court of law.

His Honor said that what Mr. Parkes said before the Commission was absolutely privileged, except in the case of a prosecution for perjury. He did not suppose that Mr. Smith had it in his mind to take any civil action.

Mr. Smith and Mr. Hickson each answered that he had it not in his mind to do so.

His Honor said that on reflection he had come to the conclusion that it would be more proper that Mr. Smith should be allowed, on cross-examination of Mr. Parkes, to go fully into the question of motive and belief. Although he did not think that he would be entitled to deal with these questions in his report, still he thought that in this inquiry he ought to go into all questions which might in future have to be dealt with by the Executive, and it would be a pity to leave unsettled anything which the Executive might have to inquire into. In this relation he would call attention to the statement made by the Premier in the House relating to what might be called the question of costs. This cross-examination might be relevant to that question. Whatever answers might be given, or whatever deductions might appear proper to be drawn from such answers and from the facts—whatever his report might be, one way or the other—he might not feel justified in coming to a conclusion on this matter himself; but, as he had formerly stopped Mr. Smith from going into the question, he now concluded that it would be better, on the whole, to say that he would put no hindrance in the way of Mr. Smith's doing so.

Mr. Parkes said that, in accordance with the understanding with His Honor, he proposed to amend the charges, to withdraw some of them, and to put others in.

His Honor stated that he would allow Mr. Parkes almost any latitude by way of amendment or addition, and, at the same time, he would allow full latitude to anyone else to reply, at any stage, to any evidence which Mr. Parkes might have produced. He would again ask Mr. Parkes to try to keep the inquiry within reasonable limits.

Mr. Varney Parkes was recalled and further examined.

Mr. Smith desired to know at this stage which of the charges Mr. Parkes would like to withdraw.

Mr. Parkes said he would like the charges to stand for a week longer.

His Honor said he did not think it was fair to ask Mr. Parkes to withdraw any charges. It was for Mr. Smith and all the parties concerned to exercise their own discretion as to what evidence they would call to rebut a charge, or to modify the effect of evidence, or to explain away the effect of evidence which had been given.

Mr. Smith said that he had not asked Mr. Parkes to withdraw any charges, but that if it was intended to modify or withdraw any of the charges, he would like to know as soon as possible what Mr. Parkes proposed to do.

Mr. Parkes intimated that at a later stage of the inquiry he would state his intentions.

His Honor said that if at any time Mr. Parkes should make up his mind to modify or withdraw any of the charges he would like him to do so at once.

Mr. Parkes stated that if on looking through the charges he saw any which he thought he ought properly to relinquish he would do so. He would tell His Honor on Wednesday what he proposed to do.

His Honor understood that Mr. Parkes had now provisionally closed his case.

Mr. Parkes said that he had.

His Honor, at 12:36 p.m., adjourned the inquiry until 10 a.m. on Wednesday, 2nd September.

C. E. R. MURRAY,  
Commissioner.

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WEDNESDAY, 2 SEPTEMBER, 1896.

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising); Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes said he would undertake to hand to His Honor not later than the following day the amended charges to which he had already referred.

Mr. Davis said that the examination of the sewer at Alexandria which had been directed to be made had been made on the previous morning. By means of a drill holes were made in what proved to be satisfactory concrete, going to a depth of 9 inches.

His Honor presumed that that would be without going through the full extent of the concrete.

Mr. Davis said that that was so.

His Honor asked how far from the mouth the holes had been made.

Mr. Davis said he was not in a position to say. He was not himself present at the examination, but Mr. Thompson might possibly be in a position to give evidence in regard to it, having been present.

Mr. Parkes asked for the production by the department of any correspondence as to sureties in the case of contracts carried out by Mr. Gilliver or Mr. Ahearn.

Mr. Norrie said he did not recollect any correspondence in regard to personal sureties in the case of either of the contractors referred to, but he would see if there was any.

Varney Parkes and Joseph Davis were recalled and further examined.

His Honor, at 1:5 p.m., adjourned the inquiry until 10 a.m. on Friday, 4th September.

C. E. R. MURRAY,  
Commissioner.

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FRIDAY, 4 SEPTEMBER, 1896.

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising); and Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes handed in a list of charges, which he said he desired now to stand as containing the whole of his charges in an amended form.

His Honor asked whether the charges Mr. Parkes had now handed in contained anything by way of addition, or whether they were a repetition of the former charges in a modified form.

Mr. Parkes said that the charges which he now handed in were merely modified. There was nothing additional.

Mr. Hickson said he would like to know whether the charges contained anything to require the taking of fresh evidence.

Mr. Parkes said that the charges were practically the same charges which he had handed in before, except that they were in a different form.

The Secretary, by His Honor's direction, read the charges as follows :—

CHARGES based upon statements made in the Legislative Assembly of New South Wales as to the improper conduct on the part of the Public Works Department in connection with contracts of Carter, Gummow, & Co., and referred by the said Legislative Assembly to a Royal Commission for inquiry and report.

*Contract 69.*

1. With allowing Messrs. Carter, Gummow, & Co. to manipulate the Department's schedule for Sewerage Contract 69 so as to give the contractors an advantage over the Crown in their contract to build a sewer in Marrickville, by which the contractors were paid upon the extravagant items of charge, and were conceded those items upon which they had a losing price.
2. With allowing the contract to be taken up by Carter, Gummow, & Co. with an insufficient bond, and with ultimately breaking that bond by remitting the retention money, and writing a minute by which the Minister was deceived and induced to consent.
3. With paying to the contractors large sums of money which they (the Departmental officers) were not compelled to pay under Carter, Gummow, & Co.'s contract with the Crown.
4. With advancing to the contractors sums of money improperly and in violation of the terms of the contract, and without sufficient security.
5. With incompetency in carrying out and administering the contract.
6. With failing to comply with the orders of Parliament, and placing documents on the Table of the House in a manner calculated to mislead Honorable Members of the Assembly.
7. With allowing defective work to be put in the works, by which a loss is sustained by the Crown.

*Contract 72.*

1. With paying away large sums of money to the contractors, Carter, Gummow, & Co., which they (the Departmental officers) were not obliged to do under the contract conditions; and with settling a claim without a proper test as to the liability of the Crown for a sum of £4,050 9s. 6d. by obtaining the Minister's consent granting the contractors Contract 79 without re-tendering for that contract, when, in the interest of the Crown, it was the clear duty of the Department to do so.
2. With proceeding with works not contained in the contract, and paying for same out of contract vote; and with using unauthorised, in connection with contract, money voted for other contracts.
3. With withholding from the papers laid upon the Table of the House such documents as would allow Honorable Members of Parliament to understand the nature of the contract, and the manner in which it was carried out.

*Contract 77.*

1. With calling public tenders for Contract 77 upon plans for elaborate and costly work, and allowing Messrs. Carter, Gummow, & Co. to submit a plan of their own upon a patent held by them and an officer of the Department, and at their own price, unchecked by the Department as to real cost, by which Messrs. Carter, Gummow, & Co., got an advantage over the Crown of £4,000.
2. With deceiving the Minister as to the true cost of the Monier patent by minutes written by Robert R. P. Hickson, the then Engineer-in-Chief of the Department.
3. With deceiving the Minister, by which he (the Minister) accepted of certain security, which was of an improper and useless nature, for the stability of the patent for a term of three years, the deception being contained in minutes written by Robert Hickson, the then Engineer-in-Chief for Public Works, knowing that the security was not of a proper nature to submit.
4. With withholding the proper information concerning the above transaction from Parliament, by not laying plans and other papers upon the Table of the House when ordered to do so by Parliament.

*Contract 79.*

1. With improperly granting to Messrs. Carter, Gummow, & Co., without re-tendering, Contract 79, by which a loss was sustained by the Crown.
2. With allowing Messrs. Carter, Gummow, & Co. to manipulate the items in the schedule prepared by the Department, so as to increase the profits of the contractors to the loss of the Crown.
3. With returning the cash security and the retention fund to the contractors, in violation of the contract agreement and to the advantage of the contractor, and hazarding the interests of the Crown.
4. With the discharging of Inspector Reid from the above contract for simply doing his duty in the interest of the Crown by insisting upon good work and material.
5. With improperly paying an account of £350 6s. 8d. to the contractors for removing material which work they never performed.
6. With placing improperly to the account for payments on Contract 79 various items of payments for work done at Bondi.
7. With advancing, without sufficient security, the sums of money upon contract materials not in the possession of the Crown.

*Contract*

*Contract 79A.*

1. With inducing the Minister, on the plea of urgency, to let the above Contract 79A to Carter, Gummow, & Co. without tender, and upon Departmental estimate, by which a loss is liable to be sustained by the Crown.
2. With advancing a sum of money of the moneys of the Crown to the contractors upon insufficient movable security, and in violation of the contract between the contractors and the Crown.
3. With failing to place upon the table of the House the papers ordered by Parliament, by which Honorable Members might be misled as to the nature of the transactions.
4. With permitting defective work to be executed by the contractors, by which a loss is sustained by the Crown.

*Contract 118.*

1. With allowing defective materials to be used by the contractors, by which a loss is sustained by the Crown.
2. With allowing the contractors to have the benefit of labour performed by the unemployed, paid by the Crown, to drain the works of the contractors, which drainage the contractors have to take the responsibility of under their agreement with the Crown.
3. With omitting the necessary papers ordered to be laid upon the Table of the House of Parliament, by which Honorable Members were unable to judge of the manner in which the contract was conducted.

*Glebe Contract.*

1. With allowing defective work to be done, by which a large loss of money was sustained by the Crown, and with not making any effort to recover such loss from the contractors, Messrs. Carter, Gummow, & Co.

*Engineer-in-Chief for Public Works; Carter, Gummow, & Co.*

That Robert R. P. Hickson, while an officer of the Crown, viz., Engineer-in-Chief for Public Works, did allow of undue concessions being granted to Messrs. Carter, Gummow, & Co., contractors for sewerage works in the Colony of New South Wales, his son, George Hickson, being an interested party in the firm of Messrs. Carter, Gummow, & Co.\*

1. By permitting Messrs. Carter, Gummow, & Co. to obtain the monopoly of the Monier system in Government works by inducing the Minister to enter into an agreement to adopt their patent in public works, and to pay 15 per cent. royalty for use of same by an improper minute, inaccurately stating the cost of a special test made in connection with the same.
2. By permitting Messrs. Carter, Gummow, & Co. to obtain Contract No. 79 in an improper manner to the advantage of the contractor, and to the detriment of the Crown.
3. By permitting Messrs. Carter, Gummow, & Co. to obtain Contract No. 77 in an improper manner to the advantage of the contractor, and to the disadvantage of the Crown.

His Honor desired to know, the charges having been read, whether anyone interested in the inquiry wished to make any application founded upon them, or to ask him to take any course in consequence of their modification.

Mr. Smith said that he had not yet had time to consider the effect of the charges in their modified form. He suggested that the evidence should be proceeded with on this day, and that if, after thinking over the matter in the meantime, he thought fit to make any application it might be made on the following Monday.

His Honor said that that request was a reasonable one. The same right would be extended to Carter, Gummow, & Co.

Mr. Parkes desired to explain that some of the charges were introduced with the object of introducing further evidence, which might or might not be forthcoming. He, of course, reserved to himself the right to withdraw any of the charges later on.

His Honor said that if at any stage Mr. Parkes wished to withdraw any charge he would be at liberty to do so.

Mr. Parkes asked permission to call Mr. Christie as a witness, in order that he might furnish a report from the Commissioner of Taxation in New Zealand with reference to the financial position of Mr. Forrest. This communication had reached Mr. Christie from a private source.

His Honor said that he had made inquiry with a view to elicit information now referred to by Mr. Parkes, from another source. He had not actually applied for the information to the Commissioner of Taxation, but, under the circumstances, the sooner the evidence to which Mr. Parkes referred was put before the Commission the better.

George Christie, William James Millner, and Joseph Davis were recalled and further examined.

His Honor, at 12:30 p.m., adjourned the inquiry until 10 a.m. on Monday, 7th September.

C. E. R. MURRAY,  
Commissioner.

*MONDAY, 7 SEPTEMBER, 1896.*

His Honor the Commissioner sat at the Board-room Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes said that if he understood that he had a right to bring forward evidence in reply to that tendered by the department, he would be able to save a certain amount of time in the cross-examination of Mr. Davis.

His Honor said that while Mr. Parkes might be in a position to call evidence in reply to that tendered by the department, Mr. Davis would still have the right to be called again.

Mr. Parkes said the object he had in view was to obtain from Mr. Davis the data upon which he intended to put forward certain evidence.

His

\* Mr. Parkes, on October 9th, amended the clause by the omission of the words "his son, George Hickson, being an interested party in the firm of Messrs. Carter, Gummow, & Co."



His Honor said that he would ask Mr. Parkes to cross-examine the whole of the witnesses who could be cross-examined when they were first called, because it might happen that some of them might admit the correctness of the facts which Mr. Parkes wished to prove.

Mr. Smith said that, with regard to the substituted or modified charges which Mr. Parkes had tendered to His Honor on the preceding Friday, he had looked through them, and it appeared to him that some seven or eight of the original charges had been abandoned, and that two entirely new ones had been put forward. He referred to charge No. 2, affecting Contract No. 72, and to charge No. 1 of the general charges. First of all, he would like to ask Mr. Parkes a few questions in further cross-examination as to these charges, and in the second place he would ask His Honor to call upon Mr. Parkes to state whether he intended to call any witnesses in support of the two new charges. If Mr. Parkes intended to call further evidence it might be convenient to deal with the matter at once, before the Department proceeded any further with the evidence which it was now calling.

His Honor said that if Mr. Parkes had any evidence to tender in reference to the charges referred to by Mr. Smith he might tender it at once.

Mr. Parkes presumed that if he gave Mr. Smith twenty-four hours' notice of his intention to call evidence it would be sufficient.

His Honor said that the sooner the evidence was proceeded with the better, and he would ask Mr. Parkes to be ready with it as soon as he could, and at the same time to give Mr. Smith notice.

Mr. Smith said that the Department had not much further evidence to tender, and he would therefore ask Mr. Parkes to give him the earliest notice possible of any further evidence which he might desire to call. The Department intended to call only two or three witnesses in addition to Mr. Hickson, and their case would probably be concluded on Friday.

Mr. Parkes said that he would be ready with any further evidence he might see fit to tender on the following Monday at the latest.

Joseph Davis was recalled and further examined.

Charles Clymer was sworn and examined.

His Honor, at 1:15 p.m., adjourned the inquiry until 10 a.m. on Wednesday, 9th September.

C. E. R. MURRAY,  
Commissioner.

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*WEDNESDAY, 9 SEPTEMBER, 1896.*

His Honor, the Commissioner, sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes intimated his desire to make verbal amendments in several of his modified charges, and also to add the following charge:—

“With allowing faulty supervision of the contracts carried out by Messrs. Carter, Gummow, & Co., by which inferior concrete was supplied, making defective work, there not being the specified quantity of cement used, more particularly in Contracts 79, 79A, and 69.”

Mr. Parkes desired to know when Mr. Davis would be able to produce the list of contracts he had undertaken to produce, in which the fixed deposits were returned.

Mr. Davis said that he understood that Mr. Norrie would produce the necessary documents.

Mr. Norrie said he would like to know whether Mr. Parkes wished the whole of the papers in each individual case, or merely the contract documents.

Mr. Parkes said that he would like to have the contract documents, showing the date of the refund and also the reasons for the same.

Mr. Parkes said that Mr. Davis had undertaken to produce a list showing any further cases which had occurred in the Sewerage Department in which the retention money and fixed deposit had been returned to the contractors, in addition to the two cases mentioned in the list which had already been handed in.

Mr. Davis said that he had not stated that there were any additional cases. What he had stated was that a clerk had prepared a list which fairly represented the practice of the office. He did not know whether there were any additional cases as far as the Sewerage Department was concerned. If there were any such additional cases he would cause to be prepared a list in which they would be shown.

Mr. Parkes said he had also requested the production of the journal in connection with Contract 72.

Mr. Davis said that every search had been made for the journal to which Mr. Parkes had referred, but it could not be found. Mr. Hungerford had spent some hours in searching for the book, but it had not been found, and he really did not know what had become of it. It was thought at the time the journals were sent down to the Commission with other documents, that all the journals in existence had been forwarded.

His Honor thought it would be well to examine Mr. Hungerford as to what steps he had taken in making a search for the journal.

Mr. Parkes said Mr. Davis had also undertaken to produce the papers in connection with Contract 93, the first contract let under the new system of tendering.

Mr. Davis said he was not aware that he had undertaken to produce these papers, but they could be produced.

Mr. Parkes said he would also like to have produced the whole of the correspondence and minutes with reference to that particular contract.

Mr. Davis said that the Department would produce whatever papers there might be in reference to the matter.

Mr. Parkes said that he would ask His Honor to direct the production of the whole of the Inspector's reports upon the contracts of Carter, Gummow, & Co., which had been dealt with in the inquiry as to the cement which had gone into the work upon the various contracts.

Mr. Davis said that the whole of the Inspector's reports which were in existence had already been produced.

Mr.

Mr. Parkes asked whether there were any further records in the possession of the Department showing the quantity of cement which had been delivered upon the various contracts, apart from the test book.

Mr. Davis said that the inspectors invariably noted the cement which went into the various contracts, and the quantity would be given in the inspectors' weekly or daily returns, as the case might be. The whole of these returns had already been handed in.

Thomas Griffith and Joseph Davis were recalled and further examined.

George Alfred Fowle and George Chamier were sworn and examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m. on Friday, 11th September.

C. E. R. MURRAY,  
Commissioner.

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FRIDAY, 11 SEPTEMBER, 1896.

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising), Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising), Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co (Mr. Andrews, solicitor, advising) attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Parkes said that the witness Maddison and Inspector Reid desired to make statements to the Commission, and he would like to ascertain whether His Honor would have any objection to the statements being received at the present stage of the inquiry.

His Honor said that if, as he understood, the statements of the witnesses referred to were volunteered, there would be no objection to their being heard.

George Chamier, Robert George Reid, Joseph Davis, and Varney Parkes were recalled and further examined.

Joseph Husband and Arthur Edward Cutler were sworn and examined.

Mr. Parkes said that, with reference to various matters affecting Mr. Hickson which had occurred in South Australia, he would ask His Honor to ascertain from Adelaide, as far as practicable, the facts of the case.

Mr. Smith said he would state the facts shortly, as he understood them. A motion had been made in the Legislative Assembly for a Royal Commission to inquire into the circumstances connected with certain public works. The Commission was issued, and there was an inquiry. Prior to that, however, there had been some arbitration proceedings in the matter of Wells Bros.' contracts for Rivoli Bay and Kingston jetties, in which the award was against the contractors. In connection with the Commission to which he had referred, a report was presented with regard to various railway matters; but he had been unable to discover that there was any report with regard to jetties. The Department had telegraphed down to Adelaide for particulars of the report with a view to ascertain if there were any report beyond that which they had already obtained. They had not yet this information. He was informed by Mr. Hickson that he had not been examined by the Commission at all. A further report was referred to in one of the Parliamentary papers, which, as far as he could understand, was connected with the Annual Report of the Treasury. He alluded to a special report by Mr. Higinbotham. Those were the whole of the facts as far as he had been able to discover them.

His Honor suggested that the most convenient course would be for both the Department and Mr. Parkes to hand to the Secretary of the Commission a statement of the facts, so far as they had been able to discover them, and if, after perusal of these statements, he came to the conclusion that any further particulars were required, he would endeavour to obtain them.

Mr. Smith said that with reference to the new charge which had been handed in by Mr. Parkes at the last sitting of the Commission, he desired now to state that the Department had virtually closed their case so far as the old charges were concerned, with the exception of calling Mr. Hickson. Concerning the two or three last additional charges in the list which Mr. Parkes had handed in, no evidence had yet been tendered, as far as he could see, and he would ask that Mr. Parkes be now called upon to complete his case before Mr. Hickson was examined, so that he might be in a position to answer, as far as possible, the whole of the evidence brought against him.

Mr. Parkes said that the necessary researches for the production of evidence occupied some time; but as regards two of the charges referred to by Mr. Smith, all the evidence which, in his opinion, was necessary had already been produced. With regard to the shortage of cement, he had yet to adduce further evidence, but it could not be got ready very quickly. He thought he could be ready with it at the end of the following week. If the evidence were ready before he would have it called. He did not think, however, that the Department would find any necessity to call Mr. Hickson himself in order to reply to that evidence.

His Honor said he would again ask Mr. Parkes to be as expeditious as possible in producing any further evidence which he had to produce. He presumed that after Mr. Hickson had been called by the Department, Messrs. Carter, Gummow, & Co. would have some evidence to bring forward.

Mr. Gummow said that the evidence which his firm intended to bring forward would occupy perhaps three sitting days.

His Honor said that in an inquiry of this kind he could not draw the line as to where evidence on either side should cease, because new facts might at any time be discovered by any of the parties concerned.

Mr. Smith thought that a limit should exist somewhere, and he would suggest that His Honor should adjourn the Commission until Mr. Parkes was in a position to call all the evidence he intended to call. With all respect to His Honor, he must decline to go on with the evidence which the Department desired to put forward for the completion of this case until Mr. Parkes had tendered such further evidence as he desired to tender. With regard to the charge Mr. Parkes had handed in at the last sitting of the Commission, he submitted that up to the present time there had been no evidence whatever of faulty supervision. He was quite prepared to call engineers and inspectors who had been employed upon various contracts, if it were necessary, but at present he thought it absolutely unnecessary for him to call these witnesses. When he had heard the evidence which Mr. Parkes intended to call in support of the charge to which he had just referred it might be necessary to call some of these witnesses. In the meantime, he would ask His Honor to adjourn the Commission until Mr. Parkes was in a position to go on with his case, instead of calling upon the Department to answer further than they had already done.

His

His Honor said that the course suggested by Mr. Smith would be a very inconvenient one to adopt. The evidence had proceeded now for a long time, and he did not think any injustice would be done by his hearing Mr. Hickson's statement, reserving the right to the Department, of course, to call him again at any stage if any further evidence should be forthcoming concerning which he wished to make any statement. It might simplify matters if Mr. Parkes would state more definitely the nature of the additional evidence he intended to call. It seemed to him that if the evidence was connected with, for instance, the shortage of cement in the work, no harm could be done by stating generally the nature of the evidence. The only danger in stating beforehand anything concerning the evidence to be called was, so far as he could see, in the case of workmen, because it might be difficult to get men afterwards to come forward, assuming that they could disclose certain facts regarding either Carter, Gummow, & Co., or the Department.

Mr. Parkes stated that he intended to call what he considered conclusive evidence on the question of the shortage of cement. He intended to connect the Department with the shortage, but he could not, as far as that point was concerned, disclose any of the evidence he intended to call.

His Honor said it might possibly be the case that the evidence to which Mr. Parkes referred might require to be answered, and, if so, he would allow Mr. Hickson to be recalled. As to the other witnesses to whom Mr. Smith had referred, he could, if he thought fit, call them at as late a stage as he thought fit. He might, for instance, call them after Messrs. Carter, Gummow, & Co. had brought forward the whole of the evidence they proposed to tender. There would, therefore, be no necessity to adjourn the inquiry.

Mr. Smith said he understood that it was only with regard to the charge as to the shortage of cement that Mr. Parkes proposed to bring forward further evidence, otherwise he should object strongly to calling Mr. Hickson to answer the allegations against the Department at the present stage.

His Honor said he understood that the whole of the evidence which was capable of being called had been called.

Mr. Parkes said that that was the case.

Mr. Smith said that in that event his best course would be to proceed with the examination of Mr. Hickson on Monday, leaving out of that examination, however, any matters affecting the charge relating to the shortage of cement.

Mr. Gummow presumed that his firm would be in the same position as the Department in tendering further evidence during next week with regard to the shortage of cement, and that they would be permitted to allow the examination of witnesses upon that point to stand over until Mr. Parkes brought forward the whole of the evidence he had to adduce.

His Honor said there would be no objection to that course.

His Honor, at 1:20 p.m., adjourned the inquiry until 10 a.m. on Monday, 14th September.

C. E. R. MURRAY,  
Commissioner.

#### MONDAY, 14 SEPTEMBER, 1896.

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising), Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising), Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. Joseph Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

George Benson, Robert Rowan Purdon Hickson, and George Maddison were recalled and further examined.

George Christian Henry Rudolph and George Anselm Henry Rowney were sworn and examined.

Mr. Parkes said he thought that if the matters affecting Mr. Hickson's connection with the South Australian Government were gone into, the whole of the papers connected with them would have to be put before the Commission. In his opinion these matters had nothing to do with the inquiry. Mr. Hickson seemed to have come to misfortune as regards the Rivoli Bay and Kingston jetties in that Colony; but to show how little importance he attached to that matter, he might have made reference to it some eighteen months ago in connection with the Public Works Committee, but he did not. He foresaw that if these matters were entered upon it would be necessary for the Commission to obtain information from the various Ministers who had dealt with them in South Australia; also information as to what had taken place with regard to the jetties referred to since Mr. Hickson had left that Colony. There were also various witnesses now in New South Wales who had been connected with Mr. Hickson in South Australia at that particular time who would have to be called, and the whole process would involve a good deal of trouble and expense, to say nothing of the delay which would occur in closing the labours of the Commission. He thought it would be much better, therefore, if these matters were eliminated from the inquiry. If they were not eliminated the fullest particulars would have to be gone into.

His Honor said that he did not understand that the question of whether Mr. Hickson at some time or other in South Australia had made any engineering mistakes was in any way material to this inquiry. He understood that the reference which Mr. Parkes had made to matters which had occurred in South Australia suggested some improper conduct analogous to that which had to be inquired into by the Commission—that something of the kind had taken place in South Australia. That would be a different question altogether, and it might be considered in one sense material to the inquiry. But if Mr. Parkes now distinctly said that he made no suggestion of that kind at all, and that the whole matter of Mr. Hickson's connection with South Australia, as far as he could see, resolved itself into an inquiry whether Mr. Hickson did or did not make some mistake in engineering, then the question bore a very different aspect.

Mr. Parkes said that, as far as he could ascertain from the papers, the matters which had occurred in South Australia afforded a parallel to the matters connected with this inquiry. He did not know whether His Honor wished these matters to be gone into in that relation.

His Honor said he had no wish to go into them at all, and he thought it a great pity that they should be gone into.

Mr. Parkes said he was anxious to avoid it, because he could not afford the time and expense incidental to any material prolongation of the inquiry.

His Honor reminded Mr. Parkes that he had introduced the matters now referred to in the course of his evidence.

Mr.

Mr. Parkes said he had briefly referred to the matter to show how it was that he had first come to question the estimates and work of Mr. Hickson.

His Honor said that, whatever Mr. Parkes' intention may have been, the matter had been introduced, and Mr. Hickson wished to clear it up. He could only say that, if it were gone into at all, Mr. Smith, in his examination of witnesses, should confine himself as closely as possible to the question, not of Mr. Hickson's ability as an engineer, but of his rectitude as an officer of the South Australian Government. He took it that the question of Mr. Hickson's ability as an engineer was utterly outside the question into which the Commission had to inquire.

Mr. Parkes said that if Mr. Smith were permitted to take the course now suggested it would involve the production of a great many documents, and the calling of a great number of witnesses.

His Honor said it would depend upon what might transpire in the course of the evidence tendered, whether it would be necessary to call further evidence. As to opinions of Ministers of the Crown in South Australia, or any other persons, he certainly would not go into those matters at all. They would have to be altogether eliminated from the inquiry.

Mr. Parkes said it would be necessary that all the papers in connection with the arbitration case, in which Wells Brothers were concerned, as well as the report of the South Australian Commission upon Public Works, should be put in.

His Honor said that he could not refuse to allow Mr. Hickson to adduce evidence as to what had taken place in South Australia, considering that evidence had already been given, remotely but distinctly bearing upon that very question.

Mr. Smith said that the evidence was the more necessary in that Mr. Parkes now admitted that it had been given with the object of making a suggestion of improper conduct on the part of Mr. Hickson.

His Honor said that there could be no doubt that the question had first arisen in Mr. Parkes' statement prior to his cross-examination.

Mr. Parkes said he understood from Mr. Smith's method of cross-examination that he wished to go into the motives which had actuated him in making the statements which he had made.

His Honor said that if Mr. Hickson intended to go into the question he would allow him to do so. At the same time, he thought it would be a pity to introduce the subject, because it involved the opening of a great deal of evidence, possibly leading to a great deal more trouble and expense. The whole thing appeared to him to be very slightly, if at all, material. The great difficulty arose from the inquiry being of a public nature. Had it not been of a public nature it would have been open to them to say that the matters referred to were known entirely to those immediately concerned in the Commission, and that they would not go any further into the matter; but, the facts referred to having gone forth to the public, the matter stood in an entirely different position, and he considered that Mr. Hickson had a right to vindicate himself in the eyes of the public.

Mr. Smith understood that Mr. Parkes did not withdraw the suggestion that the matters that had transpired in South Australia raised the question of Mr. Hickson's integrity.

Mr. Parkes said that no doubt the matters which had happened in South Australia afforded a parallel to the matters involved in this inquiry.

Mr. Smith said that in the face of that declaration he thought it would be impossible to eliminate the matters referred to. It would be necessary to go into them.

His Honor said that, with regard to Rudolph, if it were the fact, as reported, that, in consequence of a partially-heard charge against him—because that was all that it could be called until the report of the Commission had been presented—certain action had been taken in relation to his salary, then he considered that a very great wrong, a very serious wrong, had been done, which afforded another reason for regret that the plan which he had originally intended to adopt of not making public the evidence given in the course of the inquiry until the inquiry itself was complete had not been adhered to. It might appear, for instance, that Rudolph had suffered because of something which had been elicited in the course of the inquiry but which might finally turn out not to throw the slightest suspicion of discredit upon him, or upon anyone else. If the action indicated had taken place he thought that Rudolph had been treated in a very improper way. Of course, if at the termination of the inquiry his report should be to the effect that Rudolph had done wrong—if that should come out, directly or indirectly—he might legitimately be called upon to show cause why he should not be even dismissed; but while the question was *sub judice* he did not think that any authority had any right to deal with him upon any inchoate question of fact which was not determined.

Mr. Smith said there had been a misunderstanding in the matter. When the evidence first came out with regard to the loan of money by Mr. Carter to Rudolph, the intention was to remove Rudolph from outdoor work to indoor work at a lower salary. It was then pointed out that that would be forestalling His Honor's report, and that that should be waited for. Through some mistake the lower salary had been placed upon the Estimates, as though Rudolph had been retained at his old work at that salary. That was the explanation of what had occurred.

Mr. Davis said that the placing of the reduced salary upon the Estimates was quite the result of accident, and was not intentional.

His Honor, at 1-20 p.m., adjourned the inquiry until 10 a.m. on Wednesday, 16th September.

C. E. R. MURRAY,  
Commissioner.

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WEDNESDAY, 16 SEPTEMBER, 1896.

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising), Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising), Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Robert Rowan Purdon Hickson was recalled and further examined.

William Julius Baltzer was sworn and examined.

His Honor, at 1 p.m., adjourned the inquiry until 10 a.m. on Friday, 18th September.

C. E. R. MURRAY,  
Commissioner.

FRIDAY,

## FRIDAY, 18 SEPTEMBER, 1896.

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor) advising, attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Mr. Gummow said, with reference to Contract 79A, the contract on which some of the brickwork had been disturbed in the course of the inspection made by direction of the Commission, he would like to know whether the contractors were at liberty to make the work good. The period of maintenance in respect of the contract had expired, and in the meantime the contractors were being kept out of their money and deposit. He would also like to know whether, in respect of Contract 118, His Honor proposed to order an inspection which would in any way disturb the work, the period of maintenance having expired in that case also.

His Honor said that, as far as the Commission was concerned, there was no objection to the work upon Contract 79A being made good at once. He did not suppose that Mr. Parkes would raise any objection.

Mr. Parkes stated that he had no objection to that course.

His Honor said that in that case the matter was entirely one between the department and the contractors. As regarded Contract 118, no application had been made, and he saw no need for an inspection.

Mr. Gummow desired to know whether His Honor would like to see any water impounded in the carrier on Contract 77.

His Honor said that it might be satisfactory, if it were not a difficult thing to do, to block up the ends of a portion of the carrier and make a trough of it for the time being. If the water were impounded for some days, it would be, to some extent, a satisfactory test.

Mr. Gummow said a portion of the carrier was already blocked, and he would direct it to be filled with water to the level of the blocking.

George Christie, William Julius Baltzer, George Forrest, Frank Moorhouse Gummow, and Joseph Davis were recalled and further examined.

James Gillan and Charles O'Hanlon were sworn and examined.

His Honor at 12:55 p.m. adjourned the inquiry until 10 a.m., on Monday, 21st September.

C. E. R. MURRAY,  
Commissioner.

## MONDAY, 21 SEPTEMBER, 1896.

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

James Flood, Nicholas Ryan, Alexander M'Millan, Peter Hart, Charles King, and Sydney Booth were sworn and examined.

John Carter was recalled and further examined.

His Honor, at 12:52 p.m., adjourned the inquiry until 10 a.m., on Wednesday, 23rd September.

C. E. R. MURRAY,  
Commissioner.

## WEDNESDAY, 23 SEPTEMBER, 1896.

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); and Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Joseph Davis, John Carter, and William Henry Warren were recalled and further examined.

Thomas Edward Spencer, William Greenwood, and Andrew Eaton were sworn and examined.

His Honor said he understood that Mr. Parkes had made inquiry of the Secretary to the Commission as to whether addresses would be heard upon the conclusion of the evidence; and he desired now to intimate that when that stage of the inquiry was reached he would hear addresses, first, from a representative of the department, secondly, from a representative of the firm of Carter, Gummow, & Co., and finally, from Mr. Parkes himself. He would also direct that the addresses be recorded on the minutes.

Mr. Parkes said that if that course were allowed it was not his present intention to call any further evidence. His intention was, in the address he proposed to deliver, to connect the evidence which he had so far tendered to the Commission.

His Honor said that an address and the tendering of evidence were essentially different, and, if Mr. Parkes wished to make any statement as to facts, it should be as a witness, as distinct from the position he would occupy in addressing the Commission.

Mr. Parkes said there were certain inconsistencies and other matters in the evidence which he had left untouched, and if he were not allowed to address His Honor upon those points it would be necessary for him to tender evidence in regard to them.

His Honor said it would be more appropriate for Mr. Parkes to take the course he indicated in the form of an address by way of argument; but if there were any facts which he desired to produce they would come in as evidence in reply. Assuming that the evidence were altogether closed on Friday, he would be prepared to hear the department either through Mr. Smith or through Mr. Hickson himself, whichever might be thought desirable, on Monday. If the department desired a longer adjournment than the usual adjournment from Friday to Monday, in which to prepare an address, he would consider an application on Friday.

Mr.

Mr. Davis said he understood that His Honor would call upon the department to address him first. His Honor said that that was so. Of course, if arrangements were made for a different order of addresses, well and good; but the order he had indicated would be the proper order according to the practice of the courts of New South Wales.

Mr. Norrie said that the department would make an application on Friday for a postponement if it were considered necessary; but he did not, at present, anticipate that a longer adjournment would be required.

His Honor, at 1:25 p.m., adjourned the inquiry until 10 a.m., on Friday, 25th September.

C. E. R. MURRAY,  
Commissioner.

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FRIDAY, 25 SEPTEMBER, 1896.

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Joseph Davis, John Carter, and Frank Moorhouse Gummow, were recalled, and further examined. Charles James Henty and Henry Johnston were sworn and examined.

Mr. Smith said he had been given to understand that Mr. Parkes desired to address the Commission, and that His Honor had intimated that he would be prepared to hear him, at the same time announcing that the same privilege would be accorded to the department, and to Carter, Gummow, & Co. As to the department's addressing His Honor through a representative, having considered the matter with Mr. Hickson, it seemed to him from his point of view to be quite unnecessary for him to make any remarks, but he would like to ask His Honor whether there was any matter in the evidence to which any argument might be addressed, which His Honor would like to hear.

His Honor said he hardly liked to bind himself to any such statement at present, but he desired to go through the whole of the evidence very carefully. It would be necessary for him to do that before he began his report; but there was no special matter in respect of which he would now bind himself down to the extent of asking for an explanation. It might have the effect of putting the Commission and also the Department in a false position.

Mr. Smith said he thought there might have been some point which had struck His Honor as requiring explanation. Looking at the whole matter from a general point of view, he was quite prepared to leave it as it stood without saying one word in argument or by way of address. He thought that would be the conclusion to which the Department would finally arrive.

His Honor said he would leave it to Mr. Smith to consider between this and the following Wednesday, what course he would take.

Mr. Andrews said he quite agreed with the observations of Mr. Smith. He did not think that anything which might be said on behalf of the contractors would in any way assist His Honor. At the same time the contractors would be very glad to know whether there was any point upon which His Honor would like them to tender further evidence.

His Honor said that if any point struck him he would not hesitate to ask for further evidence if it were necessary.

His Honor, at 1:5 p.m., adjourned the inquiry until 10 a.m., on Monday, 28th September.

C. E. R. MURRAY,  
Commissioner.

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MONDAY, 28 SEPTEMBER, 1896.

His Honor the Commissioner sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Frank Moorhouse Gummow and John Carter were recalled and further examined.

Mr. Andrews intimated that the evidence of Mr. Gummow would close the evidence which the contractors intended to call.

His Honor said he understood that no attempt had been made in the direction of securing the attendance of Mr. Snodgrass.

Mr. Andrews said that no such attempt had been made; but if His Honor thought it necessary to have Mr. Snodgrass called he would of course be subpoenaed. It would however be an expensive matter to bring him up from New Zealand, where he was carrying on a powder manufactory on the Thames goldfield.

Mr. Carter said that Mr. Snodgrass was himself in charge of the works, which were in connection with an outside speculation or patent, over which Mr. Snodgrass and the firm had dissolved partnership. Mr. Snodgrass had taken the New Zealand rights and had started for himself.

His Honor said he would like to know whether there was any further evidence which the department wished to call.

Mr. Smith said the department desired to call no further evidence.

His Honor said he would also ask Mr. Parkes whether he desired to call any further evidence in reply.

Mr. Parkes said he did not.

His Honor thought he would be hardly justified in bringing Mr. Snodgrass from New Zealand at great expense. He supposed he would speak as to facts which would probably be within the knowledge of other persons who had given evidence. He would ask Mr. Smith, as representing the Department, whether any decision had been arrived at by him as to whether he would address the Commission.

Mr. Smith said that on further consideration it seemed to him—and he thought Mr. Andrews would agree with him—that, inasmuch as Mr. Parkes had determined, with his Honor's leave, to address the Commission, it was only right to the Department and to Mr. Hickson that something should be said on their behalf, upon the evidence. He intended, with his Honor's permission, to briefly address the Commission on Wednesday. He thought that on the whole that was the right conclusion to come to, although the Department would have been perfectly content to leave the evidence entirely in his Honor's hands. However, as there would be an address upon one side, he thought there ought to be addresses on all sides.

Mr. Andrews said that either he or Mr. Gummow would be prepared to address the Commission at the conclusion of Mr. Smith's address.

His Honor said he would not bind himself not to call for any more evidence at any stage, but he did not at present see any reason for doing so. He intended to read through the proceedings, and had already partly done so, of the Public Works Committee in connection with the Pymont Bridge scheme. Mr. Hickson, it appeared, was examined before that body. He mentioned these proceedings, because he thought they were remotely and indirectly mixed up with the inquiry. He did not think, however, that it would be necessary to put in the proceedings as evidence. They might be alluded to in his report or they might not. Beyond that he did not see the necessity at present of calling for any further evidence. He wished it to be understood, however, that, even after the addresses had been concluded, if he thought fit to do so, he might call witnesses.

His Honor, at 12:55 p.m., adjourned the inquiry until 10 a.m., on Wednesday, 30th September.

C. E. R. MURRAY,  
Commissioner.

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WEDNESDAY, 30 SEPTEMBER, 1896.

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising), Mr. Ernest Smith (appearing for Mr. Hickson), Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

Robert Rowan Purdon Hickson was recalled and further examined.

His Honor said there was one matter of which he would ask the Press to take note, and it was this—that the Commission could take evidence at any time, even after the addresses were concluded; and, if there were any persons who could in any way give the Commission information of any kind which was at all material to the question which had to be inquired into, he would request them to come forward. There was one question which had become material—curiously material—and which might not have been supposed originally to be material, and that was the question of whether or not Mr. Carter was, in fact, a man of remarkable liberality and generosity. It was a question which he thought very important, and especially in one particular relation, to inquire into; so that if anyone would come forward and would speak to that fact on either one side or the other he should be happy to hear that evidence, it being, of course, absolutely independent testimony. If any one who knew what Mr. Carter's character was in that relation would come forward and say what he knew, whether it were in favour of the suggestion that Mr. Carter was a very liberal man or to the opposite effect, he would be very much obliged to that person. It was an invidious thing for persons to give evidence in any respect derogatory to the character of another; but if any one wished to give such evidence with respect to Mr. Carter's character, believing that he was doing his duty in so doing—if anyone could show that evidence which had been given in favour of the suggestion he had referred to was mistaken or untrue—then, if that person wished to give that evidence, and not to have his name published, he would give the necessary instructions; although, of course, any person giving such evidence would be subject to cross-examination. He would undertake, however, that the names of the witnesses would not, if it were so desired, be published. He considered this matter to be such a very important one, especially in one particular relation, that he made this suggestion for the public generally to act upon.

Mr. Andrews said that he himself, as it happened, was in a position to give evidence in reference to Mr. Carter's well-known generosity; but he presumed that His Honor would prefer to examine some absolutely independent witnesses.

His Honor said that he would of course prefer independent witnesses.

Mr. Andrews desired to know whether His Honor would accept him as a witness.

His Honor said that Mr. Andrews was not interested except in so far as he was solicitor to one of the parties, and if he, speaking from his own personal knowledge, or of what might have been his experience, chose to give evidence of the nature suggested, he should be very happy to hear him. The fact that Mr. Andrews occupied the position of solicitor to one of the parties would not preclude him from giving the evidence, nor would it, to his mind, affect Mr. Andrews' credibility.

Mr. Andrews said he took it that His Honor would prefer other evidence if it could be obtained.

His Honor said he did not say that he would prefer it; but it would perhaps look better, so far as the public generally were concerned. He would now call upon Mr. Smith to address him on behalf of the Department.

*Mr. Ernest Smith:* May it please your Honor,—I had hoped, as I said the other day, to be relieved of the task which now lies before me, and that your Honor, also, would be relieved of the necessity of having to listen to me; but inasmuch as Mr. Parkes has expressed a desire to address the Commission, I think that, in justice to the Department and to Mr. Hickson, as the head of the Department, it is perhaps right that I, who represent the Department here, should place our view of the evidence before your Honor. In doing so I intend to be as brief as I can; but, as your Honor is aware, I have a great mass of evidence

to



to deal with, and there are a great number of charges. My best course, I think, will be to deal with the charges *seriatim*, referring to the evidence which has been tendered in support of them. First of all, I should like to draw your Honor's attention to the object of this inquiry. The Commission which has been issued to your Honor is—

To make a diligent and full inquiry touching all questions which have been in any way raised in our Legislative Assembly of our said Colony of New South Wales, whether specifically or in course of debate, as to any improper conduct in connection with the contracts, past and present, of Messrs. Carter, Gummow, & Co., John Carter, D. G. Snodgrass, George Maddison, Peter Ewing, F. M. Gummow, George Forrest, and James Gillan, with the Department of Public Works; and touching the truth of any charges which have been so as aforesaid made in connection with the performance or variation, if any, of such contracts, or the conduct of any public officer or of the said contractors, their agents or workmen, in relation thereto.

The charges which are here referred to, I take it, are comprised in speeches made in the Legislative Assembly on two occasions, the first occasion being the 26th of September, 1895, and the second occasion the 12th May, 1896. On the first occasion Mr. Parkes made two speeches, and speeches were also made by other Members of the House by way of comment upon Mr. Parkes' speech. On the second occasion, viz., the 12th May, there was only one speech delivered by Mr. Parkes, and upon that, I believe, this Commission was issued. Before I refer to the charges *seriatim* which have been by your Honor directed to be tabled, as it were—Mr. Parkes being required to put in at the opening of the Commission the particulars of the charges which he made in his speeches—before I refer to those there is one matter to which I will direct your Honor's attention. I should mention that although these charges have been tabled, as it were, your Honor has stated that Mr. Parkes was to be in nowise tied down or limited to these formulated charges—that he was to have the fullest liberty to add to them, to amend them, or to substitute others. That liberty Mr. Parkes has exercised to the fullest extent. Charges have been withdrawn; others have been substituted; charges have been added and afterwards withdrawn; charges have also been amended, until at last we have here a list of charges which I suppose I must take, for the present, to be final. At this stage it will perhaps be well for me to direct attention to what seems to me to be the gravamen, the substantial ground of complaint of all these charges, and I prefer to give it in Mr. Parkes' own words. In his speech in the Legislative Assembly, under date of September 26th, the speech being reported in volume LXXX of *Hansard*, page 1198, Mr. Parkes says:—

There is a set of contractors whose names or titles are Messrs. Carter, Gummow, & Co. They contract for various works in this country—at present most of them are about Sydney. This firm of contractors are identified with the Government in the most suspicious fashion.

Mr. Parkes then goes on, as I take it, to explain the way in which this firm of contractors are identified with the Government. Of course, when Mr. Parkes uses the expression “the Government,” I take it that he does not intend to refer—and he so stated in his evidence—to the Ministerial heads of any department, or to any member of the Government; in fact, in his second speech he told the House distinctly that he did not charge the Honorable Member who happened to fill the office of Secretary for Public Works with corruption. He said that that gentleman might be stupid or ignorant, or that he might have allowed his officers to catch him—I think that was the expression used—but that what he specially referred to, in using the expression, “the Government,” was the responsible officers of the Works Department. Who these responsible officers are he has not told us. That is left at large. But, at all events, from reading Mr. Parkes' speech, it is evident at which officer in particular his charges were aimed. He goes on to explain how it is that this firm of contractors is identified with the Government in a suspicious manner. He says, for instance, that he has it on the most reliable authority that young Mr. Hickson was a partner in the firm. He says:—

Having established this connection between the Engineer-in-Chief's son and the firm, I intend presently to show what concessions were given to these contractors.

He proceeds to deal with those undue concessions which form the subject-matter of the charge-sheet which he has formulated. I think your Honor will agree with me in my contention that the sum and substance of these charges is the allegation that young Mr. Hickson was a partner in the firm, and that by reason of that more than suspicious identification these undue concessions had been made. It is true that the charge of young Mr. Hickson's being a partner in the firm has now been withdrawn; but still, as your Honor has to inquire into the truth of the charges, not as formulated here, but as made in the House, I should like to draw your attention to the way in which the charges are made, and to the evidence, or so-called evidence, upon which they are founded. In the first place, it will be remembered that it was admitted by Mr. Parkes in his evidence that, previous to his speech of 26th September, 1895, he had asked questions in the House. He admits that he asked the Secretary for Public Works questions as to the connection

connection of young Mr. Hickson with this firm of contractors. The questions were put to the Minister by Mr. McCourt in Mr. Parkes' absence, although, as a matter of fact, they were Mr. Parkes' questions, and were indeed referred to by him in his speech. The questions consist of several paragraphs. Paragraph 7 is as follows:—

What connection has a Mr. Hickson with this firm or with the works?

The answer to that is—

He is engineer to the contractors.

The 8th paragraph is as follows:—

Is this Mr. Hickson a son of the present Engineer-in-Chief?

The answer to that is as follows:—

He is the son of the Engineer-in-Chief for Public Works; but the Balmain contract referred to is being carried out under the supervision of the President of the Water and Sewerage Board, and Engineer-in-Chief for Sewerage Construction, Mr. Darley. In the case of the other contract referred to, namely, the Sewerage Works at North Sydney, which was carried out under the supervision of the Engineer for Public Works, I am informed that Mr. Hickson, junior, had no connection with the work, being at that time in South Australia.

Those questions were answered in the Legislative Assembly, on 18th September, just one week before Mr. Parkes made his first speech on the question. Your Honor will, therefore, see that at the earliest stage clear and definite information was conveyed to Mr. Parkes as to the real connection between young Mr. Hickson and the present permanent head of the Works Department. He was stated to be, as he was in fact, engineer to the contractors. During the time the contracts referred to by Mr. Parkes were in hand, young Mr. Hickson was engaged by this firm of contractors as their engineer, in another colony, and had nothing whatever to do with those works. I think that has come out beyond the shadow of a doubt; in fact it is virtually admitted by the withdrawal of the charge, and the information thus afforded to Mr. Parkes was true in every particular. However, Mr. Parkes, for some reason or other, declined to accept these positive statements, made by the Minister from his place in the House. He said that he had it on the most reliable authority, that young Mr. Hickson was a partner in the firm. He further stated that he had been informed that there was in existence a telegram, sent from this Colony to Adelaide, by one member of the firm to another, to the effect that young Mr. Hickson must be taken into partnership at any price. He further stated that his informant, Mr. Maddison, had been a member of the firm; but that he had left it: and that he had undertaken to get a copy of that telegram. When he was asked by Mr. Garrard, by way of interjection, whether he had the telegram, Mr. Parkes said he was assured by the partner to whom he had referred that he could produce a copy of it. He went on to say:—

If it is not forthcoming a copy can be obtained from the Telegraph Department.

Your Honor will therefore see that we have a very distinct statement as to two things—first of all, that Mr. Parkes has it on reliable authority or evidence that young Mr. Hickson was a partner, and secondly that that same reliable authority had undertaken to produce a copy of the telegram to the effect stated. Your Honor will perhaps remember that, when Mr. Parkes' attention was drawn to this matter in cross-examination, his answer went rather to show that he was now unfortunate enough to find out that he could not obtain a copy of the telegram from the Telegraph Department, it being the practice of the department to destroy all telegrams after they had been in existence for a certain time. It will be seen, however, that the obtaining of a copy from the Telegraph Department had nothing whatever to do with the first allegation—a distinct and positive allegation—that Mr. Maddison had undertaken to produce a copy. We should not have heard anything at all about obtaining a copy from the Telegraph Department had it not been for the interjection of Mr. Garrard, following the statement by Mr. Parkes that Mr. Maddison had undertaken to get a copy. That was a distinct allegation by itself. Mr. Parkes alleged that he held in his hand complete evidence of the truth of his statement, and, in effect, that the specific and positive information which had been given to him by the Secretary for Public Works a week before was not to be relied upon—in other words, that his evidence was more reliable than that which had been put forward by the Minister. What does Mr. Maddison say? A great deal of the time of the Commission has been taken up by going into the question of what these contractors, who waited upon Mr. Parkes, said. For my own part I do not think the time of the Commission has in that respect been in any wise wasted. I think it is very satisfactory indeed that the thing has been sifted to the bottom, and I submit that we have now got down to the bed-rock so far as that part of the case goes. Mr. Maddison apparently was one of the first of the disappointed contractors, who had their various grievances, who went to Mr. Parkes. Mr. Maddison and Mr. Williams were apparently the two prime movers in the whole of this deputation business. Mr. Williams, I believe, said that he saw Mr. Parkes at least ten or twelve times, and Mr. Maddison states that he saw him on several occasions with others, to whom I need not refer. But what

what does Mr. Maddison, who was represented by Mr. Parkes in the House to be such a reliable authority, now say with regard to Mr. Parkes' statement? First of all he point blank denies that he ever undertook to produce a copy of the telegram, and then he says that he could never have undertaken to do such a thing, inasmuch as he had never seen such a telegram in his life. Further than that, he says that he never stated that young Mr. Hickson was a partner. We have, therefore, from Mr. Maddison himself, the authority upon which this statement was made in the House, an absolute and complete denial of it. I do not think I need waste the time of the Commission by referring to the evidence of the other contractors. Your Honor will see that each of the men had his grievance. Mr. Gilliver, for instance, seemed to think it a hard thing that the contractors were getting contracts let to them without tender. Reference was made to Contract 79A, which was an extension of Contract 79, at North Shore, and Mr. Gilliver thought it a very hard thing, so far as the other contractors were concerned, that Carter & Co. should have had that contract let to them without tender. But what happened in Mr. Gilliver's own case. He admitted that he had had a very large contract indeed in another part of the city, and that he had had an extension quite as big as the original contract granted to him without any tender at all. Here, then, was this man with his grievance, only too glad to get the same concession, if it be a concession, granted to him. Mr. Parkes, however, has now withdrawn his charge, in so far as it relates to young Mr. Hickson's being a partner, but although it is withdrawn I think I ought to show in what way the matter has been dealt with by Mr. Parkes right down to the present day. The next stage is this: We have a small set of papers laid upon the Table of the House in December, 1895. It is already in evidence, and I do not propose to refer to it at any length. I refer to it merely for the purpose of showing that when Mr. Hickson, senr., was given an opportunity, he very explicitly stated what was his son's connection with the firm. He repeats the allegation that he was simply employed by them as an engineer in Adelaide. He also contradicts another statement made by Mr. Parkes, to which I ought to have referred just now, viz., that although young Mr. Hickson was employed in Adelaide he was going to and fro constantly. Mr. Hickson, senr., denies that statement also, and he points out that from April, 1893, till August, 1895, young Mr. Hickson was wholly employed in Adelaide; that it was not a fact that he went to and fro between Sydney and Adelaide, or that he came up here with Mr. Gillan on one occasion, as alleged. He said, on the other hand, that he was here on only one occasion during that interval, when he came up on a holiday at Christmas time. Papers containing this distinct information were laid upon the Table of the House in December; but what notice does Mr. Parkes take of that. One would have thought that he would have made some inquiry of Mr. Maddison, in view of these repeated statements; but he made no inquiry of any kind apparently before he made his second speech on the 12th May, 1896. In spite of these repeated statements made to the House authoritatively on the subject of young Mr. Hickson's connection with the firm, Mr. Parkes made no effort to obtain the telegram from Mr. Maddison, or to confront Mr. Maddison with these statements in any way, before he made the second speech on the 12th May, 1896. When he did make that second speech, how did he deal with Mr. Hickson's remarks? He said that Mr. Hickson's memorandum was untruthful from beginning to end. It is hardly possible to conceive how anyone could have presumed to make such downright, definite, statements as these without using something more than ordinary care and caution to see that the statements were true. But not one step of the kind was taken between the 19th December, when the papers were printed, and the 12th May, when Mr. Parkes made his second speech, and when he had the hardihood to tell the House that Mr. Hickson's memorandum was untruthful from beginning to end. After the second speech we have the Royal Commission, and, as your Honor knows, on the first or second day of the meeting of the Commission, Mr. Parkes tabled certain charges. Among those charges was this one:—

That Robert Hickson, while being an officer of the Crown, viz., Engineer-in-Chief for Public Works, did act collusively with his son, George Hickson, a partner of the firm of Messrs. Carter, Gummow, & Co., by which the said George Hickson obtained wrongly money belonging to the Crown.

That charge remained before the Commission until the 15th June. It was on the 27th May that the original charges were formulated, so that for nearly three weeks that charge stood before the Commission. In the first place it is difficult to conceive how it was that Mr. Parkes brought himself to put forward such a charge, because, although he told us that before his speech of 12th May, 1896—his second speech—he did not interview the contractors again,—we are told that between the 1st May and the date of the sitting of this Commission he did see them; and one would have thought that before laying a charge such as that on the table he would have seen to some extent where he was in relation to it. Apparently when he made that charge he did not exactly know what evidence he was going to bring forward. I confess it is very difficult to understand how such a charge came to have been made. Mr. Parkes told the Commission in his examination that one of the reasons which influenced him in laying that—if I may use a strong expression—monstrous charge was this—that young Mr. Hickson was not in this Colony, that

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he was at work in Western Australia, and that he was very anxious that he should come here. He deliberately tells this Commission that one of his reasons for laying that most serious charge—which has completely broken down—was that he might compel Mr. Hickson, senr., to get his son to come over. That is Mr. Parkes' own evidence. It seems to me that such conduct as that is simply playing with a serious matter. The idea of this serious indictment being made with an object of that kind. In my humble experience it is absolutely unheard of. Mr. Parkes is in a responsible position—in fact, he has told the Commission that he is appearing here as representing the public, and that a man in a position of that kind should take such an extraordinary course for a such purpose is almost inconceivable. However, the charge was laid, and it remained here, as I say, until the 15th June. Mr. Parkes seemed to insinuate that there was some kind of hanging back on the part of Mr. Hickson, senr., in bringing his son over. I merely mention it because I do not want such a supposition to go uncontradicted in any way. I do not wish it to be supposed for one moment that there was any thought or feeling on the part of Mr. Hickson, senr., in opposition to his son's appearing before the Commission. As Mr. Hickson himself told your Honor, his sole reason for doubting whether his son could come was this—that he was in Western Australia, on the verge of getting what might turn out to be a very good appointment under the Government of that Colony, and that if he were to leave the Colony at that critical time he might miss his appointment. That was the sole reason for any hesitation on Mr. Hickson's part in regard to his son's coming such a long distance at that particular time. Your Honor sees that there could not have been any other reason, so far as young Mr. Hickson is concerned. It was to the advantage of Mr. Hickson, senr., that he should be here. Your Honor has had the advantage, however, of seeing him in the box, and of seeing what style of young man he is. His evidence, together with the other evidence which has been tendered, has cleared up the whole matter so thoroughly that Mr. Parkes' only course was to withdraw the charge. That charge, therefore, is now, we trust, dead. And, as I contended in opening my address to your Honor, it is really the substantial ground of the whole of these charges—it is the gravamen of the charges. It is the main cause of complaint. As Mr. Parkes pointed out to the Legislative Assembly, having established the connection between the two individuals, viz., the head of the Works Department and his son, the engineer for this firm of contractors, he would proceed to consider what concessions the firm obtained by reason of that identification or connection. That charge has absolutely fallen to the ground, and has been abandoned. Therefore, I contend with absolute confidence that, so far as this Commission is concerned, the bottom of all these charges has absolutely fallen out. It is not for a moment to be supposed that if Mr. Parkes had simply alleged or informed the House and the country that there had been a mistake in a schedule, or that a contractor here or there had got an extension of a large contract without tendering, or that there had been an incautious application of a new and comparatively unknown method of construction, or anything of that kind—that if he had merely shown either mistakes or want of judgment, we should ever have heard of a Royal Commission. The main ground of this Commission, as I understand it, lay in a charge, not of incapacity or negligence, but a charge of a corrupt connection between the heads of the department and a firm of contractors. That was the reason why this Royal Commission was issued, and, that charge having fallen through, I contend that the bottom of the whole of these charges has absolutely fallen out. Having got rid of that main charge, I will come now to the next set. On the 15th June we had a new version of this charge. The partnership allegation was abandoned, and the charge was put in this way :—

That Robert Hickson, while an officer of the Crown, viz., Engineer-in-Chief for Public Works, did allow of undue concessions being granted to Messrs. Carter, Gummow, & Co., contractors for sewerage works in the Colony of New South Wales, his son, George Hickson, being an interested party in the firm of Messrs. Carter, Gummow, & Co.

That is the charge as it was formulated on 15th June. It remained in the charge-list until the 4th instant. Your Honor will remember that as soon as that charge was formulated I applied that Mr. Parkes should give us the particulars of the undue concessions referred to. Your Honor directed that those particulars should be furnished, and in pursuance of that direction Mr. Parkes supplied them in a letter dated 15th June, addressed to Mr. Hickson, as follows :—

R. Hickson, Esq.,—  
Dear Sir,

121 Pitt-street, Sydney, 15 June, 1896.

The concessions referred to in my charge substituted this morning are contained in Nos. 1, 2, 3, 4, and 7, of charges on Contract 69, and Nos. 1, 2, on Contract 72, and Nos. 1, 2, and 3, of Contract 77, and Nos. 1, 2, 3, 4, 5, 7, 8, and 10, of Contract 79, and in Nos. 1, 2, 4, of Contract 79A, and in Nos. 1, 2, of Contract 118.

Yours, &c.,

VARNEY PARKES.

It will be seen that the contracts affected are 69, 72, 77, 79, 79A, and 118. I may mention that the total number of charges in the charge-sheet at that date was something over thirty, and, as to those thirty odd charges, Mr. Parkes furnished particulars directly connecting young Mr. Hickson with twenty-three of them.

them. Twenty-three undue concessions are alleged to have been given to Carter, Gummow, & Co. Why? Because young Mr. Hickson was an interested party in the firm of Carter, Gummow, & Co. That was Mr. Parkes' allegation as it stood before this Commission from the 15th June until the 4th instant. In order that there should not be any doubt as to the real meaning of the charge, I asked Mr. Parkes whether it was his serious intention to allege that these concessions were granted to the firm of contractors because young Mr. Hickson was an interested party in the firm. Your Honor will see that from the way in which the charge is framed, it might have amounted only to an allegation that certain concessions were made, and that it was a curious coincidence that young Mr. Hickson was at that time an interested party in the firm. But in order that there might be no doubt upon the point, I asked Mr. Parkes whether the one thing depended upon the other, and his answer was that these concessions were made, in his opinion, because young Mr. Hickson was an interested party. There were twenty-three of those concessions at that time. We come down now to the 4th of September. On that date, by your Honor's leave, Mr. Parkes gave us an altogether new and revised version of his charges. First of all, in his revised version some half a dozen charges are withdrawn. Then four or five are altered, and we have two new charges, to which I will refer presently. With regard to the charge affecting young Mr. Hickson, the way in which it stands in the new list is this:

That Robert R. P. Hickson, while an officer of the Crown, viz., Engineer-in-Chief for Public Works, did allow of undue concessions being granted to Messrs. Carter, Gummow, & Co., contractors, for sewerage works in the Colony of New South Wales, his son George Hickson being an interested party in the firm of Messrs. Carter, Gummow, & Co.

That is substantially as it was before; but instead of there being twenty-three undue concessions, we are now limited to three. Two of these form part of the twenty-three concessions comprised in the former charges, and one is an entirely new matter. It will be seen, therefore, that between the 15th of June and the 4th September we had sufficient evidence before this Commission to satisfy even Mr. Parkes that, instead of twenty-three undue concessions being granted because of young Mr. Hickson's connection with the firm, only two were granted, twenty-one of them having to be absolutely abandoned by him. Mr. Parkes thinks also that he can establish another one—an entirely new undue concession, and that has been added. That brings me down to the list of charges as it stands, and I propose, with your Honor's permission, to deal with those charges as they appear seriatim. I intend to be as brief as I can. In the first place, I will take the charge relating to young Mr. Hickson. That charge rests upon this allegation—viz., that these concessions were made because young Mr. Hickson was an interested party. First of all let me direct your Honor's attention to the nature of the interest which is alleged to be the cause of these concessions. Perhaps I had better take, in the first instance, the evidence of Mr. Hickson, senr. He came here and he told your Honor, in his own words, without question or leading from me, how it was that young Mr. Hickson was brought up to follow his father's profession, and how he came to abandon that profession here. His leaving the Department amounted to abandoning it here, because, as your Honor knows, there is very little engineering work in the Colony outside of the Government work, the Government of the Colony carrying out most of the engineering work. Mr. Hickson, senr., had intended that his son should follow in his footsteps, as it were, but that idea had to be abandoned. Why was that? Mr. Hickson tells us that in 1893 he was charged with the duty of reorganising the branch of the Department of which he was the head. It was a vast undertaking, and Mr. Hickson found that in the exercise of his duty he had to retrench a certain number of officers. He saw no reason whatever for retrenching his son. He was a capable young man, and he had had a good start, having served under Mr. Moriarty, and also under Mr. Darley. He had had a good training, and his father saw no reason for retrenching him. His son, therefore, remained upon the list of officers retained, and it appears that something was consequently said to Mr. Barling, who was at that time Under Secretary for Public Works. A remark was made to him to the effect that it was a very strange thing that, while so many officers were being retrenched, Mr. Hickson's son should remain in the Department. It was one of those malignant pieces of gossip which so often do so much harm, if they are listened to. Unfortunately, this remark was conveyed to Mr. Hickson, senr., and unfortunately, to my mind, he listened to it. I submit that it would have been much better if Mr. Hickson had shut his ears absolutely to frivolous talk of that kind. He was strong in his position. Everyone knew his character, and a remark of that kind might have been allowed to pass for what it was worth, which was absolutely nothing. However, Mr. Hickson seems to have taken a very different view of it. He went home, slept on the matter, and returned to the office the next morning with a minute written to the effect that his son should be retrenched. That minute, as Mr. Hickson told us, was registered, so that there might be no possibility of his drawing back and altering his mind. Mr. Hickson then had to bring the matter before the Minister, Mr. Lyne. The Minister apparently remonstrated with him, and told him that if he had had any doubt at all he would not allow the thing to go any further, and would permit the minute to be withdrawn. Mr. Hickson remained firm, and the consequence was that young

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Mr. Hickson was retrenched. His father then sent for him and told him he had been retrenched. Mr. Hickson, junior, told his father that that did not matter very much; that he was young; and that he could take care of himself. At all events, the next thing we hear is that young Mr. Hickson, entirely on his own motion and without any assistance from his father—without any suggestion from his father—sees Mr. Carter, a member of this firm of contractors. The firm has a large contract in hand in South Australia, and they want an engineer there to lay out the levels of the tunnels and to do the alignments. An engagement is accordingly made between Mr. Carter and young Mr. Hickson, and, as your Honor sees, it is made without a single suggestion from and entirely without the knowledge of Mr. Hickson, senior. The first that Mr. Hickson, senior, hears or knows of it, is when he is told that the arrangement has been made, and that his son is starting for Adelaide at once. Mr. Hickson has told us that he had no conversation whatever with Mr. Carter or with any member of the firm before this engagement was made, and then he told us of the conversation he did have afterwards. I think he had one slight conversation on the morning of the day when the engagement was made. The effect of it was simply this—that when Mr. Carter began to talk about the firm's having engaged his son, Mr. Hickson, senior, at once said that he did not want to hear anything about it; that his son, being in the employ of the firm, all that the firm had to do was to give him what he was worth and nothing more. There was some further conversation some months afterwards which is not very material, if it be material at all. It will be seen, therefore, that Mr. Hickson, senior, had nothing whatever to do with his son's engagement by the firm. I may say that the evidence of Mr. Hickson upon this point is confirmed by that of Mr. Hickson, junior. Young Mr. Hickson told us, without any leading at all, that he applied for this post himself, and that he did not do so at his father's request. He said distinctly that it was an independent action of his own when he was cut adrift. What was the nature of the agreement? He was to look after a large job in Adelaide, and he was to get £200 a year. I think the amount was afterwards increased to £250 a year. He declares positively that beyond that salary and beyond a certain small sum which was specified—a certain allowance—he had no interest whatever in this firm, and that he had no interest whatever in this Monier patent, of which we have heard so much. The only interest he had in the firm was that he had to earn his salary of £200, or, in later times, £250. I think you will find that this salary was well earned. We had the evidence of Mr. Gummow, who superintended the work of young Mr. Hickson, on this point. Young Mr. Hickson himself told us the nature of the work he had to do. It was evidently pretty hard work, and he sometimes had to work during the whole of Sunday. Mr. Gummow confirmed what young Mr. Hickson said, and he added that he was thoroughly satisfied with the young man and with the manner in which he did this work. Mr. Gummow himself said that the work at times was very hard, and that he thought the salary which was paid to young Mr. Hickson was well-earned. That being so, it is clear that the only interest young Mr. Hickson had in the firm was that of a paid servant at the rate of £200 or £250 a year. Out of that amount he had to keep himself. Afterwards, when the contract in Adelaide was finished, he came out here and work was found for him on certain of the firm's contracts in Sydney. He was not employed by the firm here very long. He began work in August, 1895, and on the completion of the contract upon which he was engaged Carter & Co., being unable to find any more work for him, gave him three months' notice. He was paid up to April, 1896, when he left the firm's employment and had once more to strike out for himself. He went off to Western Australia, where, as your Honor has been told, he had the hope of obtaining an appointment under the Government. That is the history of young Mr. Hickson's connection with the firm, and it is the extent of his interest in it. It is because of that interest of young Mr. Hickson in the firm that we are now told that certain undue concessions have been made to the firm by the Department. These concessions, it is said, were made because the firm happen to have employed in another colony a young man, who was the son of the Engineer-in-Chief for Public Works in this colony. Because the firm were employing this young man, and were giving him a salary which was hardly adequate to the responsibilities and nature of the work he had to undertake, these concessions are alleged to have been made. I will now deal with the three concessions contained in the new list of charges. The first of them is as follows:—

By permitting Messrs. Carter, Gummow, & Co. to obtain the monopoly of the Monier system in Government works, by inducing the Minister to enter into an agreement to adopt their patent in public works, and to pay 15 per cent. royalty for use of same, by an improper minute, inaccurately stating the cost of a special test made in connection with the same.

I confess I am absolutely unable to understand that charge. I have read it several times and I confess I do not understand it—that is, upon the evidence. First of all, we are charged with permitting this firm of contractors to obtain a monopoly in Government works. I confess I do not see how the Department of Public Works can allow a firm to obtain a monopoly. The evidence is that two of these contractors had, with Mr. Baltzer, a patent. By that means no doubt they obtained the monopoly to which every patentee has a right—that is to say, they have the exclusive right to use the subject of the patent. I cannot

cannot see how the Department can have permitted Messrs. Carter, Gummow, & Co. to obtain a monopoly. This patent stands in the name of three persons to whom I have referred, and the charge goes on to state the way in which the alleged monopoly has been obtained—that is, by “inducing the Minister to enter into an agreement to adopt the patent in public works, and to pay 15 per cent. royalty for the use of the same by improper minutes.” In the first place, Mr. Parkes had in the charge the word “minute,” but he afterwards substituted “minutes.” I do not know what these “minutes” can be, unless it be the minute referred to by Mr. Hickson in his evidence on page 563, question 17073. The matter was also referred to by Mr. Barling in his evidence, question 7436. Your Honor will see that this minute was the outcome of a letter written by the contractors to Mr. W. A. Smith, he being the engineer in charge of one of the works. It appears that Mr. Smith, who had taken a great interest in this Monier system, had had—that is evidently the case—a conversation with these contractors as to the terms upon which, if the Government should see fit to use the patent upon any of their works, the patentees would be willing to allow it to be used. This conversation having evidently taken place the contractors wrote in this way:—

Referring to our conversation *re* the use of our patent system of bridge and culvert building, we hereby inform you that the royalty we require for the use of the same by your Department will be 15 per cent. on the cost of construction.

That letter is sent by Mr. Smith to his Chief, Mr. Hickson, and on that Mr. Hickson wrote his minute of the 18th July, to this effect:—

The Monier system of concrete arching has been patented in the Colony by Messrs. Carter & Co. Where applicable, it reduces the cost of spanning an opening by about 50 per cent. The patentees are willing to allow the Department to use the patent on payment of a royalty of 15 per cent. on the cost of the arch. I recommend it for the Minister's approval. I might state that I have just completed, with the permission of the patentees, a culvert on the Parramatta Road, built on this principle, with most satisfactory results, financially and otherwise.

Your Honor will see, first of all, if words in the English language have any meaning at all, that there is in that minute no inducing of the Minister to enter into any contract to adopt the patent. All that this minute asks for is the Minister's approval to this—that if it should be used in any case by the Government, this firm of contractors should be tied down to the charge of a certain royalty only. It was left perfectly open to the Government to use this patent upon any of their works or not; and, moreover, as Mr. Hickson points out in his evidence, it does not apply to the case of any contract made by the Government with other contractors, supposing contracts to be made in which the Monier patent might be used. It would be entirely for the contractors who were the successful tenderers to arrange with the patentees for the use of their patent; and as to the amount of royalty which should be charged, I presume that they would take that into consideration when making up their tender, and in estimating the cost of the work. There is no agreement on the part of the Government to adopt the patent. It would apply entirely and strictly to cases in which the Government by day labour carried out works of their own in which the patent might be used. Mr. Hickson simply asked the approval of the Minister to use the patent in such a case as that upon the payment of 15 per cent. royalty. Your Honor knows, as a matter of fact, that this patent has not been used at all in pursuance of this authority. It has been used by the contractors upon Contract 77, and also upon one small work on the Parramatta Road—a culvert at Strathfield. As I understand the evidence, the use of the patent reduces the cost of spanning an opening by about 50 per cent. I take that to refer to the cost of spanning a road. We have had a good deal of evidence as to the cost and the possibilities of this Monier system; we have been informed that it has been successfully carried out to a considerable extent in Europe, and upon the basis of what has been done there it is estimated that it will reduce the cost of spanning an opening by about one half. We have not at present got to anything like that reduced cost, because the work in the case of the aqueducts to which it has been applied has been made heavier in view of the fact that the patent had not hitherto been tried in the Colony in any work of the kind. Mr. Hickson says in his minute, “With the permission of the patentees, I might state I have just completed a culvert on the Parramatta Road, built on this principle, with most satisfactory results, financially and otherwise.” It will be in your Honor's recollection that a great deal of time was taken up in going into the question of the Strathfield culvert. It was a thing which was rather outside the scope of the inquiry at first, but it became necessary to go into it because of its connection with Mr. Hickson's minute and the allegation that was made that that minute was incorrect and misleading. What is the evidence with regard to this culvert at Strathfield? It was carried out under the District Engineer, Mr. W. A. Smith. His evidence is that it was completed about the 24th July, 1894—that is, just six days after Mr. Hickson wrote his minute of the 18th. Mr. Smith says that, this being the first work of the kind he had undertaken, he took a great personal interest in it from a scientific point of view, and that he continually referred to Mr. Hickson in the matter. There can be no doubt, from the evidence, that



that he and Mr. Hickson had been talking about the thing—how it was getting on from time to time; so that Mr. Hickson was posted up as to the exact position of matters without going into the details himself. He knew, practically, the state of the work and how it was panning out, and how the cost would come out. What is Mr. Smith's evidence as to the cost? There can be no doubt that what he told the Commission he told Mr. Hickson at the time. His evidence is that he made an estimate as nearly as he could at that time, because he wanted to see how much cheaper the work would be than ordinary work of the kind. In order that he might see what the real cost was, he took particular pains in checking it, and he tells us that he made it out to be £114. After that evidence was given, two gentlemen appeared upon the scene who knew, as they thought, a good deal more about the Strathfield culvert than did Mr. Smith. Those two gentlemen were Mr. James Symonds, the Road Superintendent, and Mr. T. W. Bryant. Mr. Symonds told us at first that, in his opinion, the whole thing was a piece of folly—that it was nonsense to have such a large culvert at all. He further told us that he was sure the total cost was over £238, and that if he could get at the vouchers he would be able to prove that that was so. Mr. Bryant, who was an accountant in the office, and who had never seen the work at all, also stated that it cost at least £238. He also said he would be able to prove that to be the case if he could get the vouchers. Your Honor made an order that they should have the vouchers and everything they wanted in connection with the matter, and you may remember that there was a good deal of trouble—that they alleged that they could not get the papers they wanted or which they thought ought to be there. They said they could not find authority for the original expenditure. They seemed to think there ought to be a minute of the Executive Council, the usual authority being, as a matter of fact, here in the papers all the time. However, they got the vouchers and they went through them, and they brought out the cost of the culvert at £238. That rendered it necessary for the Department to recall Mr. Smith, and after he had had an opportunity to check the vouchers—I will refer your Honor to his evidence dealing with them; for I submit that he dealt with them in such a way as to satisfy your Honor conclusively—it transpired that the actual cost of the work was only £109 18s. 9d., proving that Mr. Smith a little over-stated the matter—that is, by £5—when he first stated the cost was £114. Your Honor will see the importance of this evidence in this way: this calculation of Mr. Smith is arrived at in two different ways; in the first place his estimate of £114 was made at the time to satisfy himself and his chief upon the scientific question which they were investigating together. It was not made so much on the vouchers as by checking the time of the men, the cost of the material, and that sort of thing. Afterwards, when the statement by the Road Superintendent and Accountant had been made, Mr. Smith went over the ground again in a different manner. He got the vouchers which had been collected, and he was able to point out that, according to those vouchers, a great deal of the work which Mr. Symonds and Mr. Bryant had supposed to have reference to this culvert had nothing whatever to do with it, and that his original estimate was substantially right—that is to say, he was quite within the mark, the real cost being only £109. That is so beyond the shadow of a doubt. After all, what is the value of the evidence of such a man as Mr. Symonds in a matter like this? He was not superintending the work, whereas Mr. Smith was there personally superintending it. Mr. Symonds being the Road Superintendent, his duty was merely to pay the men. What also is the value of Mr. Bryant's evidence in a matter of this kind? He was simply an accountant sitting in the office. His duty was to pass certain accounts. What sort of man was he? When he had left the Department, so he told the Commission, the Department had to send for him to adjust Mr. Smith's accounts, leaving the insinuation that Mr. Smith was a bad accountant, or, at all events, that his figures were not worth much—that they could not be relied upon, and that they were in such a state of confusion that Mr. Bryant had to be sent for to put them right. What is the evidence? It is that a certain cheque for £7 12s., which was given to Mr. Bryant to pay into a certain bank, was not to be found as having been duly banked. Mr. Smith was a little anxious about the matter. He knew that Mr. Bryant had had the cheque, and the question was, what had become of it? He sent for Mr. Bryant with the object, as he stated, of getting him to put the thing right, if there was anything wrong or crooked about it. Mr. Smith having this uncomfortable feeling about the matter, Mr. Bryant was called in accordingly. The matter was investigated, and it was found that no one in the Department was at all to blame; that the cheque had been duly paid into the bank, but that the bank, falling into an error which unfortunately so often happens, as I myself find, mixed up one Smith with another, and this cheque for £7 12s., instead of going to the credit of Mr. W. A. Smith, went to the credit of some other more fortunate Smith. At all events the bank put the matter right, and there was an end of it. This is the witness who came here to speak as to these figures; and he was supposed to speak with accuracy, because, if he could not be accurate as to figures, there is an end to the matter at once. As a specimen of this man's accuracy, he tells the Commission, under the circumstances I have just narrated, that he came back to adjust Mr. Smith's accounts. With those few words I think I might safely leave the evidence of Mr. Symonds and Mr. Bryant, and pass on to another matter. I do not think their evidence will weigh with

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your Honor. I submit that Mr. Smith's evidence is conclusive that the cost of this work was as stated to Mr. Hickson, and as stated by Mr. Hickson to his Minister, when he represented that the work just carried out had been so carried out with most satisfactory results, financially and otherwise. This brings me to the question whether this culvert was really a good structure or not. Some attempt was made to show that the minute was incorrect in that respect. We were told by Larkin, the foreman, that he had heard that the culvert had collapsed; and Mr. Bagge also seemed to have got it into his head—he did not know how—that the culvert had collapsed. But, as your Honor knows, evidence has been tendered to the effect that the culvert is all right; that it is standing there now; and that there never was any question of its collapsing. The only thing which happened, I believe, was this—a small part of the compositing got frozen, and had to be made good; and, as Mr. Smith told us, that was the extent of it. That is a small matter, but it is an illustration of the value of evidence which is based upon tittle-tattle—upon gossiping nonsense of this kind. Poor Mr. Bagge had evidently got it into his mind that something had happened to the culvert, but the evidence which has since been given illustrates the value of that sort of testimony. It shows that Mr. Bagge had been misled as other persons have been misled in other and graver matters. I do not think I need refer to this first undue concession, as it is called, any further. It seems to me that that minute of Mr. Hickson's was in every respect a proper and careful minute. It certainly did not seek to give Carter & Co. a monopoly. It simply sought to obtain the Minister's authority for an arrangement with the patentees in the event of the Government's thinking it well to use the patent at any time; and, moreover, there was no inaccuracy in the statement as to the cost. The matter was fairly stated, was fairly put before the Minister, who approved of the patent being used upon the terms suggested if his responsible officers thought it advisable to use it at any time. As a matter of fact the patent has never been used except in the instances I have mentioned. I will deal next with the third undue concession as it refers to this very same matter—that is to say, it involves the Monier patent. The third concession is stated as follows:—

By permitting Messrs. Carter, Gummow, & Co. to obtain Contract No. 77. in an improper manner to the advantage of the contractors and to the disadvantage of the Crown.

That charge, to my mind, if it involves anybody at all, involves five officers all holding very high offices in the State. The first officer involved is Mr. Barling, who is at present a member of the Public Service Board, and who was at that time Under Secretary for Public Works, and also the Chairman of the Board of Reference. The other officers involved are Mr. Darley, Mr. Deane, Mr. Hickson, and Mr. Vernon. If any body is responsible for this contract being let to Carter, Gummow & Co., it is these five officers, who at that time constituted the Board of Reference. Your Honor has before you the way in which the Board of Reference came into being. You have the minute of Mr. Bruce Smith recommending the appointment of the Board, taking the heads of all the sub-departments as members, with the object of dealing with and consolidating, as it were, the practice with regard to contracts. Special reference is made to the new general conditions, which Mr. Bruce Smith thought it advisable to have prepared, because up to that date the various branches had had sets of conditions of their own. That, therefore, was one of the first things with which the Board dealt. One of the other things with which the Board had to deal concerned the tenders. All the tenders came before them, and, if a contract involved a particular department, the officer representing that department, or branch, would no doubt be heard in reference to the contract. If there were anything special in connection with it, his remarks would no doubt carry greater weight than would those of other members of the Board. With that exception, this body of gentlemen, so constituted, were all equal. The tenders for Contract 77, among other matters, came before the Board. As your Honor is aware, when tenders were called, no less than fourteen were sent in at various percentages below schedule rates, Carter, Gummow, & Co. being the lowest tenderers at  $28\frac{1}{2}$  per cent. below schedule rates. In addition to that tender they sent in a lump sum tender of £15,500, with a design upon the Monier system. This matter having come before the Board, a report was written, which has been confirmed by every member of the Board who has been called here. I should have mentioned that four of these officers have been before the Commission, and have given evidence on the matter. The report of the Board upon this contract is to be found upon pages 206 and 207 of the Parliamentary return. It contains a clear account of how the thing came about. Mr. Hickson's own evidence, in conjunction with the report of the Board, makes the matter very clear. The Board say in their report:—

The tenders for this work were submitted to the Board to-day. In doing so, Mr. Hickson pointed out that fifteen tenders had been received, the lowest being that of Carter, Gummow, & Co., at  $28\frac{1}{2}$  per cent. below schedule rates—amounting approximately to £15,757 1s. 9d. The same firm also submitted a lump sum tender for carrying out the work according to a plan sent in by them, for the sum of £15,500. The plan submitted is for constructing the work on the "Monier" arch principle. This system has been extensively used during recent years on the Continent of Europe, with successful results, and Mr. Hickson sees no reason why, under certain restrictions, the opportunity should not be taken to introduce the system in the public works of this Colony.

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The advantages claimed by the patentees are that works can be carried out at a much cheaper rate wherever this method of construction is used. Mr. Hickson said he had no doubt that the design submitted was thoroughly suitable, and likely to be effective; and, as the main principles as regards size and inclination of sewer were as provided for in the departmental design, he was prepared to recommend it for adoption; but if it was decided to accept the tender, a short specification of the work should be included in the bond, and provision also made for the maintenance of the work by the contractors for a certain period after completion.

Mr. Hickson further said that, as Mr. Darley would be the responsible officer for carrying out this work, he had gone into the matter very thoroughly with that gentleman, and Mr. Darley was quite prepared to endorse his views.

The Board, in view of the fact that Messrs. Darley and Hickson are satisfied that the principle is a sound one, and that the adoption of the plan will result in considerable economy, are prepared to endorse the recommendation of these gentlemen, and now submit the matter for the Minister's consideration.

That is the report of the Board of Reference on this matter as it came before them. It being a sewerage matter, Mr. Hickson was evidently the chief speaker with regard to it. The Board would naturally look to Mr. Hickson to explain the matter to them, but, as Mr. Hickson was about to hand over the sewerage works to Mr. Darley, he naturally did not wish to pledge his successor to anything in the way of what may be termed a new departure without consulting him. It appears, further, that Mr. Hickson took the precaution of going very fully into this matter with Mr. Darley, who was to succeed him, before it was brought before the Board of Reference. That is plain, both from the minute itself and from the evidence which is before your Honor. Mr. Hickson was asked some questions as to this matter, and this is the way in which he shortly describes it. I am quoting from his evidence on page 34, Questions 1287-8:—

1287. Will you please tell His Honor what you reported to the Board in reference to the Monier arch? The report of the Board of Reference, which you will find at the foot of page 206 of the Parliamentary paper, ordered to be printed 22nd October, 1895, is the result of the conversation which took place.

1288. What did you say to the Board? When this tender came in on 14th March, it was arranged that the work should be taken out of my hands and handed over to Mr. Darley. I brought the tender and the plans down to Mr. Darley, and we talked over the matter for a considerable time. The result of the conversation was that we both thought it desirable that an opportunity should be given of testing the Monier arch principle, which was acknowledged by all engineers on the Continent to be a very valuable engineering structure, and that the matter should be considered by the Board of Reference. The papers were then sent down to the Board of Reference without any direct recommendation from myself or Mr. Darley. We talked the matter over at the Board of Reference, and the paper to which I have referred you upon page 206 is the result of the conversation.

We, therefore, know exactly what did take place. Mr. Hickson, when this matter was brought before him, took a double precaution. He knew that he would not have the carrying out of the contract; and, as he was going to hand over the sewerage works to Mr. Darley, he took the precaution, when he got this plan and alternative tender, of seeing Mr. Darley, and discussing the matter with him for a considerable time. He took the precaution of thrashing the thing out with Mr. Darley before he moved at all. These two gentlemen considered the matter, and they came to the conclusion that it would be a good thing to take this opportunity of testing this comparatively new thing in this part of the world. What did they do then? As a further precaution, they refrained from writing any minute which might have the effect of influencing the Board, and to a certain extent binding them. If they had joined in writing a minute of recommendation the whole matter would not have been treated by the Board as at large when it came before them, it being peculiarly within the functions of these two gentlemen, one of whom was leaving the branch and the other of whom was taking up the duties. Naturally the Board would have said, "Here is your recommendation. We approve." Probably there would have been no discussion; but these two gentlemen having made up their minds, refrained from writing a minute which might amount to a recommendation, but simply brought the matter before the Board, the whole thing being thereupon discussed. The report which I have read contains, we are told, a true history of what took place at the meeting. It is to the effect that these two officers, Mr. Darley and Mr. Hickson, were looked to to advise the Board upon the technical part of the matter. The question of policy no doubt was considered—that is, as to whether it was a wise thing to introduce such a mode of construction—assuming it to be good. There is not a shadow of a doubt but that the question of policy was gone into; and the evidence of Mr. Barling, the Chairman of the Board, confirms that view. Mr. Barling, in his evidence upon  
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page 202, said that as Chairman of the Board he looked to Mr. Hickson as the responsible officer to give evidence upon technical matters, but that he was one of those who arrived at the unanimous conclusion that the system was a good thing to recommend—not merely that it was a good thing to recommend the adoption of, but that, as a matter of policy, it should be adopted if it was a good thing. Then there is Mr. Darley's evidence. We know his opinion. He gave evidence on the point, which is reported on pages 57 and 58. He confirms what is said by other members of the Board. He goes into the question of cost, and he said that one of the things that influenced him was that in the substituted plan the company had an equally good structure for a less sum of money, the original contract sum being £15,757, and the substituted design being carried out for £15,500. He confirms what Mr. Hickson has told us with regard to what took place at the Board, and upon page 58 he explains why it was that he recommended that bonds should be taken, and why he endorsed the view of Mr. Hickson in the matter. He thought the Monier system a sound system, as far as he could judge, and he thought it would be a good thing to apply to this particular contract. He goes on to say that since that time he had had more opportunity to go into the matter, and that, having done so, he was still of the same opinion—that is, that the advice given was good sound advice. Mr. Deane, the Engineer-in-Chief of Railways, was also examined upon the point, and he confirms the evidence of the other two members of the Board who were examined. Mr. Deane's evidence is to be found on page 61. In answer to Question 2112, he says:—

Speaking for myself, my feeling was this: I was glad of an opportunity to see the principle tested. The reduction in price did not seem a very large one; still, in testing a new principle you cannot expect to get in the first instance so large a reduction as you would probably get afterwards. If the principle were once tested, and if it proved satisfactory, no doubt a large saving could be effected in the future. I understand that this patent was in the hands of these particular contractors. It was therefore a question of dealing with them. The work could not have been done by open tendering; so that the conditions were quite different from those which you would have in connection with an ordinary contract.

Then, in answer to Question 2122, he gives the following evidence:—

The report of the 20th March, 1895, of the Board of Reference, correctly states what took place at the meeting of the Board, does it not? Yes; I have not altered my opinion about the matter at all. In fact, it has been rather strengthened than otherwise as regards the advisableness of adopting the principle. The report is a correct account of what took place.

Your Honor will see that we have the evidence of four of the gentlemen who constituted this Board. We did not think it necessary to call Mr. Vernon, the Government Architect. He is an officer whose time is very much occupied, and had he been called he would merely have confirmed the evidence of his colleagues. That evidence, I submit, establishes this fact beyond any doubt whatever—that if there was any wrong action in this matter the responsibility for that action lies with these four gentlemen, and that responsibility they themselves are prepared to accept—that is, as regards those of them who have scientific training. Mr. Barling, of course, does not pretend to a scientific knowledge of these matters, as he told us. He is not only of opinion that the advice then given to the Board was sound, but he says that from inquiries he has made he would repeat the advice if he were again placed in the same circumstances. He thought a wise thing had been done in making this experiment, as it had been called. The report of the Board shows that the whole thing was threshed out very carefully. The nature of the work was probably thoroughly understood only by the two gentlemen who had given their attention to the matter, viz., Mr. Darley and Mr. Hickson; but to show how thoroughly the thing was thrashed out and the question of policy was considered, it was thought desirable that, as the thing was new, although the office had no doubt as to its stability, the whole risk of it should be thrown on to the contractors. Therefore it was that the Board recommended in their report that a short specification of the work should be included in the bond, and that provision should be made for the maintenance of the work by the contractor for a certain period after completion. That is the history of that report. That report went down to the Minister, and was submitted in the ordinary way through his Under Secretary. Upon that, Mr. Young, who was then the Secretary for Public Works, writes this minute:—

Before approving of this proposal, I should like an estimate of the actual value of the work to be carried out by the contractors\* under the substituted scheme.

Mr. Young asked, as your Honor sees, for an estimate as to the actual value of the work which was to be carried out under the new scheme, the plans of which had been prepared by the contractors themselves. That minute was sent down to Mr. Hickson, and one of the questions that at once arises is: Why was not that estimate made? That, no doubt, was the question which must have struck your Honor when this matter was first gone into. Why was not an estimate made at the time? I submit that on the evidence that question has received a complete answer. The evidence is that Mr. Hickson, as he states in his

his minute, had already had an opportunity to test the comparative expenditure involved in the work according to the Monier principle and according to the original departmental design. On the 28th March, 1895, he wrote the following minute:—

To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm, estimates were made for the work on the Monier system, as well as on the [department's] designs. The result was that the estimate of both works was practically the same. Applying that comparison to this case, it would mean that the departmental estimate for the work under consideration would be £22,000.—ROBT. HICKSON, 28/3/95. Under Secretary.

It will be perceived by your Honor that two considerations weighed with Mr. Hickson. He had paid some attention to this matter. He had already had an opportunity to estimate the cost of the work in these two schemes. He had already had that report of Mr. Bagge, which, as Your Honor may remember, formed the subject of so much discussion here, and in connection with which there were three plans of construction; two of them not upon the Monier system, but the third being upon that system. That was what Mr. Hickson, as I understand it, had in his mind when he wrote that minute. He was satisfied that if fresh estimates were taken out they would come, after all, to the departmental estimate for the work. He thought that if he took out those estimates at that time he must arrive at exactly the same conclusion. I think that the opinion of Mr. Hickson, formed at that time, is fully borne out by the evidence. The question of the cost of this work has been gone into very thoroughly indeed by your Honor; you have had all sorts of evidence as to the cost. Let me first draw your attention to Mr. Hickson's explanation, in answer to your Honor, of what took place. On page 37, in reply to question 1364, he says:—

*His Honor.*] Perhaps you had better make a statement as to the actual facts? The actual facts are these:—When we were arranging for the sewer in connection with the sewage farm three schemes were got out, in order that we might see which would be the most economical. No. 2 scheme—the one which is being carried out—was estimated to cost £6 16s. 11d. per lineal foot. The third scheme, upon the Monier arch principle, was estimated to cost £6 6s. 8d. per lineal foot, or, as I said to the Minister in my minute of 28th March, 1895, practically the same.

That, no doubt, is what was in Mr. Hickson's mind when he wrote this minute. That, no doubt, is the reason why he did not make out an actual estimate of the two works at that time. It would have taken some little time to do. As a matter of fact it would have taken a great deal of time, judging from the evidence of Mr. Davis, who told us that he spent a considerable time in arriving at an opinion as to the cost even when the work has gone as far as it has done now. No doubt these two things weighed with Mr. Hickson when he answered the Minister's minute in the way in which he did. There was the delay and trouble involved in getting out the estimates, and he thought he could safely dispense with putting his officers to the trouble of going through all these calculations, because they had already gone into the thing so thoroughly in connection with another matter, and he felt sure that if they went into it again it would "pan out" pretty much according to the departmental estimate. What is the evidence as to the actual cost of this work? In the first place Mr. Parkes was very much exercised indeed over the schedule upon which the payments were made upon this contract. As your Honor knows, when a lump sum tender is put in it is necessary, in carrying out the contract, that a certain basis should be arrived at upon which to make progress payments. Accordingly a schedule was prepared—as Mr. Parkes at first thought under the superintendence of Mr. Hickson. It was only when his attention was drawn to the papers that he was compelled to see that Mr. Hickson had nothing whatever to do with the schedule, and that it was prepared by Mr. Griffiths, who was the officer acting under Mr. Darley, who had taken over the sewerage works, and who had supreme control of them. It is, perhaps, hardly necessary for me to refer to this schedule, but it is referred to by Mr. Darley upon page 58—questions 2,044 to 2,052:—

2044. This schedule we have heard so much about was prepared by Mr. Griffiths? Yes.

2045. As I understand the matter, it was a schedule made out simply for departmental purposes? That is so.

2046. It is no part of the contract at all? No.

2047. The contractors had no say in the matter at all? No.

2048. The schedule was made out merely to enable your department to arrive at a conclusion as to what the amount of each progress payment ought to be? As a means of valuing the work monthly.

2049. I understand that in making out this schedule you have taken those items which do not involve the Monier system upon the schedule rates originally prepared by the department? Yes.

2050. But with regard to those items which did involve the Monier system you have made no special estimate, but have averaged them among the remaining items, so as to bring the total within the lump sum constituting the contract price? That is so. 2051.

2051. So that you did not go into the question as to the real value of those items which made up the Monier system? I did not.

2052. It is perfectly misleading to state that those items which do not involve the Monier system are being paid for at the rate of  $28\frac{1}{2}$  per cent. more than the contractors were prepared to give for them? Quite misleading.

That clears up the contention of Mr. Parkes that the department were paying this firm of contractors without deducting the  $28\frac{1}{2}$  per cent. which they ought to have got out of them, acting upon the lines of their other tender. That other tender had nothing whatever to do with this lump sum tender. I think it has been made perfectly clear that this schedule of Mr. Griffiths was simply a schedule such as is made up upon every lump sum contract to permit of payments being made as the work proceeds. Then with regard to the estimates which have been made as to the value of this work. On the one hand we have the evidence of Mr. Thompson and of Mr. M'Credie. They make out that the cost of this work is considerably below the departmental estimate, and that instead of the estimate being £22,000 it should amount to only something like £13,371. Mr. M'Credie told us that, as far as he could see, there was nothing special in the carrying out of the work. Those, I think, are the words he used. His estimate was based upon the assumption that there was nothing of a special character in the work. The same observation applies to Mr. Gilliver, who brought out the cost of the work at £2 19s. 11d. per cubic yard—that is so far as the Monier structure is concerned. He also said that there was nothing special in the work. Mr. M'Credie's figures are £1 10s. per cubic yard and Mr. Thompson's figures are also £1 10s. Mr. Williams, another contractor, brings the amount down to £2 5s. That is substantially the evidence which has been brought forward to show that Mr. Hickson was absolutely wrong when he told the Minister that the cost of the work would come up to the departmental estimate. There may have been further evidence in support of that contention, but I think that that is the main evidence on one side. Then, on the other side, we have had a very careful estimate prepared by Mr. Davis, which is to be found upon page 506 in his Memorandum No. 5. Your Honor may remember that that estimate was based upon quantities which had been agreed upon by Mr. M'Credie, Mr. Thompson, and Mr. Davis, so that there can be no dispute about the quantities there given. The only question is as to the value of the work in the Monier portion of the structure. Mr. Davis has gone into that matter very carefully, and he has shown us how he arrives at his results. His estimate of the cost of the Monier portion of the work per cubic yard is £3 16s. 10d. After deducting  $28\frac{1}{2}$  per cent., the total contract comes out at £15,494. This estimate we are further told is based upon the actual time expended by the men in doing the work. Your Honor may remember that that time was kept by Inspector Clymer, who came here as a witness, and whose evidence is to be believed. Mr. Davis, then, bases his estimate on the actual time taken in doing the work. Then we have Mr. Bagge, who told us in one of his minutes that £4 or £4 10s. would be the cost per cubic yard of this particular work. Then, again, there is Mr. Chamier's estimate, which comes out at £4 5s. 8d. per cubic yard. Included in that item, however, is 11s., which he put on for the patent and the risk. With regard to the item of labour, Mr. Chamier's estimate was some 2s. under that of Mr. Davis. He put it down at a lower figure than did Mr. Davis; but he explained that by saying that he had only made an estimate of the labour, and that he could not get at it actually without knowing the actual time spent on the work. He went on to say that if he were told as the result of accurate time-keeping that so much time had been expended upon the work, his estimate would be altered accordingly. His estimate came to £4 5s. 8d., and if the 11s., to which I have referred, is deducted from that amount, it will be found that he substantially agrees with Mr. Davis in every particular. Then we have the evidence of Professor Warren. His estimate will be found upon page 319. It will be seen that he brings out the cost at £15,691, or £4 1s. 2d. per cubic yard. We have also the evidence of Mr. Gummow upon this point, and I suppose he is to be believed, although he is one of the contractors. Upon page 641 he gives the actual cost. His evidence is not founded upon a mere estimate. It is founded upon what has actually been done—the time which it has taken to do the work, and the amount which the contractors have had to pay for it. His figures come out at £3 14s. 6d. per cubic yard, no profit at all being allowed in that amount. I think that that is substantially the case as it presents itself upon this one particular matter. I submit that the evidence is overwhelming, to the effect that, if Mr. Hickson had taken out the estimates at that time, the conclusion to which he would have arrived would have been exactly the same as before. There would have been further time occupied, and a great deal of further trouble. Perhaps, in the light of events, it is a pity that that time and trouble were not taken, so that those who are bringing forward any charge upon that point might have been at once silenced. At all events it was not done. Whether it was a mistake of judgment or not, it is, I submit, a very small matter after all; because any officer charged with such vast contracts and work as was Mr. Hickson, especially at a time when he was going from one branch to another, is liable to make errors of judgment. Perhaps

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your Honor may think that it would have been better on the whole if Mr. Hickson had not relied upon what he thought quite sufficient to satisfy anyone, viz., upon what he had done before in considering this matter with Mr. Bagge, and that it would have been wiser, instead of relying upon that, since the Minister asked that an estimate should be taken out, to take out an estimate again. It is satisfactory to know, however, that if Mr. Hickson had acted on those lines he would have come to exactly the same conclusion, viz., that the cost of the work would pan out pretty much as he had informed the Minister it would. The Minister's approval would have been given after considerable delay, and the same results would have ensued. I do not think I need labour that part of the case any more, except to refer your Honor to Mr. Hickson's evidence upon page 565 :

17133. Are you satisfied, if you had complied with Mr. Young's request, and had gone into the matter fully at that stage, as to how the estimate would have worked out? I believe it would have worked out exactly in the way I indicated in my minute—in fact it would have been a little higher than the amount stated in Mr. Davis's memorandum, because I see that Mr. Davis's estimate is £3 16s. 10d. a yard, whereas Mr. Bagge, in making his estimate, put down the amount at £4. If I had sent the estimate back to Mr. Bagge, he would have put in the same figures again, so that it would have worked out a little higher than the estimate Mr. Davis has given.

17134. The experience you have gained from the actual construction of the work confirms you in the view you then laid before the Minister? Yes; and if I had the same circumstances before me to-morrow I should take exactly the same action.

That, in a nutshell, explains Mr. Hickson's position in that matter. He acted *bonâ fide* to the best of his judgment, in the firm belief that the figures would pan out in a particular way. He now says that, having heard all the evidence, and the work being almost completed—when the cost can be more accurately calculated—he was fully justified in giving the recommendation he did. I do not think I need say anything more upon the question of the cost of the Monier work in Contract 77. It only remains for me to draw your Honor's attention shortly to the nature of the work, and the question whether these officers were right in letting a contract involving work of this nature. Upon that point, I think the evidence has satisfied even Mr. Parkes that this Monier patent is not the useless risky thing which he told the House it was. Your Honor has seen the work.

*His Honor* : Yes. I really do not think it is necessary, Mr. Smith, to labour that part of the question.

*Mr. Smith* : Quite so. Your Honor has seen the work, and has had the advantage of the evidence of Professor Warren and of Mr. W. A. Smith. We have also the testimony of Mr. Baltzer, who fortunately just returned in time from Germany, where he has been giving the matter attention. He was able to produce, for your Honor's inspection, a number of photographs representing works which have been carried out upon the Monier system, and which certainly, if I may say so, seem very wonderful in their way. The system would seem to be a wonderful invention, and one which certainly deserves a good trial in this Colony if it can be done without any considerable risk.

*His Honor* : In relation to that, it has struck me that the photographs which Mr. Hickson originally produced were not in any way made evidence. These photographs, together with some particulars with reference to the system, had come under Mr. Hickson's notice before the tender of Carter, Gummow, & Co. for Contract 77 was entertained. I think, therefore, that they ought to be in evidence. I intended to ask for them for this reason : that the main question is the state of Mr. Hickson's mind, more than the actual facts which have since been proved. The question is, what had come to Mr. Hickson's knowledge at the time he made the recommendation he did make? I therefore think that those particular photographs, together with the other photographs which have been produced, ought really to stand in the position of evidence. Mr. Hickson produced a book containing some photographs, and in connection with it he gave the size of some of the arches which were represented.

*Mr. Smith* : In going through the evidence, I did not make a note of that matter. I confess that it did not strike me in the way in which your Honor has put it, in relation to what was in Mr. Hickson's mind. I had relied rather on outside evidence on that point. I would refer your Honor to questions 1575 and 1576; I presume that the book referred to in question 1575 is the book to which your Honor refers. Those two questions and answers are as follows :—

1575. Very much below the quantity which appears in Scheme No. 3? Considerably less. This is not mere theory. I can show you what was actually done. You will see in the book I hand you an illustration of a bridge which has actually been built. The span is 121 ft. 4 in., and the thickness of the crown is only 6 $\frac{3}{4}$  in., whereas our Monier arch at Johnstone's Creek has a 75-ft. span and is 12 in. thick.



1576. What weight is the bridge to which you are referring calculated to bear? The bridge I have shown you was tested on 14th November, 1890, in the presence of the President of the Zurich Association of Engineers, firstly, by submitting it to an evenly distributed load over one half of the arch, equal to 61 lb. to the square foot, and no measurable deflections could be recorded. It was secondly tested by a moving load of 5 tons being drawn across the bridge, when no vibrations were recorded by the gauges on the loaded or unloaded portions of the bridge, which results were considered satisfactory.

*Mr. Gummow*: I happen to be aware that Mr. Hickson, previous to writing the minute which is referred to, had seen the book which had been written by Mr. Baltzer, together with the photographs it contains. We are in a position to produce the negatives of the photographs which Mr. Hickson saw, and the manuscript from which the type-written matter in the book was taken. The book is dated the 1st January, 1896, but the original documents can be produced which Mr. Hickson saw.

*His Honor*: I understand that Mr. Hickson saw photographs of different structures, and the calculations which had been made in relation to them. If, Mr. Gummow, you are in position to produce the Mss. and photographs which Mr. Hickson saw, I should consider them material. I presume that the photographs which Mr. Hickson saw at the time to which you refer are the same as those which are contained in the book.

*Mr. Gummow*: Yes.

*His Honor*: I will allow the matter to stand over for the present, and you can proceed, Mr. Smith, on the assumption that what Mr. Hickson then saw is to be considered material evidence in the case.

*Mr. Gummow*: I will produce the original photographs and Mss. to-morrow.

*Mr. Smith*: I submit that there is ample evidence before the Commission to show that Mr. Hickson had studied this matter to a very great extent at this time, and that he and Mr. Darley, as I said just now, had discussed it very thoroughly. Mr. Darley tells us that, although he did not then know so much about the system as he does now, he was, at all events, satisfied to join Mr. Hickson in advising the Board that it would be a good thing to introduce if it could be done without any risk to the Government. That advice, I submit, has been fully borne out by the evidence which has since become available on this particular matter. It shows conclusively, moreover, that these two gentlemen were acting in the matter *bonâ fide*, and that their advice was perfectly sound. I will not say anything more on that particular matter now; but a good deal of reference has been made in the course of the evidence to the impropriety of allowing this plan which was sent in with the alternative tender for Contract 77 to be prepared by an officer of the department. I think I may take it that that matter has been pretty well cleared up now. Fortunately Mr. Baltzer, who made the plan, has returned to the Colony, and he has been able to explain to your Honor—although there was sufficient evidence as to the facts without his explanation—that this plan was really done by him out of office hours. Mr. Baltzer is a man who your Honor could see from his style and bearing takes an intense interest in his profession. He has a turn that way—in fact I think your Honor called him a “designing” man. He has been in the habit of making the most of his spare moments in preparing plans of this kind. Whether they were going to be used is another matter altogether. He was always preparing plans, so that no importance attaches to any suggestion of impropriety in his preparation of the particular plan which went in with this particular tender. There is no doubt whatever that Mr. Baltzer had nothing whatever to do with putting it in. He drew out the plan and handed it over to the contractors, who handed it in with their tender. I come now to the second undue concession alleged to have been made to this firm by reason of young Mr. Hickson being an interested party. It is as follows:—

By permitting Messrs. Carter, Gummow, & Co., to obtain Contract 79 in an improper manner, to the advantage of the contractors, and to the detriment of the Crown.

Contract 79, as your Honor is well aware, was one of the North Shore contracts. Tenders for that contract were received on 10th June, 1891. The lowest tenderers were Bond and Hudson, the amount of their tender being £36,900. Carter & Co. came next, their tender being £39,890—that is to say, their amount was about £3,000 more than the amount of Bond and Hudson's tender. Your Honor knows, according to the evidence, and according to the papers also, that this contract was not proceeded with by the Government by reason of the want of money. The Government were unable to go on with the contract, and the consequence was that, although Bond and Hudson's tender was accepted, the works were not proceeded with for some months. Bond and Hudson wrote a letter on 28th September, 1891,

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asking to be allowed to withdraw their tender, and also for a return of their deposit. That letter will be found on page 270 of the Parliamentary return. It is signed by Mr. Bond for Bond and Hudson, and is as follows :—

*In re* Contract No. 79, Sydney Sewerage Works.

Dear Sir,

88, Sussex-street, Sydney, 28 September, 1891.

On 10th June, of this year, we had the pleasure of submitting a tender for the above works, and, we believe, were successful in being the lowest tenderers.

We have been anticipating the acceptance of our tender for some months, but, not hearing from your Department, we have in the meantime, entered upon other obligations, and must consequently respectfully ask you to permit us to withdraw our tender, and to return us the deposit attached thereto now lying in your hands, viz., £369.

We are, &c.,

C. B. BOND  
(Bond and Hudson).

I find I was wrong in stating that their tender had been accepted. As a matter of fact there was no formal acceptance; but there is a minute which appears upon page 271 of the Parliamentary return to the effect that the tender had been recommended for acceptance on the 10th June. Mr. Barling at once says "Return deposit," and it was of course returned. Then the tender was allowed to be withdrawn. Of course these people had been kept on the string from the 10th June to the 28th of September, and having entered into other obligations, as their letter sets forth, they wanted their deposit money back. That being so, the Department had only one course open to them, viz., to return the money. The thing could not be kept hung up for ever, and the deposit money was returned. In the original charges which were made, there was a charge against the Department of allowing this tender to be withdrawn, and of returning the deposit money. That charge appears to have been abandoned. It is obvious to anyone that that is the only course the Department could have taken. Under these circumstances, Carter & Co. were left in the position of the second tenderers. Perhaps I had better say, now that I am dealing with Bond and Hudson's withdrawal, that, as your Honor will see from the papers, all that the Department had before them were these facts—That the tender had been sent in on the 10th June, and that from that date until September nothing was done. The Department then received a letter signed by the tenderers asking for a return of their deposit, and, as I have said, there was only one course to be taken in reference to that application. The Department had no knowledge whatever that Bond and G. Hudson had, as we are now told, been bought off. Mr. Hickson, in his evidence, told us that the allegation made before this Commission was the first that he had heard of it; that he had not heard a word of it until it came out here in the course of the inquiry. He had not the slightest idea that Mr. Carter had arranged with Mr. Bond for a withdrawal of this tender for a certain consideration. I submit that the Department has nothing whatever to do with that matter; it does not affect their action in any way whatever. It is quite evident from the papers, and also from the evidence, that their action was absolutely *bonâ fide*. They were asked to return the deposit of Bond and Hudson, because the firm had incurred other obligations, and in the ordinary course the deposit was returned to them. That was quite an ordinary course of things; but whether it was a proper thing for this firm of contractors to buy off the first tenderers or not is a matter for them to satisfy your Honor upon if necessary. It is not necessary for us to express any opinion upon that matter, either one way or the other. It is one which entirely concerns the contractors. All the Department knew was that the money had to be returned—and it was returned. There is no escape whatever from that position. On the 6th October, 1891, after the withdrawal of the tender, Mr. Hickson wrote a minute recommending that fresh tenders be invited. It appears that nothing at all was done with regard to this contract until 22nd February, 1892. On that date we have this recommendation of Mr. Hickson as to calling for fresh tenders, approved by the Minister. In the meantime trouble had arisen with regard to another contract of these contractors—No. 72, the Shea's Creek contract. Your Honor will remember that the evidence as to that contract is that Mr. Hickson, in the exercise, as he said, of a clause in the contract, virtually stopped it by writing his letter of 13th October, 1891. As a matter of fact, the Government had not money with which to go on with it. The contractors were therefore informed that after a certain date the contract would have to be stopped—that it was not to go any further. In giving that notice Mr. Hickson relied upon a certain clause in the contract which has been very much discussed here. That clause undoubtedly gives the engineer power to cut out a certain portion of the work—13 or 27 chains of the lower portion of the channel. That portion was not to be constructed at all unless the engineer gave written orders to that effect. But the stoppage of this work was a different and an altogether larger thing than was contemplated by that clause. Mr. Hickson, however, in seeking to do the best he could for the Department relied upon that clause in the service of his notice. The work was stopped, and it was not resumed again until the 1st April, 1892. Your Honor well knows what a serious thing it is to stop a contract of this kind. Anyone who has the slightest acquaintance with matters of this description knows that in stopping a work of this kind the Department renders itself liable to a claim for very heavy damages. There have been cases before the Courts again and again arising out of such claims, and your Honor knows what a difficult thing it is to meet them. Claims may be sent in,

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as anyone who has had experience in these matters well knows, containing the most ridiculous items. The claims against the Government are made as large as possible; and they are perhaps put in with the object of making a good fight before a jury. However absurd they may be, they are fought, as everybody knows; and your Honor knows how difficult it is, when the department gets before a jury, to meet a claim of this kind, to get the Government out of it with any degree of success. That, at all events, was my short experience when I have had to fight these matters for the Government.

*His Honor*: That hardly needs argument, I think, Mr. Smith.

*Mr. Smith*: I will leave that point, if your Honor is of that opinion. Mr. Hickson must have known that, as soon as the notice to which I have referred went out, he would get back from the contractors a claim of some sort; and, surely enough, back came a claim, details of which were drawn up by Mr. B. C. Simpson, who is pretty well known in this community as an engineer, and as a very able man—a man who makes a very good witness indeed in these cases. However absurd some of these items may appear to your Honor to be—and there can be no doubt that if the claim had been contested some of them would have been knocked out—the fact remains that there would have been a difficulty in getting the Crown out of the matter without having to pay a very substantial sum of money. Mr. Hickson evidently had this in his mind; he had various considerations of that kind before him, and he thought that if by any means the thing could be settled on reasonable terms it would be a very good thing indeed. What was the result? When the Department were going to proceed with Contract 79 it was found that Carter & Co. were the second tenderers on the list. Mr. Hickson, it is true, had recommended that fresh tenders should be called, although it is not an unusual thing for a contract to be given to the second tenderer, without calling for fresh tenders, under certain circumstances. That, I say, is not an unusual thing; and if any evidence of that were wanted, perhaps I could not do better than refer to the case mentioned by Mr. Parkes of the contractor on one of the northern rivers who had taken up a contract which turned out to be a work of impracticability on account of the drift of millions of ages of sand. As fast as the contractor cleared it away it came down upon him again. It turned out afterwards, as your Honor may remember, that the matter had nothing to do with the sand, but that the man was not able to carry out the work. While he was trying to get a concession from the Government, he quietly withdrew all his plant from the site of the works and cleared out. Mr. Hickson, on being advised of this by telegram while the man was in his room, at once turned him out of the office, and very properly too. I refer to that case as an instance of a contract being given to the second tenderer as a matter of course. Papers were produced showing that this contract was given, as Mr. Parkes supposed, to a man named Foord. Mr. Parkes said that this man had been treated in a very harsh way, but it turned out that nothing of the kind was the case. Ford was the first tenderer, and threw up the work without signing the contract, forfeiting the small deposit. The contract was then given almost as a matter of course to the second tenderer, so that we could not have a better illustration of the practice than that which Mr. Parkes happened to light upon. Mr. Hickson's reason for not giving the work to the second tenderers, and for recommending that fresh tenders be called, as he himself stated, was, first of all, that some time had elapsed, namely, from the 10th June to 6th October, since tenders were invited; the other reason being that there was a considerable difference between the amounts of the first and second tenders, namely, some £3,000. That is why he wrote his minute of 6th October, recommending that fresh tenders be called. Nothing was done until 22nd February, and in the meantime the Shea's Creek trouble had cropped up. Here were the Government confronted with a serious claim. Mr. Hickson, from his experience, knew that, however good the answer might be to many of the items in the claim drawn up by Mr. B. C. Simpson, the Government stood the risk of being mulcted in damages to a heavy extent. Estimating on the basis that the contractors claimed £4,000, Mr. Hickson came to the conclusion that, at all events, the Government would stand to lose £2,000 over the matter—that they might be cast in damages to that amount. And, although he had written his letter of October, in which he stated that he had stopped the contract under certain powers which he thought he possessed, it must be apparent to anyone who reads that particular clause, that it would have been a very risky thing indeed to rely solely upon the powers contained in it. It was only put forward as a piece of bluff to keep the contractors from prosecuting such a claim as I have indicated; but, when it was seen that the contractors were not going to be bluffed off in that way, and that things were assuming more serious proportions, Mr. Hickson had to consider what was the best thing to do for the Government, and that was how it came about that he saw Mr. Lyne on the very day after the minute approving of the recommendation that fresh tenders be called. It was upon that that Mr. Hickson's minute of the 23rd of February, 1892, was written. He then wrote:

Since writing my minute of 6/10/91, complications have arisen with Carter & Co., *re* their Contract No. 72 having been stopped. They have made large claims on this account, some of which no doubt could not be entertained, but on some items they have made a good case. They are prepared, if they obtained this work, to waive all claims on No. 72. As their tender is a reasonable one, and some £3,600 below the estimate, I think it might fairly be accepted. If this course were adopted, work would be given at once to a large number of men.—R.H., 23/2/92. Under Secretary. Important.

According

According to the evidence of both Mr. Lyne and Mr. Hickson, Mr. Hickson saw Mr. Lyne, and that gentleman thereupon wrote the minute which follows, under the same date:—

As Mr. Hickson thinks Messrs. Carter & Co. could make good a claim for something like £2,000 as compensation on Contract No. 72 (Moni-street, partly), should they be willing to forego this claim, their tender may be accepted for construction of the main outfall sewer, North Sydney—£39,890, as worked out at schedule rates. If this firm will not agree to the condition imposed, fresh tenders to be invited.—W.J.L., 23/2/92.

That appears to be the history of how it was that this contract came to be given to Carter & Co. I think your Honor will come to the conclusion that it was a wise and reasonable course of action both on the part of the Minister and also on the part of the officer who was responsible for the advice given to him, and for the way in which the matter was put before him. If your Honor will refer to Mr. Lyne's evidence on page 260 of the minutes of evidence, you will see that he there refers to the matter. He shows the way in which he looked at it. Of course he could not be expected to remember all the details; but in answer to Question 9170 he gave the following evidence:—

9170. Do you recollect Contract 72 being re-started? I do not recollect it by the number. In any case, it is so long ago that I am afraid that I should not have a distinct recollection of what took place. I do remember writing the minute which you have read, and I remember that that amount of £2,000 was a consideration with me in determining whether the other contract should be proceeded with by this firm. I wished to avoid any litigation or trouble.

He could not be expected to go into the question of whether there was a good and valid claim in respect of the Shea's Creek contract; but he knew enough of such things to know that litigation was a very undesirable course if it could be avoided; and, with a view to avoid it, and without spending a single shilling of the Crown's money, he got a settlement. This settlement gave Contract 79 to the firm of contractors who were the second tenderers at the original calling for tenders. So your Honor will see, from whatever point of view you may look at it, that a reasonable course was taken. I do not think it was open to any contention other than this—that it was the best thing that could have been done for the Crown, and that both the Minister and the officer immediately responsible for it deserved praise and commendation rather than reproof of any kind. I do not think I need go into that matter any further. I have, perhaps, gone into it more fully than was necessary. Your Honor will bear in mind the dates which have been alluded to. This contract was let to Carter & Co. on the Minister's approval in February, 1892, and it is charged that it was so let because young Mr. Hickson was an interested party in the firm of Carter, Gummow, & Co. The evidence is, however, that it was not until April, 1893 (more than twelve months afterwards), when young Mr. Hickson was retrenched. So that at that time young Mr. Hickson had no connection whatever with the firm of Carter, Gummow, & Co., but was an officer in the department. There can, therefore, have been no possible connection between the employment of young Mr. Hickson by the firm and the granting to the firm of Contract 79. It is absolutely past comprehension how anyone in the position of Mr. Parkes, with all the evidence which has been tendered to the Commission in reference to this matter before him, could have included this charge in the amended list which he handed in as recently as the 4th September. In the face of the most convincing evidence to the effect that there could have been no possible connection between young Mr. Hickson's connection with the firm and the granting to the firm of this contract, this charge is put forward. I say that the whole thing is of a piece, and this is about the best illustration we could have of the utter recklessness—the utter want of consideration observed by Mr. Parkes in bringing forward these charges. I think I have now disposed of all the matters which we have under this charge relating to young Mr. Hickson. Perhaps I had better next deal with Contract 77, as I have already referred to it. There are one or two charges in connection with that contract which perhaps had better be dealt with at once. The first charge in relation to this contract is as follows:—

With calling public tenders for Contract 77 upon plans for elaborate and costly work, and allowing Messrs. Carter, Gummow, & Co. to submit a plan of their own upon a patent held by them and an officer of the department and at their own price, unchecked by the department as to real cost, by which Messrs. Carter, Gummow, & Co. got an advantage over the Crown of £4,000.

I think this charge appears to be pretty much the same as one of the others with which I have already dealt, except that it is in different words. I think I pretty well dealt with this matter in the few remarks I made as to the acceptance of the contract. The only point to which I perhaps ought to allude is the reference to this patent as being held by the contractors and an officer of the department. The words "and an officer of the department" and some other words were added to the charge when it was submitted in the amended list on 4th September. That is one of the numerous amendments which have been made by Mr. Parkes in the course of this inquiry. Whether any importance attaches to it or not I do not know. At all events, the department thought it necessary to clear the matter up, and for that purpose

purpose I asked Mr. Hickson some questions about the practice of allowing officers in the department to have an interest in patents. Your Honor may remember the evidence Mr. Hickson gave upon that point. He said that although he himself would not hold a patent against his employers he thought that, as a matter of policy, it would be unwise to check young officers of the department in the use of their brains, and in making the best they could out of any invention they might have been fortunate enough to light upon. I submit that that is a very reasonable thing to do, because it encourages them to work. We have had evidence as to the way in which Mr. Baltzer used to work in these matters. He appears to have taken infinite pains over the Monier system among other matters. He was not too highly paid as a Civil servant; and he had not the necessary funds to finance him in the getting out of a patent. He thought, however, that since he had taken so much trouble in the matter he certainly ought to take one out. He therefore approached Mr. Carter, who financed him through the thing, and, as far as I can make out, that is the whole history of the affair. I do not see that there is any objection to this patent's being held by two members of this firm of contractors and Mr. Baltzer. The firm appear to have found money, while Mr. Baltzer found the brains, and, together, they obtained the patent which stands in their three names. It was a perfectly honest and upright transaction. Mr. Baltzer at that time had no connection with the firm of Carter & Co., and was working in the office. The second charge under the heading of Contract 77 is as follows:—

With deceiving the Minister as to the true cost of the Monier patent by minutes written by Robert P. Hickson, the then Engineer-in-Chief of the Department.

That has already been dealt with, and for the life of me I cannot put my hands upon any evidence that tends to show that there has been deception of any kind. I must leave it to Mr. Parkes to point it out. We come now to the third charge in relation to this contract:—

With deceiving the Minister, by which he (the Minister) accepted of certain security, which was of an improper and useless nature, for the stability of the patent for a term of three years, the deception being contained in minutes written by Robert Hickson, the then Engineer-in-Chief for Public Works, knowing that the security was not of a proper nature to submit.

The words "knowing that the security was not of a proper nature to submit," were added on September 4th to the original charge. That is another of the numerous amendments to which I have already referred. As to the security which is here alluded to as being of an improper and useless nature, your Honor may remember that that question was made a strong point of when the matter was considered before the Board of Reference. This Monier system being a new thing, it was made a condition of the contract that the contractors should give security that the work would stand for a certain number of years. Carter, Gummow, & Co. seem to have objected to that course. A bond was, however, prepared, by which your Honor will see that the Contractors were bound to maintain the work for three years. Your Honor will see the following clause in the letter of the Under Secretary for Public Works, Mr. Barling, to Messrs Carter, Gummow, & Co., under date of 11th April, 1895:—

A fixed deposit receipt, in favour of the Secretary for Public Works, for the sum of £775, will be required as security for the due performance of contract within the stipulated time, and a personal bond in the sum of £12,000, and two bondsmen in the sum of £6,000 each, in connection with the maintenance as set out in the supplementary specification. Will you be good enough to notify to me your assent to these terms, and at the same time submit the names of two responsible persons who are willing to act as your sureties.

Messrs. Carter, Gummow, & Co. seem to have thought that requirement was a little bit too stiff. They did not see why, as they put it, a firm of their standing should be required to give sureties at all, and on the 4th April, 1895, they wrote the letter which will be found upon page 208 of the Parliamentary return:—

Sir,

North Sydney, 4 April, 1895.

We have the honor to draw your attention to the conditions upon which the acceptance of our tender depends for Contract No. 77, Balmain Sewerage Works, and to our conversation with you of even date in connection with security required for its due performance.

We respectfully submit that our personal sureties for the amount necessary should be taken for its completion and maintenance and as a sufficient guarantee for the proper carrying out of the work.

We are a firm of sound financial standing, well and favourably known to your department as contractors for many large and important contracts extending over a period of eight or nine years under the Departments of Harbours and Rivers, and Roads, Bridges, and Sewerage, which facts we trust will satisfy you as to our *bona-fides* in this matter.

We have, &c.

CARTER, GUMMOW, & CO.

Upon that letter Mr. Hickson wrote the long minute of the 5th April, 1895, which has been so frequently referred to in the course of the inquiry.

His Honor, at 1.5 p.m., adjourned the inquiry until 10 a.m on Thursday, 1st October.

C. E. R. MURRAY,  
Commissioner.

THURSDAY,

THURSDAY, 1 OCTOBER, 1896.

His Honor, the Commissioner, sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, bond clerk, also attended.

*Mr. Ernest Smith:* At the hour of adjournment yesterday I was dealing with the third charge which Mr. Parkes has preferred in connection with Contract No. 77, and I think I had drawn attention to the letter of Messrs. Carter & Co., objecting to the requirements of the Department that sureties should be given for the maintenance of the work in addition to their own names. Upon that letter Mr. Hickson wrote his minute of the 5th April, 1895, which appears upon page 209 of the Parliamentary Return. He says:—

Messrs. Carter and Gummow ask that their own "personal sureties for the amount named," *i.e.*, £12,000 (an amount which they do not dispute), "should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work."

They go on to say that they are "a firm of sound financial standing, well and favourably known to the Department as contractors." This is quite true; they are a firm in which I have every confidence. They have done a great deal of work under me, and I can testify that their aim always has been to turn out the very best class of work possible. At the same time, misfortunes happen the very soundest firms of contractors, and the Department must look a little way into the future. Their own bond for £12,000 would be really of no use if they were unfortunate enough in the meantime to become bankrupt.

I think, therefore, it is right that the sureties should be insisted upon. They give the names of two men, Mr. George Forrest and Mr. James Gillan. From inquiries made I believe these men to be financially sound; and, I think, if their names were accepted as the sureties in the penal sum of £6,000 each, the Department would be secured as far as it is reasonably possible to be.

That minute was sent on to Mr. Darley for report on the same day; and three days afterwards he wrote as follows:—

I concur with Mr. Hickson. I think, in accepting a new patent of this kind, and adopting it on a large and costly contract, that the Department cannot be too careful in securing its position by leaving all the risk on the hands of the contractors and patentees. I therefore recommend that the personal names be required for further security. The names mentioned may, I think, be accepted.

That is sent on to the Minister for approval of the course suggested as to the sureties, Mr. Young approving on 10th April. Your Honor sees that that was how it came about that the security for the maintenance of this work, which was recommended, as you will see, by the Board of Reference in their report, recommending the acceptance of a lump sum tender, took this form, *viz.*, a bond to which the sureties, in addition to the contractors themselves, were Mr. Forrest and Mr. Gillan. It is to that, I presume, that exception is taken in this charge, which is to the effect that the Minister was deceived in accepting of certain security which was of an improper and useless nature. Whether this was a proper security to have taken or not will depend, as far as I can make out from the line of examination which has been adopted, upon the answer to two questions, *viz.*, whether the officers who were responsible for accepting these names had satisfied themselves as reasonable men should do with regard to the substance of the bondsmen, and, secondly, whether there was any other consideration arising from the position of these suggested bondsmen, by way of their connection with the contractors, which rendered them, on that account, objectionable. With regard to the inquiries which were made as to the means of these two bondsmen, we have had the evidence of Mr. Hickson, of Mr. Darley, and of some others. Your Honor may remember that, as his minute shows, Mr. Hickson was at this time handing over the control of these works to Mr. Darley, and therefore, although he had satisfied himself as to the fitness of these bondsmen, he took the precaution, as he did with regard to the recommendation of the acceptance of the tender itself, when it came before the Board of Reference, to have the papers sent on to Mr. Darley. As your Honor sees they were with Mr. Darley for three days before he sent on a recommendation that the names might be accepted. So far as Mr. Hickson is concerned, I think his action in this respect must meet with approval. He would not make any recommendation himself, although in his own mind he appeared to have been satisfied; but he sent the papers on to Mr. Darley, and upon them Mr. Darley wrote his recommendation. This charge, therefore,

therefore, if it involves anyone, involves these two officers, Mr. Hickson and Mr. Darley. They are jointly responsible for having advised their Minister that these names should be accepted. I should like here to say one word as to the method adopted in those cases in which names are submitted to the Department as sureties for any particular purposes. The evidence on that point is perfectly clear. The inquiries that are made are of necessity not made in writing. If the head of the Department who has to inquire into the matter had any doubt about the names submitted, the course usually adopted, we are told, was to send down an officer of the Department to the Government Bank—in this case the Bank of New South Wales—and through that bank to get inquiries made at the bankers of the individuals whose names had been submitted. That was always the course pursued. Naturally the Department would not go straight to the banks of the individuals and ask for information of this kind, because if they did they would most probably receive a very short and decisive answer. In other words, they would be told that the information could not be given. The practice therefore was always to make the inquiries through the Government Bank. Mr. Hickson apparently does not go so far as to say that he actually took that course in this case. What he relied upon as being satisfactory evidence in his own mind was more a general knowledge of the position of this firm in Adelaide. Mr. Hickson has explained that he knew that Mr. Gillan, at all events, was a partner of the firm in the Adelaide contract, and that he knew what the position of the firm was. He said that, some time before he had a conversation with the manager of the Bank of New Zealand in Adelaide, Mr. Kane, which had satisfied him that Mr. Gillan stood very well. He said in his evidence on page 177, questions 6527-8-9 :—

6527. What position do you say Mr. Kane occupied then? He was the manager of the Bank of New Zealand in Adelaide.

6528. When you accepted Mr. Gillan and Mr. Forrest as sureties did you know they had an interest in the firm? I knew that they had not an interest in that particular contract.

6529. Did you know that they had had an interest in the contracts of the firm generally? I knew that their names had appeared in connection with other contracts.

He went on to say that the opinion he then formed as to the soundness of the position of these men had been confirmed; and he said that he had seen the manager of the Bank of New Zealand here, who had confirmed his opinion. With regard to the conversation he had with Mr. Kane, he gave this evidence:

6546. Do you know how it came about? We were talking about the firm generally, and, as an official of the bank, he spoke in the highest terms of the firm; in fact the expression he used, as far as I can remember, was that he would trust any one of the firm to any extent, and that they were all well-to-do persons.

So your Honor sees that Mr. Hickson had a very clear and strong impression in his mind at that time as to the stability of the firm in Adelaide. He knew that these two gentlemen whose names were submitted were partners in the Adelaide transaction, and, that being so, he felt justified in forming the conclusion which was afterwards confirmed by the communication which he had with the manager of the Bank of New Zealand here. But, as I said, the matter was sent on to Mr. Darley, who, in his evidence, mentions the practice in cases of this kind. He points out that there was never any detailed inquiry as to the property of the individuals whose names were submitted, but that the inquiry was more of a general nature as to how they stood financially. Your Honor well knows, as a matter of business, how difficult it would be in every case to go into detailed inquiry in these matters. I suppose that if one were to go to a bank and ask for information they would not found their opinion upon any detail examination; but it would be a sort of general impression which business men can pick up as to how their fellow business men in the city stand; and it was more with reference to that that Mr. Darley spoke. He says distinctly that he made inquiries, and he explained the way in which it was customary to make those inquiries. They appear to have been made by sending an officer under Mr. Darley to the bank. Mr. Darley said he had no doubt that that course was taken in this case; but after leaving the room, and after questioning his officers, he found that not one of them could say that the inquiries had been made. He came back before the Commission a few days afterwards, and, after stating that his officers said they could not remember having made the necessary inquiry, he said—

I am still under the impression that inquiries were made by one of the usual officers, but I afterwards saw the officers who would be likely to make the inquiries, and none of them could recollect having done so. On looking up the matter, I find that the whole office was at that time in a state of chaos. Departmental changes were taking place. My chief clerk was taken away from me, and I had not him to refer to. Some temporary officer was acting in his place. Mr. Conley, the officer who used to make inquiries in such cases, does not recollect my asking him to do so. However, I would certainly say this—that I made the usual inquiries and obtained the necessary information.



information. I was at that time working partly in this office and partly in the Water and Sewerage Board Offices. I was going backwards and forwards from one office to another. Moreover, I was not at all well at the time; in fact, the doctor has ordered me to desist from further work, so that I have not a very clear recollection of what took place. I cannot tell you now who made the inquiries, but I am certain that I got the necessary information, because I was always most particular in obtaining it. We had a regular system of carrying out that part of our duty, and it certainly would not be likely to have escaped my attention at that time, because the names submitted were then quite unknown to me. I am certain that I did not regard the matter as one of form. I must have made the usual inquiries.

It will be seen that Mr. Darley there accepts fully and frankly the responsibility for the advice which he gave. Your Honor must know that it would be absolutely impossible for a man who has so many of these matters to deal with to remember exactly the way in which he came to a certain conclusion in a certain case, and to remember the exact details of the evidence upon which he formed his conclusion, especially in an affair of this sort. It is always a delicate matter to discover how a particular man stands financially, and it is not at all to be wondered at that Mr. Darley cannot now tell your Honor how it was that he came to draw his conclusion. But one thing he is perfectly certain about—that he did not treat the matter as one of form. He did make inquiries, and those inquiries led him to come to the positive conclusion that these men were sound. Then with regard to Mr. Hickson's statement that the opinion which he then formed had been confirmed, we had the present manager of the Bank of New Zealand and also the sub-manager called here. But of course they would not know anything at all about it, because it was not to either of these gentlemen that Mr. Hickson referred. Both of these gentlemen—Mr. Parfitt and Mr. Rigg—told us of the practice in such matters, and they said that no record was kept of such inquiries—that they were generally of a verbal kind, and that the inquiries must have been made through the Bank of New South Wales. They pointed out that it would be impossible for any one to say whether or not verbal inquiries had at that time been made. Then we had Mr. Wilson, at present a member of the Public Service Board, but who was at that time the manager of the Bank of New Zealand, which was the bank of this firm. Mr. Wilson, from his position, would be able to form a pretty good idea as to the standing of these men, who were his customers. I do not suppose it would be expected of a bank manager that he should be able to give absolute evidence as to the details of the property which he thinks his customers may have, but, as I have just said, one business man can easily form an impression of the financial standing of another business man with whom he is daily in contact. What did Mr. Wilson say? He did not know very much about Mr. Forrest, but with regard to Mr. Gillan he said:—

7295. Suppose the Bank of New South Wales had made inquiry of you as manager of the Bank of New Zealand, in March or April, 1895, as to the financial standing of Mr. Forrest, what would you have said? I could not have said much about Mr. Forrest, because I do not know as much about him as I do about Mr. Gillan.

7296. What would you have said supposing inquiry had been made of you concerning Mr. Gillan? I should have said that he was a thoroughly sound man financially.

Mr. Rigg, whose evidence appears upon page 197, says, with regard to Mr. Gillan:—

7262. But outside of that, and taking his repute for honesty and that sort of thing, how does he stand? I always looked upon him as what we should call a responsible and substantial man.

7263. And what have you to say concerning Mr. Forrest in the same relation? I happen to have known him for nearly twenty years. I think very highly of him. I knew him when he was a contractor in Dunedin.

7264. And how has his reputation stood? It has always been good as far as I know. I never heard of anything against him. I was going to add that I have not seen so much of Mr. Forrest here, but that I have had a good deal to do with him in New Zealand, when he was a member of the firm of M'Gill and Forrest.

There has been a good deal of evidence—in fact Mr. Parkes has sent down to New Zealand, and we have had a communication from the Land Tax Commissioner there—bearing upon the question of the means of one of these two bondsmen. I am not going into that part of the evidence, because it seems to me that so far as this department is concerned all that we have to satisfy your Honor about is that this matter was dealt with in an ordinary business-like and proper way, and that inquiries were made. What the exact nature of those inquiries were it is impossible to say at this stage. These inquiries must have led to information being given which justified the writing of these minutes; and in addition to that your Honor will remember that when these men came to sign the bond the officer in charge of bonds and contracts, Mr. Norrie, as it struck him that this was a transaction rather out of the ordinary course, took the extra precaution, whatever it may be worth, of taking a statutory declaration from each of them that they were worth £6,000, that being the amount of money for which they were each

each separately liable, so that, as far as the department was concerned, in addition to the inquiry that had been made by the heads of the department—the one the retiring head, and the other the incoming head—there was this further evidence, for what it may be worth, taken from each of the bondsmen when they came to the department to sign. Whether these declarations were absolutely true or not is a matter which I think it rests entirely with the contractors to explain. It is their business, and not ours, if the men have made a false declaration. I do not for one moment impute that, but it is for them to clear the matter up, if there be any doubt; and for that reason I submit that it is not at all necessary for me to go into the question of what was the property, whether real or personal, held by these individuals at the time they signed the bond. As to the other question, namely, whether they were fit and proper persons to take as bondsmen, seeing that they were connected with the firm who had entered into the contract itself, your Honor may remember that the contract was signed by Mr. Carter, Mr. Gummow, and Mr. Snodgrass. It is now alleged that the two sureties who signed the bond were partners in that contract with them. I submit that that again is a matter with which the department has nothing to do, and for this reason—the only three individuals the department knew in the matter were the three individuals who signed the tender, and who subsequently signed the contract itself. Whether the bondsmen, Mr. Forrest and Mr. Gillan, had an interest in this particular contract or not it would have been difficult to find out, and I do not think the department was in any way put upon inquiry as to what the exact relation between the bondsmen and the contractors was. That is a matter again upon which I think the contractors should satisfy your Honor. As far as I can understand the question, it seems to me to be pretty plain. At an early stage of this inquiry we had put in a document purporting to be a deed of partnership between these parties. There were several names—I forget now whose they were—to that deed. But if your Honor looks at it it will be clear to you at once what is the purport and effect of it. It is some time since I looked at it; but, speaking from memory, and subject to correction by Mr. Andrews, who will deal with this part of the case, it recited that this firm were about to go into a big contract in Adelaide for the Government of South Australia, in connection with which they joined in a deed which defined the various rights of the partners *inter se*. Furthermore, the deed was to comprise and to regulate the partnership with regard to any other contract the firm might take up, so that your Honor will see that it was an agreement of partnership with regard to one specific contract, and, further, an agreement defining the rights of the partners *inter se* as to any future contract they might among themselves agree to carry out, either in the colony of South Australia, in this Colony, or in any other part of the world. But, because two or three of the firm went into a contract here or there, that did not bring the contractors within the terms of that partnership deed unless there was at the time or subsequently a distinct agreement between the parties that that contract should be so considered. That, as I understand it, is the position of this so-called firm. It is not a firm in the ordinary sense of the term—namely, that all these individuals were a firm to carry on contracts and to divide the profits between them if there were any profits; but there was, as I say, a deed of partnership limited to one particular large matter at the time and to any further matter which might thereafter, by distinct agreement, be brought within the terms of the deed. That being so, it is not clear yet as to the particular time at which Mr. Forrest and Mr. Gillan became partners, if they are partners, in this particular Contract 77. Nor, to my mind, does it seem to be at all material. Mr. Carter, I think, told us that they came into this contract as partners shortly after the documents, viz., the bond and contract, were completed; but whether it was shortly afterwards or shortly before, to my mind, is absolutely immaterial; because it will be seen by your Honor that, as Mr. Chamier told us, it is a very common practice indeed when men lend their names as bondsmen for them to receive something in return. Men do not do these things for nothing—at least, business men do not. Unfortunately, some of us do so in outside matters; but business men do not do these things without expecting some sort of a return—a commission or something of that kind; and a very common way—in fact, the ordinary way—of giving a return to men who run the risk of putting their names to a bond, is to give them a share, a percentage in the profits of the concern, if it should turn out at a profit. The man who puts his name to a bond runs a risk, and he naturally says, “If you are going to make a profit, I shall expect a share of it.” That is a reasonable and business-like arrangement to make. Quite independently of the fact whether Mr. Carter, Mr. Gummow, and Mr. Snodgrass, had already signed this general deed of partnership, which gives the partners the right to come into any contract taken by any individual two or three of them—supposing that deed had never been in existence—supposing the men had never been together in any venture before—it would have been a reasonable arrangement if Mr. Carter, in approaching Mr. Forrest and Mr. Gillan, had said “If you will sign that bond, you can come in and share the profits as partners.” If that arrangement had been made, I submit that Mr. Carter, Mr. Forrest, and Mr. Gillan, would have been perfectly justified in making it. As far as the department is concerned, that matter has nothing whatever to do with it. All that the department had to do was to look at the matter in this way: “We have these three men signing this contract. It is a special contract. What is the character, and what is the position, of

these three men?" The department had to satisfy itself upon that point, and the other point they had to consider was, who were the two bondsmen. As I have shown, or attempted to show, inquiries made were sufficient to satisfy the two officers to whom I have referred as to their substantial position; but, with regard to their connection with the firm, all that was known to the department was that these men had been associated with the contractors in other ventures. They had no knowledge of the association in this particular venture; and I submit that that is not material—that it does not affect the conclusion to be arrived at. The department had these three names of persons who were primarily liable to the Crown if anything wrong happened, and it is absurd to contend—I do not know if it will be contended—that by taking the names of two persons who were partners in this venture the security was taken no further; because, although it is true, as a matter of law, that you can make secret partners liable on a contract when you discover them, that is a very different thing from getting a hold over a man from the fact that his name is put to a bond—a hold over him from the fact that he is a secret partner in a transaction in which others are mixed up. So that it seems to me that in taking these two names—even supposing the men were partners—there was a very substantial addition to the security given to the Crown for the due performance of the work. I submit, on all the facts of the case, that it is beyond the shadow of doubt that every precaution was taken by the department in seeing that the recommendation of the Board of Reference in their report, that this security should be taken, was given effect to. One point which was made by Mr. Parkes in his speech, was that a notice had appeared in the newspapers in connection with the dissolution of this partnership as regards two of the individuals who were connected with it, Mr. Maddison and Mr. Ewing, and that that notice of dissolution was dated 1st April, 1895, the contract and bonds being completed in May. But, although that notice of dissolution was dated on the 1st April, your Honor will see that Mr. Parkes states that the advertisement in connection with it did not appear until the 13th September—that, although the notice was signed, for some reason or other best known to the contractors—I daresay there was a good reason—the advertisement of the dissolution as regards these two individuals did not appear to the public until long after the contracts and bonds were signed—not that, to my mind, it affects the matter one iota whether the advertisement appeared before or after the signing of the contract, and for the reason, as I have already stated, that I do not think the department was bound to go into that matter. It was bound only to deal with the papers as they were submitted. I think that disposes altogether of Contract 77, with the exception of the charge preferred by Mr. Parkes with reference to the Parliamentary papers. I come now to Contract 79. The first charge under the heading of that contract is one which has already been dealt with under the charges relating to Mr. Hickson. It is—

With improperly granting to Messrs. Carter, Gummow, & Co. without re-tendering Contract 79, by which a loss was sustained by the Crown.

That I have already dealt with, and I need say nothing further in reference to it. The second charge, which is now withdrawn, had reference to the improper withdrawal of Bond and Hudson's tender. Upon that point I may mention that we have one of those highly interesting memoranda of Mr. Christie's, which tends to show that it was a very improper proceeding on the part of the Crown to allow these unfortunate men, who were kept on a string, as it is alleged, all the time, to withdraw their tender and get back their deposit. The memorandum to which I refer appears upon page 295 of the evidence, but since the charge is withdrawn I may leave that matter alone. The next charge is—

With allowing Messrs. Carter, Gummow, & Co. to manipulate the items in the schedule prepared by the department so as to increase the profits of the contractors to the loss of the Crown.

This charge, as it originally stood, was a charge of direct manipulation. Now the department is told that it did not manipulate the items, but that it allowed the contractors to do so. What is meant by that I am not quite sure, but I take it that the manipulation is that referred to in the memorandum by Mr. Christie, which is to be found upon page 297. Mr. Christie calls it "Memo. *re* the re-arrangement and substitution of schedule items, Contract 79." I suppose we may take it that that is the manipulation referred to—the re-arrangement and substitution of the items in this schedule, as pointed out by Mr. Christie. It is a long memo., your Honor, which sets forth the various minutes relating to this matter, and I do not propose to take up the time of the Commission by going through it. Mr. Christie concludes by saying—

From a perusal of the specification, and particularly of clauses 58 and 59, I cannot see that the contractors were in the first place entitled to the 2-in. margin.

I am very sorry we cannot satisfy Mr. Christie on the point, but I am sure your Honor will be satisfied in the matter if you will turn to Memo. No. 6, by Mr. Davis, which appears upon page 508 of the evidence, and also to his evidence upon page 276. The particular items referred to by Mr. Christie were those items with regard to guttering and gadding. I should mention that Mr. McCredie also made certain statements upon this point, which are to be found upon page 306. I was not here at the time, but I believe

believe a report was read by Mr. M'Credie. I understand that in answer to your Honor, on a subsequent occasion, as appears from the evidence on page 310, Mr. M'Credie admitted that he had made a mistake. He said:—

10396. *His Honor.*] Having looked at the papers, you think you must have made a mistake in assuming that the prices appearing upon page 339 of the Parliamentary papers were the office estimates for Contract 79? I was under the impression that they were.

10397. But, having looked at the papers, you conclude that there is possibly a mistake? Yes, possibly.

I need not refer further to Mr. M'Credie's evidence upon this point, but I will ask your Honor's attention to memo. No. 6 by Mr. Davis, upon page 508. Without going into the matter very fully, I may say that it is plain, beyond the shadow of a doubt, that Mr. Davis took the right course here. The result of his action was that out of the concrete for which these contractors were paid as much as £1,302 was knocked off in consequence of blasting having been substituted for the guttering and gadding. I think that is a fair statement of the effect of the evidence. I will call your Honor's attention to Mr. Davis' evidence upon page 276, where you will see that he gives a concise statement as to how the thing took place:—

9531. What took place? The contractors pointed out that if my recommendation were carried out the contract would not be completed under three times the contract time—that is to say, that it would take three times as long to drive a tunnel by means of guttering and gadding as by blasting. While they saw the force of what I had written from the departmental point of view, at the same time they wanted to get the concession of doing the excavation by means of blasting. To get over my difficulty they said they were prepared to allow for the concrete lining a sum equal to £1,250, which would mean the 2 inches referred to by Mr. Hickson; and that being so it was to our advantage to let the work be carried out by blasting, as we should have done under ordinary circumstances. In this case, however, as I point out in my minute, in consequence of the prices—that is the way in which the contractors had fixed their prices—I considered it my duty to call attention to the matter.

It will be seen that so far from the action of the department having increased the profits of the contractors to the loss of the Crown, the very opposite took place, and that the whole thing was dealt with in a proper and strictly business-like way. We come now to the third charge, which relates to the return of the retention money and of the deposit. The charge is in these words:—

With returning the cash security and the retention fund to the contractors, in violation of the contract agreement and to the advantage of the contractors, and hazarding the interests of the Crown.

First, with regard to the return of the cash security, which, I suppose, means the deposit. The amount of the deposit, I am told, in this case was £2,000, and the evidence clearly shows that it was not returned until the work was practically finished. Let me refer your Honor to Mr. Davis' evidence, on page 502. You will find there Mr. Davis' memorandum, No. 2, and under the heading of "fixed deposits, Contracts 79 and 79A," Mr. Davis says:—

In June, 1894, when the whole of the works comprised in Contract 79 had been practically finished, and there only remained the extension (Contract 79A) to be carried out, the question of the fixed deposit was brought forward for consideration. It was not thought necessary to retain £2,000, and the contractors were allowed to substitute another fixed deposit, for the sum of £650, for the works comprised in the extension. In addition to this, the sum of £531 10s. 6d. was held until the expiry of the maintenance period set out in the main contract.

Your Honor sees that that deposit, the return of which is said to have jeopardised the interests of the Crown, was not returned until the work was practically finished; and it was considered a fair thing, after all these matters had been dealt with—and these things must be considered if business is to be done at all—that these contractors should have back this money, so that they could make use of it. Then, with regard to the retention money, we have the evidence about the new conditions. Your Honor may remember that minute by Mr. Bruce Smith, suggesting the appointment of the Board of Reference. One of the first things to be dealt with by the Board was the new conditions, and one of the first matters involved in those new conditions was this very matter of the retention money. That minute (if I may say so, it is a very business-like minute) points out how necessary it is in dealing with these matters—I am speaking from memory—while being on the one hand very strict, and taking every care and precaution to guard the interests of the Crown, that is of the public, in these matters, to at the same time handle things of this kind so as to deal with contractors in a fair and business-like way, and, in proper cases, one might go so far as to say, in a liberal way: that is the only way in which business can be carried

carried on in a satisfactory manner to both parties. Mr. Bruce Smith was fully alive to that, and in his minute he suggests that a certain concession, if I might so term it, should be made to contractors with regard to this very matter of retention money. In accordance with that recommendation, as we know, the Board of Reference was constituted, and went to work at once upon the new general conditions. One of the first things they dealt with was this very question of the return of the retention money. The drawing up of the new conditions involved a vast amount of labour, because of the different sets of conditions in the different branches of the department. All of these had to be brought together, and the whole thing had to be focussed. The conditions, as I personally know, were revised again and again, until at last what was considered a fair and safe form had been arrived at. But that, of course, took a great deal of time, so that the new conditions were not finally approved until the 4th February, 1894; that is to say, it was not until that date that they received formal Ministerial sanction. The evidence, however, is abundant that before that date—long before that date—the heads of the department, each having a seat on the Board of Reference, and knowing that this question of the return of retention money was virtually settled, acted upon it in many cases. It was thought to be only a fair thing in dealing with contractors whose contracts were limited by the old set of conditions to deal with them upon the same lines as those upon which they would have been dealt with had the new conditions been actually passed and annexed to their contracts. That, your Honor, is the explanation of the action that was taken in this particular instance with regard to the return of the retention money upon Contract 79. It was considered fair to put these contractors upon the same footing as were the other contractors, and when they first made application I think there was only a small sum of £60 to be returned. Subsequently they got back a further sum of £200 odd. It was really putting them on the footing of 5 per cent. retention instead of a retention at the higher rate. They also had back the sum of £2,000, as I pointed out. This matter is dealt with by Mr. Davis upon page 501 of the evidence in his memorandum No. 2, under the heading of retention money. He says:—

With respect to the retention moneys on Contract No. 79, regarding which Mr. Christie gave evidence on 22nd July, 1896, the explanation is that 5 per cent. only was kept back, so as to preserve uniformity of practice, the new general conditions, providing that the maximum amount of retention money should be an amount equal to 5 per cent. on the amount of the tender, being at that time incorporated in the greater number of the contracts then being let. The contractors having, on the 28th December, 1893, represented that they would experience some difficulty in making satisfactory arrangements for the disposal of the Funded Stock, with which it was proposed to pay them for Contract No. 69, which was accepted on the 11th of that month, and having asked for assistance in the matter of making financial arrangements by the return of the retention money on Contract No. 79, amounting to £2,000, the Minister, in consideration of the contractors having shown their willingness to meet the department (with regard to the acceptance of payment for Contract 69 in Funded Stock), agreed to grant their request, and the £2,000 was accordingly returned to them. The work then remaining to be done on Contract No. 79 did not exceed £4,000, against which the department held the contractors' deposit of £2,000 for its completion.

Your Honor sees, therefore, that the reasons for the return of the retention money were of a purely business-like nature. These contractors were asked by the department to take a certain course with regard to Contract 69—to accept payment in Funded Stock—which the Government at that time were anxious to get off, not having ready cash with which to pay for these works. These contractors met the Government in a business-like way. They said, "If you wish us to do so we will take payment in respect of this contract in Funded Stock." When they entered upon the work it would be a matter of convenience to them to get back some of the cash deposit in the case of Contract 79, and the Minister, looking at the matter in a fair way, and seeing that there was only £4,000 worth of work to do, said "You met us very fairly in the other matter in connection with Contract 69. If it will be a convenience to you, I think it will be perfectly safe in the interests of the Crown to comply with your request in the case of this contract." That is the whole matter. The Minister at the time being Mr. Lyne, it seems to me that, if this is a charge which is made out in any way, it is one which affects, not so much the permanent officers, but the Minister of the day. It is a responsibility which, I think, as far as I know Mr. Lyne, who was then the Minister, he will accept. We then come to charge 4 under the heading of Contract 79—

With the discharging of Inspector Reid from the above contract for simply doing his duty in the interests of the Crown by insisting upon good work and material.

In the first place we know now, as a fact beyond dispute, that Inspector Reid was never discharged in the strict sense of the term—in fact, he rather resented the expression when it was used by Mr. Parkes, and said that he had never been discharged; but, as a matter of fact, he had been removed from this contract and put on to other work. That matter has been thoroughly thrashed out, and I will not weary the

Commission

Commission by going over the ground again. The sum and substance of it all is that there was very good ground indeed for the removal of this inspector. He may be, and probably is, a very good and strict officer, but your Honor can see from the evidence that there was a great amount of friction between him and the men, and friction between inspectors and men is a thing which is bad for all parties concerned—for the contractors and their men, as well as for the Government and their officers. Therefore it was that when matters came to such a pass as they did with Inspector Reid—perhaps through no fault of his own, except the fault of his temperament—he was removed. He is a fidgetty man apparently, and he worried the men, as it seemed, unnecessarily—perhaps in a too conscientious discharge of his duties. I do not for a moment pretend to say anything worse than that against him. At all events there was this friction, and those who were responsible for the control of these matters thought it advisable to remove him to some other job. He was removed, and his removal has been magnified into a charge that Inspector Reid being found much too strict a man it was thought to be a good thing to get him out of the way, so that there might be a more easy-going man on the spot. That is what is implied by the charge. The implication is that it was done in order that these contractors might get their work done in a slovenly manner. That is the only way in which I can understand it, as a charge, at all. Charge No. 5 is,—

With improperly paying an account of £350 6s. 6d. to the contractors for removing material, which work they never performed.

I do not think I need go into that charge further than to refer to the papers upon page 329 of the Parliamentary return. They are set out in full in Mr. Davis's evidence upon pages 505 and 506 of the printed evidence. The history of that little matter is shortly this—the department, under this contract, were bound to pay the contractors for the removal of certain stuff that was taken out. The contractors were able to make an arrangement, which was probably a profitable one, with the local council for its removal. The council paid for the carting, and Mr. Davis points out in the minute under date of the 17th August, 1894:—

I cannot see what power we have to call upon these men to repay the money to the council, even supposing it would be advisable to do so.

I do not think I need labour that portion of the case any further. Then there is another little matter which is made a separate charge by itself:—

With placing improperly to the account for payment on Contract 79 various items of payments for work done at Bondi.

The amount, I am told, is £11 1s. The matter is explained by Mr. Davis upon page 305 of the printed evidence. Charge No. 7 is,—

With advancing, without sufficient security, sums of money upon contract material not in the possession of the Crown.

That charge I will leave until I have dealt with the other contracts, because it is common to two or three, and I will deal with them all together in this respect. Coming now to Contract 69, the first charge is,—

With allowing Messrs. Carter, Gummow, & Co. to manipulate the departmental schedule for Sewerage Contract 69 so as to give the contractors an advantage over the Crown in their contract to build a sewer in Marrickville, by which the contractors were paid upon the extravagant items of charge, and were conceded those items upon which they had a losing price.

That charge involves the question of which we have heard so much—the question of the rigging of schedules. I think it is now made pretty plain to the Commission what this rigging is. It has apparently been a universal practice. Mr. Chamier, in his evidence, read us a paper, which will be found upon page 516, in which he showed that the practice is not unknown in other parts of the world, and that, so long as this system of tendering continued, so long would the practice prevail. I am not going into the ethics of the practice from a contractor's point of view. With that I have nothing to do. People may think, after all, that it is only a natural thing for contractors who take up speculative contracts of this kind, namely, in sewerage contracts, where there is so much underground work. The tenders must be to a great extent speculative, and, for my part, I am not one to blame the contractors for taking every advantage they possibly can—not an unfair advantage, but every advantage they can in preparing their tenders so as to save themselves—in order that if they lose upon one item they may pull themselves round on others. Mr. Chamier has shown that that is the way in which contractors go to work all the world over. His experience is that, on the whole, the system has not panned out so badly for the departments with whom the contracts have been made; and the evidence is also in favour of the contention that the department generally has not suffered from this system of rigging. With regard to this particular Contract 69, Mr. Davis, in his evidence, on page 497, has shown that this same rigging was carried out by every one of the tenderers—I forget now how many there were—for this contract. Your Honor will find

a table which shows the various amounts, and the way in which Mr. Davis substantiates his statement. The department are well aware that in a contract of this kind such a course of procedure would be very likely to be adopted by tenderers in preparing their schedules; but, in this particular tender of Messrs. Carter, Gummow, & Co., there is no doubt one item which is a most extravagant one—and a great deal has been made out of it—I mean the item of bluestone pitchers at £50 a yard. There is no doubt also about this—that the department made a mistake. Their plan unfortunately did not agree with their schedule, and the contractors were cute enough to perceive this, the consequence being that they lumped the price on to this item, knowing that more of it would be required than appeared from the schedule. They had only to look at the plan to see that from necessity that must be the case. They therefore put in this big price of £50 a yard, which, we are told, is an absolutely monstrous price. For some time attention was not drawn to this matter at all. Mr. Hickson says that the first time he heard of it was a long time afterwards—that, as a matter of fact, it was not mentioned at the Tender Board. Mr. Bagge reported upon these tenders, and the matter evidently escaped him; at all events he did not report upon it, and presumably had he reported upon it at all he would have done so by way of a minute, a report of such a nature being always made in that way of necessity, and not, as Mr. Parkes supposed, by an officer running down to his Chief's room and saying "Look at this item." That is not the way in which they do business in the Public Works Department. The officers write proper minutes directing attention to any matter to which, in their opinion, attention should be called. It is clear that Mr. Bagge did not call attention to this item. The tenders were accepted and the contract was signed with this item of £50 in it, and this discrepancy between the plan and the schedule. A copy of the schedule, as is usual, was sent out to the Resident Engineer to work upon, and, unfortunately, a clerical error was made in the copy which went out to him, the item appearing as 50s. instead of £50 in that copy; so that it was not until a very late stage, when the work was far advanced, and when the contractors were getting down to this particular item, that the mistake was, for the first time, discovered. It was then discovered that the contractors had this large price of £50 against this item, and, further, that a great deal more of the work would be required than was set down in the probable estimate of the department. It is clear, I think, that the contractors here had got the best of it. There is no get away from that. The contract was signed, and it had to be carried out. If the department had made a mistake, it was bound by it. That was the view which Mr. Hickson took. He said, "This is the plan; we cannot get away from that; the plan is part of the contract; we must pay the contractors at their price for the amount of work required, according to the plan, but I will not authorise it beyond that." That substantially was the course taken, and accordingly the contractors were paid. It has been argued, first of all, that Mr. Hickson was wrong in that view, because under certain clauses of the conditions—clauses 16 and 17—he had the right to strike this work out, and to substitute other work. I do not think, however, that that is a matter for argument at all. I do not think there can be any idea that these conditions applied to a case like this. Mr. Chamier spoke very strongly upon the point when his attention was drawn to it. It does not, however, require an expert to tell us that the clauses to which I have referred do not apply to such a case, and that it would have been an abuse of the power conferred by the clauses to attempt to enforce them for the purpose of setting right the department's own mistake. I submit, therefore, that Mr. Hickson was perfectly right, and his opinion is confirmed by the evidence of Mr. Chamier, who said he would have taken exactly the same action in the matter. Another consideration to which it is worth while to refer is this—assuming that this monstrous item had been pointed out to the Tender Board at the time the tenders were being considered—what would have been the action of the Board in reference to it? Could the Board have thrown out the tender by reason of this extravagant charge? I submit that, on the evidence, it is clear that that course would be impossible, because, as Mr. Chamier very fully pointed out, if you once begin throwing out tenders for that sort of thing where can the line be drawn? It would be absolutely impossible to draw a line, and it would let in all sorts of suspicions of favouritism in this direction and that direction. Mr. Chamier was perfectly clear upon the point, and I submit that his opinion commends itself to every impartial mind that it would be impossible, in view of the general prevalence of this practice of rigging, for any department to take upon itself the responsibility of throwing out the tender merely on the ground of extravagantly priced items in it. Mr. Hickson was also asked some questions upon this point and his answers were to the same effect—that even if his attention had been drawn to the matter he could not have thrown out this particular tender. The only course he could have taken, he said, would have been to throw out all the tenders, to accept none, and to call for fresh tenders. There is a difficulty in taking a course of that kind for the simple reason that it is impossible to see where the thing would be likely to end. As I pointed out, it would be absurd to expect that any tenders coming in for work of this kind would not be open, to a greater or less extent, to a charge of rigging. That, as I understand it, is the whole position of the matter; and I contend, therefore, that Mr. Hickson's action in this particular case was the right and proper one to take—in fact the only one. I should like to draw attention to the way in which



which Mr. Hickson has dealt with this very matter generally. For a long time before this he had been exercised in his mind as to the practice which prevailed of rigging schedules ; and he had been considering how he could best obviate the evils which arose from it. He came to the conclusion that the only way to do so would be to introduce the new system of tendering, which he explained to your Honor in his evidence at a very early stage of the proceedings, when your Honor questioned him upon the matter. I need not refer to what that new system is, because it is already well known to the Commission. There was some question affecting the subducts which has been already fully explained. I do not know that there are any other items to which I need specially refer. I take it that the question of the bluestone pitchers was the main question upon which this charge was based. It is obvious that a mistake was made in the plan and schedule and in the copy of the schedule which went out to the resident engineer, and I am sure that your Honor will not impute to any officer of the department any intention of making a mistake of that kind with the object of giving these contractors any advantage. The idea, I submit, is too absurd to be entertained for one moment. There is no evidence whatever that that was the case. It was evidently a mistake ; and these mistakes will happen, especially in a large department such as this, which has to deal with such a vast number of contracts of all natures and sizes. I will proceed now to deal with the next charge.

With allowing the contract to be taken up by Carter, Gummow, & Co. with an insufficient bond, and with ultimately breaking that bond by remitting the retention money and writing a minute by which the Minister was deceived and induced to consent.

The bond, in this case, was signed by Mr. Henty and Mr. Scrutton. Some stress was laid upon the fact that these contractors were not bound to make a cash deposit. The reason for that has been explained. They were allowed to substitute personal security for cash, because they had agreed to accept payment on the contract in funded stock. Here is another of those arrangements which I submit are well within the powers and functions of the Minister, acting with his responsible officers under him, if he thought it was a proper and business-like arrangement to make. Such an arrangement was made. The bond was taken for double the amount, and I do not know what objection can be taken to the names of the two bondsmen. So far as the charge relates to the insufficiency of the bond, the evidence is all the other way—that the bond was a sufficient and proper one, such as is usually taken in such cases. Then with regard to the other part of the charge: “With ultimately breaking the bond by remitting the retention money, and writing a minute by which the Minister was deceived and induced to consent,” that minute in which we are charged with deceiving the Minister must be the minute which appears upon page 127 of the printed papers. It is written by Mr. Davis, and is under date the 21st September. As far as I can see, if there is any charge of deception in connection with that minute, it lies in the fact—upon which some little stress has been laid by Mr. Parkes in the course of his examination of witnesses—that Mr. Davis refers to one of the bondsmen, Mr. Henty, as the firm of Henty & Co., a firm which, I suppose, may be regarded as perfectly safe. It is too trivial a matter to discuss seriously—that, because Mr. Davis, in mentioning the names of the bondsmen, happened to refer to one of them by his firm’s name, when, in reality, the Crown only held as a bondsman the individual who happened to be a member of the firm ; there was deception. I will not say another word about that. It is too frivolous a matter. Then as to charge No. 4. That is another case of advance upon material with which I will deal in connection with the similar charge under the heading of other contracts. As to charge No. 3 :—

With paying to the contractors large sums of money which they (the departmental officers) were not compelled to pay under Carter, Gummow, & Co.’s contract with the Crown.

I must leave it to Mr. Parkes to point out from the evidence what these large sums of money are, because, at present, I do not quite know what it is we have to answer, and what these large sums of money which we are charged with paying to the contractors, but which we were not compelled to pay, can be. Then, in regard to charge 5 :—

With incompetency in carrying out and administering the contract.

That is one of those charges which are so vast and so vague that I do not quite know how to deal with it. At present, as far as I can see, there is no direct evidence in support of it. Perhaps Mr. Parkes will be able to call your Honor’s attention to evidence which shows that there has been incompetency on the part of the department in the carrying out of this work ; but as some slight evidence in the opposite direction I refer your Honor to papers—I am not quite sure whether they are in evidence or not, and if not I will ask if there be any necessity that they should go in evidence—upon pages 121 to 124 of the printed papers, commencing at paper No. 7 and continuing to paper No. 14 inclusive. Your Honor will there see an illustration of the care and foresight which was adopted by the officers of this department in the administration of this contract. It will be seen that the question arose as to the method of constructing

constructing the sewer and so on, wholly in concrete, or in brick and concrete. Mr. Davis wrote a minute, which your Honor will find upon page 121 of the Parliamentary papers, under date of the 18th January, 1894, in which he says:—

With a view of ascertaining which would be the cheaper method to adopt, I have had comparative estimates prepared at the contract schedule rates, which I attach.

Your Honor will see from the papers which follow how he deals with the whole matter, and how carefully the whole thing is gone into. Mr. Davis makes certain recommendations, and the whole thing is thoroughly thrashed out to find out what will be the cheapest way of doing this work for the country.

*His Honor*: I do not know whether these papers have actually been put in so as to form an appendix. They have been referred to more or less indirectly, and, perhaps, some of them have been put in; but, if you wish them all to go in as an appendix, Mr. Smith, I think it is quite fair that that should be done, because the papers are quite as much public property as are any other of the documents which have been put in.

*Mr. Smith*: I should like the papers to go in as an appendix, your Honor, inasmuch as they show the care which the officers of the department exercised in seeing that the work was carried out to the best advantage of the country. As a matter of fact, Mr. Davis did refer to the papers in his evidence.

*His Honor*: The whole of these papers might have been put in holus bolus, and perhaps that would have been the simplest way of dealing with the matter, had it not been for one great difficulty which is not at first obvious, and that is, the difficulty of afterwards making up the report. It is also a question of expense to some extent.

*Mr. Smith*: There is another matter which I submit shows what care was exercised, and that is, the saving made upon this contract by the substitution of one sewer for two. That is referred to by Mr. Davis in his evidence upon page 395, and it is also referred to by Mr. Hickson. The saving up to a certain date amounted to £1,100, and, as Mr. Davis pointed out, there was a prospective saving of some £9,500 more. I submit that there is no evidence at all to show that there was any incompetency, but that, whatever evidence there is, is all the other way, it appearing that every care has been exercised. I come now to Contract 79A, which, as your Honor knows, is the extension of the North Shore Contract 79. In connection with that contract we are charged,—

With inducing the Minister, on the plea of urgency, to let the above Contract 79A to Carter Gummow, & Co. without tender, and upon the departmental estimate, by which a loss is liable to be sustained by the Crown.

This is one of those extraordinary charges, which I confess I cannot understand, in the face of the evidence, and of the facts set before Mr. Parkes before there was any thought of the granting of this Commission. Mr. Parkes then had before him so plain a statement of the matter that I really cannot understand how such a charge can have been put forward at all in the first instance; and, Mr. Parkes having heard the evidence, it is still more incredible that such a charge should have been persisted in in the amended charge-sheet of 4th September. I will deal with the charge as shortly as I can, and perhaps I cannot do better than read to your Honor a portion of a speech made by Mr. Lyne, in the Legislative Assembly, on the 26th September. I think when your Honor compares that speech with the evidence given by Mr. Lyne, here you will see, not only that Mr. Lyne is responsible for the granting of the contract, and that he himself accepts that responsibility, but, further, that that fact was clearly pointed out to Mr. Parkes at the time he made his charges in the House on 26th September. When Mr. Parkes was examined here I asked him about this speech of Mr. Lyne. He told the Commission that he did not hear the speech—that he was not in the House at the time. He gave that evidence just before the adjournment of the Commission, and on the following day I pressed him upon this very matter, as to whether he was or was not in the House at the time Mr. Lyne made this speech. I referred him to the report of the speech in *Hansard*, page 1209, of the Session of 1895, from which it clearly appears that Mr. Varney Parkes interjected during the course of Mr. Lyne's speech a remark with regard to another matter. I drew Mr. Parkes's attention to this, and then Mr. Parkes told us that although he was evidently in the House at the time when Mr. Lyne was referring to the Johnstone's Bay matter, he was not there when this particular matter of the North Shore extension was dealt with by Mr. Lyne. Mr. Parkes was pressed upon the point again, and when his attention was drawn to it, he said, in reply to Question 15171:—

There is no doubt I was there during the first portion of his speech.

On being asked whether he was not there when Mr. Lyne referred to Contract 79A, he said,—

I do not think so. If I was, I did not hear him.

It is almost incredible, I submit, that a man in Mr. Parkes's position—taking the responsibility of making these charges—should come here and say that he was not in the House when Mr. Lyne was dealing with  
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this very important matter. Mr. Parkes had just charged Mr. Hickson, by reason of his son's being a partner in the firm of Carter, Gummow, & Co., with giving this extension of Contract 79A to the firm, and when the Minister who gave the extension deals with the matter Mr. Parkes either was not in the House or, if he was there, he said he did not hear Mr. Lyne's speech. What does Mr. Lyne, himself, say with reference to this matter? At the bottom of the second column of page 1207, in *Hansard*, of the session of 1895, Mr. Lyne said:—

I shall deal only with the contracts at North Sydney. The honorable member for Canterbury said that £35,000 worth of work had been given to Carter & Co., at North Sydney, without tender, and he also referred to a contract involving £12,000 or £13,000. This is the only contract of which I know anything. As far as my memory serves me, Carter, having had the main contract, was carrying it out remarkably well, when an application was made by the honorable member for St. Leonards for an extension of the work, because of the number of unemployed to which it would give employment if it were carried out without the delay which would be caused by calling for fresh tenders and requiring new contractors to obtain new plant. The contractors required £16,000 or £17,000 for the work; but the Engineer-in-Chief reported that the Departmental estimate was, I think, some £2,000 or £3,000 less than the schedule rates. I then had an interview with the honorable member for St. Leonards, and, I think, with Mr. Carter, though I should not know that gentleman by sight now, the outcome of which was that the firm agreed to take the work at the Departmental estimate. In a case of this kind, when the Minister has a good man as a contractor and sees that needed employment can be given by extending his contract, he is entitled to use his power to extend the contract. There are contractors and contractors. There are contractors who do their work for the Department well, while there are other contractors whom, because of their past work, I would not allow to have another contract if I could prevent it. Speaking with an experience of a good many years, I would say that it is cheaper to let men who do their work well have contracts than to give these contracts to men who have no capital, who slum their work, and who are constantly a serious loss and drag upon the Department. If I remember rightly, on that occasion—I should state in fairness to the Engineer-in-Chief for Public Works—I do not think that he advised me to do this work. I think that his advice to me was in accordance with the minute which has been read to-night; and that was, if anything, against doing the work in this way. But I considered that I was justified in the course I took, and I therefore took it. I am responsible for it, and I am satisfied that the work is well done.

It would be impossible to have clearer evidence than we have in that statement as to who is responsible for granting this extension to Carter & Co. Your Honor may remember that, when Mr. Lyne was called here to give evidence on another matter, he, at the close of his evidence, referred to this very contract. In reply to question 9224, he said—

9224. You did not know of the existence of this paper? No; I did not. There is one matter to which I should like to refer. I have seen in the newspapers some reference to the extension of the North Shore Contract. That is a matter which applies to myself as well as Mr. Hickson. Carter & Co. were carrying out the North Shore Contract, and, when they had about finished the work, there was an extension to be done. At that particular time there was a good deal of distress about. The men who were employed upon the contract were likely to be turned adrift, and the question arose as to whether we should invite fresh tenders for the extension or not. I think that was the only time I ever saw Mr. Carter, or some other gentleman, whoever it may have been, connected with the firm. I inquired what the cost of the extension of the sewer would be, and I think they wanted £16,000 or £17,000. The Departmental estimate was about £12,000 or a little over, but they would not, for some time, take the lower sum, and I spoke to Mr. Hickson about it. He was certainly in favour of inviting fresh tenders, which I should have done had they not eventually taken the contract at the Departmental price. I think I did, in my minute, write that there was to be no claim of any kind for extras. I am not quite sure about it, but I think I made some minute of that kind. Even after I had practically made up my mind to do this, Mr. Hickson suggested that fresh tenders should be called; but I wished to get the work on as quickly as possible. Besides, Carter & Co. had a good record in the office. I looked upon them as one of the best firms of contractors we had for that class of work, and I decided to accept their tender at the Departmental estimate. What I wanted to say, however, is that Mr. Hickson never influenced me in the slightest degree to do what I did. The course I took was rather in opposition to the course which Mr. Hickson desired me to take. I knew all the circumstances in connection with the case, and I am quite prepared to take the responsibility for what I did.

That is Mr. Lyne's account of the matter given on two separate occasions, once in his place in the House, and once when he was here as a witness, and his statements are made, as your Honor sees, entirely from memory and without having the minute before him; but I should like to refer to the minute because, as I submit, and as I tried to get Mr. Parkes to see in his examination, it is clear beyond question from the minute itself that this was the true explanation of the affair. Upon page 335 of the Parliamentary return there is this minute by Mr. Hickson, of the 22nd of March, 1894:—

There is no reason why this extension should not be gone on with at once. I cannot, however, see my way to recommend that it be carried out as an extension of the existing contract, which, at schedule rates, would amount to £16,307 17s. 8d., whereas the office estimate is £12,831 19s. 6d. The greater part of this difference lies in one item, "Excavation in shafts," which, in present contract, owing to their great depth, carries a very high price, viz., 78s. per cubic yard. This Messrs. Carter & Co. are prepared to reduce to 40s. per cubic yard, which would reduce the total cost to £13,700, or about £1,000 above the office estimate. I believe, however, if tenders were invited we could get the work done under the office estimate.—R.H., 22/3/94.

That was submitted, and we then have a further minute. Mr. Lyne has explained what took place from memory, and I submit that that clearly agrees with the minute here. Mr. Hickson was inclined to recommend the calling of fresh tenders, as Mr. Lyne informed the House, and also informed your Honor. Mr. Lyne then had evidently seen the contractors, and they were willing, it appeared, to make a further reduction and to come down to the office estimate. Mr. Lyne says that as the contractors were willing to come down to the office estimate he determined to let them have the contract, because he wanted the work done at once. The contractors had all the necessary plant, and the work, it was pointed out, would give the unemployed employment. Thereupon the matter was sent to Mr. Hickson, and your Honor will see that that is the way in which he came to write his minute of 29th March, 1894:—

Referring to the Minister's intimation this morning, that he was prepared to let Messrs. Carter & Co. carry out this work as an extension of their present contract, provided they agreed to do so for the departmental estimate of £12,831 19s. 6d., no claims whatsoever to be made for extras, and all payments to be made at the allowed schedule rates, I have had an interview with Mr. Carter, who is prepared, on the part of his firm, to comply with the Minister's decision. Submitted for formal approval.—R.H., 29/3/94.

It is as clear as the noonday sun that the Minister gave a direct intimation to his officer that he had made up his mind—that he had come to a certain decision—and that, in spite of Mr. Hickson's recommendation as to fresh tenders, being called, the Minister's decision was to give the contract to these contractors for certain reasons which seemed to him to be perfectly sound and good ones. Mr. Lyne took the responsibility for what was done, and he still stands to it. Mr. Parkes was asked about that minute, and his attention was drawn to these very words, which to my mind, and to everyone else's mind, show that there was a clear intimation from the Minister. He was asked, at Question 15186—

15186. So that he clearly refers there to an intimation which he had had from the Minister? Yes; but I should have thought that he would have protested if he knew that the work could be got cheaper than the office estimate.

And then again, at Question 15193, he gives the following evidence:—

15193. Then Mr. Hickson goes on to say:—"I had an interview with Mr. Carter, who is prepared on the part of his firm to comply with the Minister's decision"—is that not so? Yes.

15194. So you see that the minute itself says that that was the Minister's decision which Mr. Hickson was instructed to communicate to these contractors—is that not plain? Yes, it looks to be so.

15195. That being the concession, how do you charge Mr. Hickson with a sudden change as you do in the next line? It is a sudden change, comparing these two minutes together. One cannot comprehend a man who writes a minute so positively as that first minute being so weak as to give away his position by writing the other, if they were sincere minutes; and they appeared to me not to be sincere minutes.

That is Mr. Parkes' explanation when his attention is drawn to this particular minute, which, as I contend, speaks for itself. Your Honor sees that he does not there complain—he could not dare complain in view of that document—that Mr. Hickson had induced, as his charge states, the Minister to give this contract to this firm of contractors. All that he complains of, when he is confronted with the minute, is that Mr. Hickson did not protest against the Minister's doing it, which is another thing altogether. This evidence was given before your Honor on the 31st August, so that Mr. Parkes' attention was drawn to this particular matter in a marked and pointed way some time ago. Still, in spite of that,

that, on the 4th September he hands in a new list of charges, persisting in this particular charge, which he made in the House on 26th September, 1895, and which was contradicted and explained conclusively there by Mr. Lyne on that date, that gentleman having also further explained it away by his evidence here. The minute itself has been pointed out here to Mr. Parkes. Still, in spite of that, he leaves before your Honor this charge, which it is apparent is absolutely without foundation of any kind. That, I contend, is another illustration of the absolute want of care and caution which has been observed in the preferring of these charges. There was a little matter arising under Contract 118 which is comprised in the second charge under that contract—

With allowing the contractors to have the benefit of labour performed by unemployed paid by the Crown to drain the works of the contractors, which drainage the contractors have to take the responsibility of under their agreement with the Crown.

I do not think it is necessary to go into that question at any length, but I would refer your Honor to the evidence of Mr. Davis upon pages 507 and 508.

*His Honor*: I should think that that charge could be no longer pressed—I should imagine not. Perhaps it is. If it is, you had better address yourself to it, Mr. Smith.

*Mr. Parkes*: I no longer press that charge, your Honor.

*Mr. Smith*: Then the next matter to which I have to refer is as to certain charges with regard to advances on material. These charges refer to three of the contracts—79, 79A, and 69. I would merely say this with regard to these charges—that this practice of advancing to contractors, in proper cases, on the security of material and plant has been shown to your Honor to be universal. This particular firm of contractors was not dealt with in any other way than were other contractors. The Government, when they see their way, always make these advances to contractors. Mr. Hickson referred to it in his evidence on page 576. He there referred to the reasonableness of the particular advances made in each one of these cases. I will do no more than refer your Honor to Mr. Davis' memorandum No. 3 upon page 502. In addition to that, I would point out that there is a clause in the contract itself, as your Honor is well aware—I think your Honor drew attention to it—under which all of the material and plant which comes on to the site of the contract becomes the property of Her Majesty, as soon as it is placed there, in virtue of the terms of the contract. In order to get over any question as to this plant and material being removed from off the site, in cases where it might be difficult to establish a hold over it, it has become the practice, and it was done in each one of these three cases, to take by way of further security at the time of advance a distinct memorandum which gives a charge over the plant and material wherever it may be. The contractors give this charge, and, under it, the Government have a right to follow the plant and material wherever it is. I know, as a matter of fact, that the question came up some time ago, and that this memorandum was framed and settled in the Crown Law Department to get rid of the objection that, although we had a hold over the material which was on the site, if it had been removed we might not be able to get it. When, therefore, these advances are made this particular form of memorandum is taken to get rid of that difficulty. With regard to defective work, there is a bunch of charges relating to it upon Contracts 69, 79A, 118, and the Glebe contract. As to Contract 69, the only evidence I am aware of is that of Benson, as to a certain short pipe. That, I think, has been explained by Mr. Griffiths and by Mr. Husband. Then we had the evidence of Darcus as to a certain syphon being out of line or something of that kind. That Mr. Griffiths has also explained. As to No. 79A, we have the evidence—the remarkable evidence—of Dawson, the workman who did this fraudulent work, as he himself admitted, knowingly. He did it behind the backs of the inspectors, as he admitted, so that it really does not concern the department a bit. Perhaps it is hardly necessary for me, as representing the department, to refer to this bit of bad work at all, because it was done behind the department's back, and, as your Honor knows, it would be absolutely impossible in underground work of this sort, if a man with fraudulent motives intends to do defective work, to stop him. It is impossible to check a man if he has made up his mind to do dishonest work in a case of this kind. You could not do so unless you had an inspector standing over every man during every working hour. The only remarkable feature of this evidence of Dawson's is this: that this work was done at the end of the year—in December—or after Mr. Parkes had made his first speech in the House preferring these charges. I think there is evidence showing that Dawson on several occasions—Mr. Andrews will probably refer to the matter—stated that if he did not get a certain thing he was going to make it hot for the contractors, or something of that kind, and that he would go and see one Varney Parkes, whoever he might be. This work was done deliberately by this man, who was cute enough to see that, in view of the statements made by Mr. Parkes in the House, if he went to him, it would be a lever to use in working the contractors. That, I submit, is a pretty good illustration of the misfortune which is found to arise if statements are made in the House on such matters on so little foundation. However, these statements have been made, and they have, I submit,

submit, been shown to have been made without foundation. In consequence of them it almost appears as if this man deliberately did this piece of bad work. The only other piece of alleged defective work is upon Contract 118, in reference to which there is some slight evidence as to some soft sandstone which is supposed to have gone into the work. As to the Glebe contract, there is evidence to the effect that some shale was flung down a shaft. That was the evidence of Caughey. I do not think there is any other charge in connection with defective work to which it is necessary that I should refer. I do not think I need labour the case as regards the charge as to withholding the papers from Parliament. As to the papers in connection with Contract 72, I think the allegation can be answered in one sentence, viz., that the papers in regard to that contract were never ordered to be printed by the House. The terms of the order speak for themselves, and there is no reference whatever to that particular contract. Mr. Christie has prepared another very elaborate memorandum, or minute, or whatever it may be called, from which one would come to the conclusion that these papers had been knowingly withheld. Mr. Christie refers to certain papers in that connection, and I submit, with the most absolute confidence, that your Honor will come to a totally opposite conclusion as to that—that, instead of the papers in connection with Contract 72 being required to be printed, they were not required at all. The reason why Mr. Barling thought it necessary to print the contract and the final voucher was, as he himself explained on page 439, that inasmuch as there was in Contract 79 a recital of the settlement of the claim with regard to 72, he thought it better to put in certain papers to show what was done. I may mention that the officers who were responsible for this return—Mr. Barling, who cannot be expected to go into detail, Mr. Davis, who was charged with the collection of the papers, and Mr. Hungerford—have all been examined before your Honor; and I think the conclusion is irresistible that no attempt was made to keep back anything which ought to have been printed. As to Contract 69, Mr. Christie again sets out in a memorandum upon page 380 the material documents which he thinks ought to have been printed. Upon this point Mr. Davis has given an explanation, which is to be found upon page 503. The explanation is a very simple one, and is perfectly plain and satisfactory. As to Contract 79A, Mr. Christie has written a memorandum, which is printed on page 452. That memorandum, I confess, had escaped me. I was not here when it was read, and, in going through the evidence, and seeing what it was that we had to meet, I missed that little document, so that we have tendered no evidence in regard to it. If your Honor, however, will just look at the memorandum itself, and will see what the papers are, I think you will conclude that there is no serious charge involved there. Of course, if your Honor should think it necessary, I will ask leave to call Mr. Davis now. Personally, I do not think it is necessary. Your Honor will see from the nature of the documents that they were documents of not very great importance, and no doubt the explanation is that they were in circulation, and that they were not with the records at the time Mr. Davis and Mr. Hungerford were going through them. With those few words I will leave that charge as to the withholding of papers from Parliament. We have the evidence of the officers concerned that every care was taken which could be taken in preparing the papers. The last matter I have to refer to—I have covered all the charges, with the exception of this charge, which was added quite recently—is a charge which seems to me to have been put in with the object of helping out the charge of defective work, which has so lamentably broken down—I mean the charge with regard to the shortage of cement. That charge was preferred after the new list of September 4th was put in. It was made on September 9th, and is to the following effect:—

With allowing faulty supervision of the contracts carried out by Messrs. Carter, Gummow, & Co., by which inferior concrete was supplied, making defective work, there not being the specified quantity of cement used, more particularly in Contracts 79, 79A, and 69.

It will be seen that this is a general charge, first of all of faulty supervision on our part by which these contractors have been able to get off with the use of a less quantity of cement, and that therefore we have an inferior sort of concrete to that which should have been put in under the contract; and, secondly, that that faulty supervision extends to all the contracts of Carter, Gummow, & Co., but in particular to the three contracts named—the two at North Shore, 79 and 79A, and the Marrickville contract, No. 69. First of all, if I may say so, there is absolutely no evidence before your Honor of faulty supervision on our part. The evidence, in fact, is all the other way. Mr. Davis gave some evidence as to the nature of the supervision exercised, and the way in which the returns were made by the inspectors. The department have put in, through Mr. Davis, a list of the engineers, resident engineers, and inspectors who supervised these three particular contracts named by Mr. Parkes in his charge. Some of these engineers and inspectors have been called here as witnesses, and if this charge had been before your Honor on the various dates upon which they were called opportunity might have been taken, if it were necessary, to elicit from them information as to the nature of the supervision they gave; but the charge came in afterwards, and I have not thought it necessary—I have taken the responsibility of that upon myself—to have these various engineers and inspectors called, because, as I submit, there is absolutely no evidence that

that there has been any faulty supervision. That being so, the question arises,—Upon what evidence is this charge based? It rests upon what Mr. M'Credie and Mr. Thompson told us, and upon certain memoranda written by Mr. Christie. With regard to Mr. M'Credie, your Honor will remember that he made certain tests, and that from those tests he came to the conclusion that for every cask of cement used we ought to get 20 cubic feet of sandstone concrete, and in the case of bluestone concrete 16 cubic feet, and no more. That, I believe, was supported by Mr. Thompson. Then Mr. Christie has been at infinite pains in searching the books, in connection with these contracts, for a great number of years, to find out the number of casks of cement purchased here, there, and everywhere. He has also been at infinite pains in making a calculation based upon Mr. M'Credie's tests, showing that there is a considerable shortage in the cement used. I submit that these tests of Mr. M'Credie, upon which the whole of this evidence is based, are absolutely unreliable. I submit that the evidence which we have here, which is opposed to them, is so conclusive that your Honor will not accept any arguments, founded upon tests of that kind, as having any particular weight. Mr. Davis has gone very carefully into the matter, and he speaks, not from similar tests made at the time, but from experience founded on the quantity of cement used upon contracts involving concrete. We have the evidence of certain contractors, who were called by Carter, Gummow, & Co. We have also the evidence of Mr. Griffiths, whom your Honor had before you on several occasions, and whom I think your Honor will regard as a capable officer and as a witness to be relied upon. The evidence which has been given by the witnesses to whom I have referred amounts to this—that, instead of the quantities of concrete being 20 feet and 16 cubic feet, it is nearer the mark to say that they are 27 and 22 cubic feet. Taking that as the more correct basis—according to the evidence it is the correct basis—Mr. Davis has prepared a memorandum, which is to be found upon page 631. In that memorandum he has dealt with the quantities of cement which should be used upon these contracts—79, 79A, and 69. This calculation he has made on the basis of 27 feet and 22 feet, and he has also taken the inspectors' returns, and those are tabulated, as your Honor will see, in connection with the three contracts. The total quantity used, according to Mr. Davis, should have been 15,606 casks, whereas the actual quantity appearing from the inspectors' returns to have been used is 15,619 casks. Mr. Davis is careful to point out that these returns cannot be relied upon absolutely, but he thinks they would be within about 5 per cent. of the quantity actually used. Then, inasmuch as Mr. Parkes's charge referred not only to these three contracts but to all the contracts of this firm of contractors, it was thought desirable to place before your Honor a statement of the quantity of cement which should have been used upon these contracts since the 1st of January, 1892, based, of course, on the previous data. That calculation appears upon page 632, and it shows the various contracts for that period. [It is shown that the total quantity of casks which should have been used on all these contracts amounted to 44,740, and that the inspectors' returns, so far as they are available, show the total quantity used upon the contracts to have been during the same length of time 44,630 casks. It will be seen that the calculations made by Mr. Davis agree substantially with the quantity shown by the inspectors' returns. There was some evidence, I believe, with regard to the amount of cement which these contractors had actually purchased during this time, and an infinite amount of trouble and pains has been taken by Mr. Christie in investigating this highly interesting matter. Certain evidence, as I say, has been given upon this point. What that evidence is, it is not for me to say. It does not concern the department in any way. It is a matter which concerns the contractors alone. All that I am concerned to do is to submit to your Honor that, on the evidence, it is clear, from our point of view, that there has been no faulty supervision of these contracts, and that, so far as we have been able to discover, there has been no deficiency of cement. I think that completes the whole of the remarks I intend to make upon these charges. But there is one matter to which I ought to address myself. I refer to three questions which have arisen in the course of this inquiry which are not involved in the charges, and which concern the action of three of the officers of the Department of Public Works. Perhaps your Honor will allow me to refer shortly to this question of the money transactions between these officers and Mr. Carter. There have been three instances. One was an advance of money by an officer to Mr. Carter, and in the other two cases there was an advance to the officer by Mr. Carter himself. The first case is that of Mr. Weedon, the engineer. In reference to that matter Mr. Carter was first of all examined, and he told the story very clearly upon page 210 of the evidence—how Mr. Weedon, having this money to invest, consulted Mr. Carter about it, the money being finally lent to Mr. Carter upon certain security which Mr. Carter gave him. The money was lent to Mr. Carter, and to Mr. Carter only, it having nothing to do with the firm's business. Mr. Christie has here been at work again, and the result of what must have been very trying and arduous labour is the memorandum which is to be found upon page 231, headed "Memo. *re* financial dealings of Messrs. Carter, Gummow, & Co. with Mr. S. H. Weedon, Government Resident Engineer, Sewerage Construction Department, and as to payments of interest." As Mr. Christie stated here, from his examination of the books and from what had been done with the cheques, which he appears to have traced all through, and from the then position of the firm, he could draw



draw only one inference, which was, as set forth at the top of the memorandum, that the transaction was not one between Mr. Carter privately and Mr. Weedon, but was one between the firm of contractors and Mr. Weedon. We also had Mr. Weedon called, and, in his evidence, which appears upon pages 244 and 245, we had the account of how it was that he came to lend the money to Mr. Carter. He states clearly and distinctly that the money was lent to Mr. Carter. A document was produced, and, as Your Honor may remember, there was great suspicion raised by Mr. Parkes at the time about the date of it, until Mr. Weedon proved conclusively that the document was executed on the date it bore, that it had been deposited with the Bank, and that he had only that morning, at my request, when I saw him outside, got the document away from the Bank. However, there was some suspicion, which was absolutely unfounded, about the date. In spite of Mr. Christie's calculations and inferences, it is quite clear, I submit, from the evidence that this was a transaction between two personal friends. Mr. Weedon was a personal friend of Mr. Carter, and he wanted to find an investment. The object to which his money was to be applied had not come off, and he spoke to Mr. Carter about an investment, finally lending the money to that gentleman, who gave him a charge over some private property. What Mr. Carter did with the money—whether he put it into the firm or not, is immaterial; but as a matter of fact, I believe it did go into the firm, as Mr. Carter himself stated in the first instance, so that there was really no necessity or use for the whole of this very elaborate investigation by Mr. Christie. I thought it right to refer to this matter, because I wish to accentuate the fact that this, like the other transactions, was simply one between two private individuals. I should mention that, at the time this transaction with Mr. Weedon took place, that gentleman had nothing to do with Mr. Carter's contracts with the Government, and that he has had nothing to do with them since. He is away, in fact, in another part of the country. As to the advance to O'Hanlan, at the time he had this money from Mr. Carter he was not in charge of any of his contracts. He was in charge of some of the work up to the year 1889 or 1890, but he has not since been in charge. His evidence will be found upon page 596. He there explains why he borrowed the money. He did so, it appears, to complete a house, he having been disappointed in getting the money from some other source. He appears to have mentioned the matter to Mr. Carter, and the money was lent to him for a short time and repaid. Then there is the case of Mr. Rudolph, who is also an engineer, and who has apparently got into some trouble with the Department, as your Honor knows, through some misunderstanding. He borrowed from Mr. Carter the sum of £250 to complete the purchase of the house. Oddly enough, the house was bought, I believe, from Mr. Reid, the Premier. Mr. Rudolph having borrowed the money it was given to him by Mr. Carter in the form of a cheque, that cheque being, I believe, paid into the credit of the account of Mr. Reid. One can imagine the flutterings in the mind of Mr. Parkes if his attention had been drawn to the fact that a cheque of Mr. Carter had been paid into the credit of the Prime Minister.

*Mr. Parkes* : As a matter of fact it was not so paid.

*Mr. Smith* : However that may be, that was the history of that transaction. Mr. Rudolph ceased to supervise any of Carter & Co.'s jobs after that date. With regard to these transactions, all that I wish to submit is that they were perfectly innocent. I do not think there can be the slightest doubt in your Honor's mind—if I may say so—now that you have heard all the evidence, that each one of these transactions was absolutely an innocent one. What I mean to say is that there was no corrupt notion in Mr. Carter's mind or in the mind of those who dealt with him in this way. Of course, as your Honor knows, it may be against the rules of the Department that any officer should have any monetary transactions, however innocent, with contractors who are mixed up largely with the Government, and perhaps your Honor may think that that is the only safe ground to take. I believe it is, and I believe that that is the ground taken by the Department—that in order to be absolutely above suspicion, their officers are not to have any monetary dealings with contractors whom they may have to meet professionally. It is a very safe and sound rule, and if there has been any departure from it in this case, I hope, at all events, that your Honor will hold that the action was innocently done. I think I have now dealt with all the charges *seriatim*, and I submit that the evidence conclusively proves that, as I contend, the main charge in Mr. Parkes' speeches—the charge as to the identification of this firm of contractors with the officers of the Department by reason of the fact of young Mr. Hickson being a partner in the firm—that that charge, upon which all the other charges hang to a very great extent, has absolutely broken down. It really never stood upon evidence, because there was no evidence to support it. With regard to the other charges which are now submitted, there is absolutely no evidence, in the proper sense of the term, which is sufficient to support them. I submit, therefore, that with regard to young Mr. Hickson, it is admitted that he was not a partner; and as to the charges in connection with his having an interest in the firm, instead of their being twenty-three in number, we have now only three. One of these charges, as I have pointed out, is absolutely absurd, because at the time at which that alleged concession was made, young Mr. Hickson was not interested in the firm in any way. As to the other two charges, it has been conclusively shown that young Mr. Hickson's slight connection

with

with the firm could have nothing to do with the action taken by Mr. Hickson in dealing with these important matters; in fact, the thing is too absurd to be seriously contended. I do not know whether Mr. Parkes is going to seriously contend it now. The charges, as I submit, having absolutely broken down one and all of them, and I venture to think, having been made, as I have said more than once, and have been able to point out more than once, without that due care and caution which every man with any sense of responsibility in dealing with a great and serious matter, such as the charging of a high officer of the State with corruption should take, I submit that it is a matter to be considered, how these charges came to be made at all. With regard to that I think we have not far to go to seek for the explanation. If your Honor will turn to Mr. Parkes' own statement made here on oath, and which appears on page 472, you will see that he gives us a history affording a clear explanation as to how it was that this thing came about, so far as the charges relating to Mr. Hickson are concerned. Bearing in mind, as I contend, that those are the charges which are the foundation of this Commission, it seems to me that the first movement at all in this direction, the germ of the whole matter, lies in one Webster. Webster's suggestion was the first which set Mr. Parkes' mind moving with regard to Mr. Hickson. Your Honor may recollect that Mr. Parkes stated that from 1890 to 1893 he had in his employment a man named Webster, and that it was he who gave him certain information with regard to Mr. Hickson's work in Adelaide. Mr. Parkes tells us that Webster had told him—

That Mr. Hickson, when he was employed at Adelaide, as an officer in charge of public works, had had misfortunes with those works which had put the Government of South Australia to a considerable loss of money. I made further inquiries about this matter, and I found that Mr. Hickson's works had come to grief in that colony. Then I became a little suspicious.

To my mind that was the germ of the whole matter. From that date Mr. Parkes became a little suspicious about Mr. Hickson. Mr. Parkes also tells us what his attitude was with regard to the Public Works Department. He tells us that at about this time—viz., 1891—he became a candidate for East Sydney, and that at the time of the election he heard from various sources, such as contractors' workmen, talk about defective work being done in the Sewerage Department. One can imagine the sort of talk which goes on at electioneering time. We all know that things are very likely indeed to be exaggerated, and we can imagine the sort of talk that went on in this case, and the sort of pledges which were given in return in the event of the candidate's being successful. We all know what goes on at electioneering time. At all events Mr. Parkes was elected, and we are told that he then turned his attention to the Works Department. He thought that the public works of the Colony should be managed upon a different footing altogether. He had made up his mind, from what he had heard, that very drastic measures were necessary to put the Department upon a proper footing. Your Honor will remember that Mr. Parkes told us that after his election he was sent for by the late Sir Henry Parkes, and that it was suggested that Mr. Varney Parkes should take the portfolio of Secretary for Public Works; but apparently the scheme for the reform of the Public Works Department which had been adopted by Mr. Varney Parkes did not find favour with the then Premier. At all events the portfolio of Secretary for Public Works was given to Mr. Young, and Mr. Varney Parkes did not become Secretary for Public Works. Mr. Parkes tells us that after that he tabled various motions in the House dealing with this very question of the reform of the Department of Public Works, but there was one motion which he did not mention to which I drew his attention in cross-examination. It is already in evidence before this Commission, and is set out upon page 399. It shows the nature of the reform for which Mr. Parkes was moving. His object apparently was the simplification of the machinery of Government, and for economy's sake to wipe away all the professional men in the departments. Engineers, surveyors, architects, lawyers, and photographers, were to be abolished, and the work was to be performed by independent competitors outside. There was another motion, as Mr. Parkes informed us, subsequent to that, and that was for a select committee to inquire into the method of contracting. It was dropped, because it was pointed out that it really amounted to a vote of censure upon the Reid Administration. Your Honor will see that that was the attitude of Mr. Varney Parkes with regard to the Department of Public Works at the time Webster came forward and gave rise to these suspicions in Mr. Parkes' mind as to the incompetency of Mr. Hickson. Who this Mr. Webster is, or where he is, nobody knows; but as, when I was pressing for this information, your Honor told us that it was not material to inquire further where he was, because Mr. Parkes had been good enough to tell us that, in turning to the official papers of South Australia, which were fortunately in the library at Parliament House, he found that Mr. Webster's statements were fully confirmed, I did not press the matter further. Mr. Parkes said, indeed, that Webster did not tell him as much as he found in these papers at Parliament House, so I think we may take it that the ground of these suspicions is to be found in the Parliamentary and other official papers which Mr. Parkes found. He was good enough to tell us where the books were to be found. They were produced here, and the consequence was, as your Honor will recollect, that we have attached to the evidence three documents extracted from these  
papers

papers which may be taken, I suppose, as the foundation of these disquieting rumours about Mr. Hickson. I should mention that particular reference was made to a particular work in South Australia—the Rivoli Bay Jetty. As to the papers put in, we had the evidence of Mr. Hickson, taken before the arbitration which arose out of the Rivoli Bay matter; and we had the report of Mr. Higginbotham, a report made, as explained by Mr. Hickson in his evidence, at the request of the Treasurer. We had also the evidence of Mr. Higginbotham, taken before a Royal Commission, or rather, certain parts of that evidence. These documents are, I understand, to be printed as appendices to the evidence. Mr. Parkes, in cross-examination, stated to me that he based his suspicions upon some evidence given by Mr. Hickson before the Royal Commission in South Australia. It turns out that that must be a mistake, because Mr. Hickson was not examined at all before the Royal Commission. I believe Mr. Parkes put that matter right afterwards, and it was stated that what he had in his mind was the evidence given by Mr. Hickson before the arbitrators. I shall not go into the arbitration matter in detail, but I will merely say that, if there be anything in the evidence of Mr. Hickson before the arbitrators which gave rise to the suspicion that any of his work had come to grief, or that, as Mr. Parkes put it when he was pressed upon the point, there was any action of Mr. Hickson's in South Australia of a similar nature to the matters with which he is charged before this Commission, namely, a corrupt connection of some kind or other with contractors—if there is any evidence, either of incapacity or of improper conduct of that kind, perhaps Mr. Parkes will be able to put his finger upon it when he addresses your Honor. At present I am utterly unable to see how any fair-minded man reading the evidence and the award of the arbitrators could have come to such a conclusion as to have had even the semblance of a suspicion in his mind. Your Honor knows what the contest in that arbitration case was. As far as I can make out, a great deal turned upon the question whether or not a certain plan was put in was the Government plan, and therefore bound the Government, or whether it was a plan which emanated from the contractors—whether it was their plan entirely, and whether, therefore, the Government was responsible for it. As Mr. Higginbotham points out in his report, Mr. Hickson, for the purposes of identification, and for those purposes only, had, on his arrival in the colony, affixed his name to the plan, and that gave the contractors a leg to stand upon in their contention. However, the arbitrators made their award, and it was to the effect that these contractors had no claim with regard to that plan. As far as I can make out from the report of Mr. Higginbotham and others, the signing of the plan was the only thing involving anything approaching to censure, so far as Mr. Hickson was concerned. There was no censure in the strict sense of the term, even as to that, because it is perfectly clear from the papers that Mr. Hickson arrived in the colony when the whole question of letting this particular contract was pretty well settled, and when the plans had been prepared by the contractors, as seems to be the practice in that colony. As Mr. Higginbotham points out, Mr. Hickson, without official experience, fell into the error of affixing his name to this plan, and that is the whole matter as far as I can understand it. With regard to the Commission which was appointed in South Australia, your Honor may remember that it was clearly pointed out by the President that it was not aimed at any individual officer, that there was no suggestion of blame attaching to any particular officer at all. He pointed out clearly what the object of the Commission was—that it was to inquire into the system of public works, as to whether they had, in that colony, got hold of the right method of going to work in such matters. Without blaming anyone in particular, the question which the Commission had to solve was whether the colony had got hold of the right method of carrying out its works. The report was not put in, because it does not relate to the branch of which Mr. Hickson was the head. As far as I can discover, there is no other report of the Commission affecting the department of which Mr. Hickson had control. That being so, I submit that, when your Honor reads the official papers which we have obtained from Adelaide, you will come to the conclusion that when Mr. Hickson left that colony, as he told your Honor, he left it with as clean and as high a record as he brought with him from the old country. We have in evidence the nature of the recommendations which he brought out with him. He brought out, among other documents, a letter from the Agent-General of the colony in London, and we have also in evidence a letter written to Mr. Hickson at the time the Government of South Australia found it necessary, in consequence of the reorganisation of the branches of the Works Department, to dispense with his services, and pointing out that it was in consequence of that reorganisation and for no other reason that that course was taken. I submit that that letter shows conclusively that at the time Mr. Hickson left the colony he possessed to the fullest extent the confidence of those he had to serve there. I am very glad the thing has been sifted to the bottom, because it shows that, after all, the suspicion which began in Mr. Parkes' mind from this circumstance, and which has kept growing and growing ever since, is, so far as it is founded upon the disclosures of these South Australian papers, absolutely without foundation. That must be the conclusion to which anyone approaching an examination of the matter with a perfectly unbiassed and judicial mind must arrive. Mr. Parkes tells us that he has no personal grudge against Mr. Hickson—in fact, he tells us that he did not know Mr. Hickson—that he did not meet him personally until he came in contact with him when he, Mr. Parkes, was a member of the

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Public Works Committee. We had before the Commission some evidence as to what took place in connection with that Committee. That evidence is shortly this: A certain trouble arose upon the Committee. Mr. Parkes had been the Chairman, and, in consequence of that trouble, he thought that the only course open to him was to resign. The trouble, I may mention, arose out of the Pymont Bridge question, which had been before the Committee for some time, and upon which the Committee had taken voluminous evidence, Mr. Parkes, as Chairman of the Committee, calling a great deal of outside evidence. This evidence having been called, Mr. Parkes, as Chairman, was permitted to make a statement before the Committee proceeded to consider its report, and in view of that statement it was thought necessary to recall Mr. Hickson and Mr. Darley, whose evidence, of course, would carry great weight with the Committee. These officers were both recalled, and the inquiry was virtually reopened. Mr. Hickson was cross-examined by Mr. Parkes at some length, and, the matter having been reconsidered by the Committee, they came to a certain conclusion. Portion of that report is set forth in Mr. Parkes' evidence upon page 474:—

The resolution which contains the present Committee's decision in their inquiry was passed on Wednesday, 7th November, but at the next meeting of the Committee, in consequence of certain statements made by the Chairman in condemnation of the proposed timber bridge approved of by the Committee, it was decided to reopen the inquiry for the purpose of further examining the Commissioner and Engineer-in-Chief for Roads and Bridges, and examining the Engineer-in-Chief for Harbours and Rivers. These officers were accordingly called before the Committee, and closely questioned on the points which had been raised by the Chairman. The evidence dispelled all doubt as to the stability of the bridge as designed, and confirmed the Committee in their decision to recommend its construction. The Commissioner and Engineer-in-Chief for Roads and Bridges pledged his professional reputation that the bridge will be thoroughly suitable—perfectly safe, containing no structural defects, and serving the probable traffic between Sydney and Pymont. He would prefer, he said, an iron bridge; but he recognised that it may not be desirable at the present time to erect such a bridge, seeing that his estimate of its cost is £220,000.

Your Honor knows, from a perusal of the documents, probably, that by a majority of eleven to four Mr. Parkes' contention was overruled, and a report was drawn up, based in a great measure upon the evidence given by Mr. Hickson and Mr. Darley. The Committee came to the conclusion that they would be right in relying upon the evidence given by these two officers—in fact, they say so in their report. Mr. Parkes then resigns, and he tells the public, through the press, that he had always thought the Committee was sworn to the salvation of the public funds, but that he found that the majority of the members were bent only upon the salvation of the interests of the official heads of the Public Works Department. That, he told us, was his experience of the Public Works Committee. Under these circumstances, and holding these views, he thought it right to resign his position as Chairman of the Committee. He seemed to think that his colleagues were acting more with a desire to save and to protect the officers of the department than with the object of protecting the interests of the public. I merely mention that as showing the nature of the conclusion which Mr. Parkes is so very hasty to draw. I need not refer to that part of the question except for that particular purpose. At all events, although Mr. Parkes has told your Honor that he has no personal grudge against Mr. Hickson, your Honor sees that he had had his suspicions aroused by that man Webster for a number of years; that he then made certain statements to the Public Works Committee, which Mr. Hickson's evidence apparently upset, the Committee agreeing with Mr. Hickson and disagreeing with Mr. Parkes, the consequence being that Mr. Parkes resigned. It will be remembered that when Mr. Parkes made his speech in the House he referred to the evidence of Mr. Hickson on that occasion as being so inconsistent as to amount almost to perjury; so that it was not only his late colleagues on the Public Works Committee who were charged with this, that, and the other thing, but also Mr. Hickson, upon whose evidence the Committee placed so much reliance. I have mentioned these circumstances because they tend to show the attitude of Mr. Parkes' mind towards Mr. Hickson without in any way contradicting his statement that he had no personal grudge. I would submit that these two things are perfectly plain: that Mr. Parkes had these grave suspicions as to the rectitude of Mr. Hickson—that is the only way to put it—and he also concluded that Mr. Hickson had committed something like perjury before the Public Works Committee. Furthermore, he had the feeling that his late colleagues on the Public Works Committee had preferred to believe Mr. Hickson, in spite of his own statement. Besides this we have clear evidence as to Mr. Parkes' attitude towards the Public Works Department generally. He was actuated at that time by a desire to sweep away altogether all the professional officers—to make a clean sweep and to begin on other lines altogether. That being the position of things, what happened? It appears that this firm of Carter, Gummow, & Co., as I

think your Honor will admit, is a firm which stands pretty well with the department. Not only the present Secretary for Public Works, but the late Minister, who is now leader of the Opposition—so that there is no political question at all in the matter—have come here and have spoken very highly of this firm of contractors. They are an enterprising firm—your Honor can see that—and apparently they were getting a little bit ahead of other contractors, and the feeling got about among some of these contractors that Carter, Gummow, & Co. were too much in the swim, as Mr. Parkes told the House in his second speech. He said that these contractors felt that Carter, Gummow, & Co. were so much in the swim, and that they were so much out of it, that they would like “to burst Carter, Gummow, & Co. up” I do not pretend to be able to give a definition of that elegant expression. Your Honor, I think, was inclined to take a limited view of it, and you were no doubt right in supposing that it did not mean that there was a desire to burst the firm up financially, but to break them up in their successful career with the department in getting contracts—nothing more than that. That may have been the intention, but, even putting that construction upon it, there is no doubt that these contractors were a bit excited, and we all know—Mr. Parkes certainly ought to have known—how very unreliable statements of this kind are in such cases. In his statement to your Honor, Mr. Parkes said :—

That brought about me certain contractors who gave me certain information. In every case I made an effort to find out the truth of their information. Of course I found out that a good deal of it was false, and that some of it was true.

Each of these contractors appears to have had his grievance, and one can quite understand how unreliable, in the circumstances, their statements were likely to be. One can quite understand that they would become excited. They had their grievances to start with ; but as they went on they exaggerated them to such an extent that the original germ of truth became absolutely unrecognizable. That seems to me to be the way in which this inquiry has come about. We have had evidence that this agitation was got up, in a great measure, by Williams. He was running to and fro between Mr. Parkes and the other contractors, and he afterwards brought in Maddison. One can quite understand how all these statements, one on the top of the other, got exaggerated. It is perfectly evident that there was no reasonable or systematic attempt made to get down to the truth of them. Unfortunately Mr. Parkes already had his mind biased by certain suspicions about Mr. Hickson, suspicions which, as I have pointed out, were perfectly unfounded ; in fact, Mr. Parkes has been a prey to suspicions all through. He suspects Mr. Hickson. He suspects his colleagues upon the Public Works Committee. And, working upon that bias, these contractors were able to instil into his mind the firm belief, when he made his speech on 26th September, that he was going to prove all these grave charges against Mr. Hickson. These contractors discovered, no doubt, that Mr. Parkes was a very willing listener : and that, to my mind, if I may so put it, seems to be the plain history of the circumstances leading up to this inquiry—a simple explanation as to how it is that Mr. Parkes now finds himself in the unfortunate position in which he is placed—the position of one who, from his public place in the House, and under the privilege rightly afforded to our members of Parliament, has brought charges against a high officer of State, which are not only absolutely untrue, but which never at any time had any reasonable or solid foundation in fact. I have no more to say except this, that I think there can be no doubt that there has been a most searching inquiry under this Commission, so that, whatever may be the result, at all events we shall know that no stone has been left unturned to get at the real truth of the working of our great Department of Public Works. There is only one point to which I wish to draw your Honor’s attention. I mentioned it, I think, at the beginning of my address. Although these charges have been formulated by Mr. Parkes, I conclude that your Honor will deal with the charges as made by him in his speeches, and with regard to those speeches I have assumed, all through, that they are formally in evidence before your Honor ; but, if there be any doubt about it, and if it should be necessary, I would ask that the speeches of the 26th September and the 12th May be recorded upon the minutes of proceedings of the Commission. Your Honor may remember that your Commission empowers you to deal with charges made in certain speeches.

*His Honor* : For the purposes of this Commission I take judicial notice of *Hansard* without the necessity of proof. No one, I presume, denies the substantial correctness of the reports. I hardly think, therefore, that it is necessary to include them in the minutes of proceedings of the Commission. I may or may not in my report allude to certain passages in those speeches. Perhaps I may feel myself bound to do so, because they may be taken to be the primary foundation of the Commission.

*Mr. Smith* : Then I have nothing to add except to say, on behalf of my client, Mr. Hickson, that with regard to those charges which affect his integrity, we leave the matter in your Honor’s hands with the most absolute confidence. With regard to the department generally, I may say that, with the exception of those few mistakes to which I have alluded, there is nothing chargeable at all against any one of the officers. On the contrary, as far as the evidence goes, they appear to have all done their duty and

to

to have dealt with these contractors to the best advantage of the country. It is quite evident that these contractors have been dealt with in a way exactly similar to that in which every other contractor who has dealings with the Department has been dealt with. I am much obliged to your Honor for having allowed me to address you at such length, I hope I have not labored the case unnecessarily. At the same time I hope your Honor will not think that in any of the remarks I have made I have expressed myself too strongly. I should like to say this in conclusion, so far as Mr. Hickson is concerned, that, Mr. Parkes having claimed here that he represents the public, I make the same claim on Mr. Hickson's behalf. He is at present the permanent head of the great spending department of this Colony—the Department of Public Works—and, acting in that capacity, I think he is fairly entitled to claim that he also represents large public interests, it being incumbent upon him to satisfy the public as to the way in which the public works of the Colony have been carried out under his control. This being so, I have endeavoured to keep that fact before my mind in dealing with these charges. Had it been a personal or private matter I might have, been tempted to make my remarks somewhat stronger, because I confess that Mr. Hickson has very strong feelings in this matter, and very naturally so, seeing that these charges have been hanging over his head since September last year. But whatever his personal feelings may be, I know his desire is that nothing should be put before your Honor except in a way which is perfectly fair and quasi-judicial. I have, therefore, endeavoured to adopt that line of conduct in dealing with the large mass of evidence which has been put before your Honor.

*His Honor*: I may say that I certainly do not think that, under the circumstances, Mr. Smith, you have exceeded what may be considered proper limits in regard either to the time occupied by, or the mode of, your address.

*Mr. Smith*: Perhaps your Honor will allow me to mention the printed papers under date of 19th December last. The papers contain Mr. Hickson's statement with reference to Mr. Parkes' speech of the previous September. I would ask that these papers be printed as appendices to the evidence.

*His Honor*: I will direct that that be done.

His Honor, at 1:20 p.m., adjourned the inquiry until 10 a.m. on Friday, 2nd October.

C. E. R. MURRAY,  
Commissioner.

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FRIDAY, 2 OCTOBER, 1896.

His Honor the Commissioner sat at the Board room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. W. Andrews, solicitor, advising); attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, bond clerk, also attended.

Louis Blayney Mitchell, Henry Charles Mitchell, Trenham Old, John Alcock, and Richard Adams, were sworn and examined.

*Mr. Parkes*: Before Mr. Andrews commences his address, I should like to say a few words with reference to the application made by Mr. Smith at yesterday's sitting of the Commission, that the *Hansard* reports of the speeches, which are the foundation of this inquiry, might be placed on record upon the minutes. I endorse Mr. Smith's application, and for this very good reason—that there can be no doubt but that this Commission was based upon the speeches, and not upon the charges which I have handed in to your Honor. Mr. Friend, the Secretary of the Commission, waited upon me at the Legislative Assembly Chambers, by your Honor's direction, shortly after the issue of the Commission, and informed me that your Honor's proceedings would be greatly inconvenienced if I were to put certain charges before you. I told him that I was not a prosecutor in the matter, and that I need not have appeared before the Commission except as a witness. Mr. Friend explained to me that your Honor only required the charges which were contained in my speeches in the Legislative Assembly put into a definite form in writing. I gathered from what he said, that your Honor desired me to indicate the nature of the charges to be inquired into, and which I believed I had evidence to sustain. I put in the charges as I pointed out to Mr. Friend at the time, in compliance with your Honor's suggestion. I told him that I could not guarantee the evidence at that stage—that I could not guarantee the absolute truth of the allegations I made. Of course, could I have done that, there would have been no need for this Commission. This Commission was issued in order that full inquiry might be made into certain indefinite charges. I explained to Mr. Friend the position in which I was placed. I remember pointing out to him that without doubt if I failed to substantiate the charges I made they would be used as a weapon against me. However, he assured me that they were simply asked for as an indication of the course of inquiry I should prefer

prefer the Commission to take, it being left to me to bring forward evidence to sustain such definite charges as I might see my way clear to make. Under these circumstances I should prefer that the speeches which I made in the Legislative Assembly, and which are really the basis of this inquiry, should go in as well as these charges, particularly as reference has been made to various parts of those speeches, which references do not give the true purport of the words I used. I think your Honor will see the reasonableness of the application.

*His Honor* : It is a question of expediency,—that is, whether it would be better to make the speeches part of the material which will be bound together as forming the history of the Commission, or to leave them as they are, to be fished out of the proceedings of Parliament generally. Perhaps it would be more satisfactory to persons who read through the whole of the proceedings of the Commission from beginning to end, if any person should ever do so, to have these speeches before him, as part of the proceedings and attached to the other portions of the report. I think that, as you, Mr. Parkes, have applied that this should be done the speeches might, perhaps, be included in the proceedings. I can see that the application is a fair one. I will ask you to mark off what you consider to be the speeches having special reference to the matters before the Commission, so that no more of them than is absolutely necessary may be printed.

*Mr. Parkes* : I asked some questions with reference to the contracts ; but they are very limited in their scope, and perhaps it will not be necessary to include them. There are only two speeches, I think, which need be printed.

*His Honor* : I will direct, then, that such speeches as you may indicate be entered upon the minutes to come immediately before the beginning of your address. Of course, if the speeches are only to be obtained by turning to *Hansard*, any person reading the report might be put to some trouble in finding out what this important element in the proceedings actually was.

*Mr. Parkes* : One of my chief reasons for making the application is that extracts have been made from my speeches, by Mr. Smith and others, which might have a wrong effect, if separated from the context.

*His Honor* : I will now call upon Mr. Andrews to address the Commission on behalf of Messrs. Carter, Gummow, & Co.

*Mr. Andrews* : May it please your Honor,—I should like to preface my address with this observation that, inasmuch as Mr. Smith has gone fully into all these matters which may be said to be common to the case, as it affects the Department and as it affects my clients, it appears to me that it would be a waste of time upon my part to merely repeat the arguments which Mr. Smith has adduced, and which have been so clearly and eloquently put before you Honor. Mr. Smith's address then, to a certain extent, minimises the task which I have before me. It seems to me that the chief matters with which it will be necessary for me to deal will be the charges of defective work, of which there has been direct evidence tendered to the Commission, and of implied defective work by reason of the alleged shortage of cement. There is another question which the Department has not answered because they have considered it our duty to do so. It relates to the sureties given in connection with the Marrickville contract and the association of Bond & Hudson with one of the concessions alleged to have been made to my clients. This last question of Bond & Hudson's connection with my clients has been gone into thoroughly by Mr. Smith, and so far as that is concerned I do not think I need say very much. There are one or two little points with regard to Mr. Hickson, junr., upon which it will also be necessary for me to say a few words, inasmuch as they appear to me to be points which your Honor will have to take into consideration if it be necessary for you to go any further into the question whether that young gentleman was or was not a partner in the firm of Carter, Gummow, & Co. I propose to deal first with the question of defective work, and I will take first the defective work concerning which there has been direct evidence. I do not propose to deal with this work under the headings of the different contracts in connection with which it is alleged ; but I propose to take the evidence as given by each individual witness. I would impress upon your Honor that it has been sworn here absolutely by Mr. Carter, Mr. Gummow, and Mr. Forrest, the only contractors who are available, with the exception of Mr. Gillan, who had nothing whatever to do with the contracts in N.S.W., that they, to the best of their ability, endeavoured to carry out all the various works which have been entrusted to them by the Government during the last six years faithfully and well, and that they have extended to each and all of these works all reasonable personal supervision. Mr. Carter has told us that he personally superintended the purchase of material. He tells us that in every case he bought and paid for the very best material in connection with these various works. Your Honor will see that inasmuch as some of these works are carried out in both day time and night time it would be absolutely impossible for the contractors themselves to extend their personal supervision to every detail of the work which is done. To a certain extent they are relieved from the exercise of supervision such as would be exercised over ordinary contracts, because the  
Government,



Government, in their wisdom, have thought it right to employ men having a practical knowledge of the details of the work to supervise the whole of it. These inspectors are upon the ground during the whole of the time work is going on, whether it be by day or by night. I say, therefore, that my clients, under any circumstances, were entitled to place some reliance on this governmental inspection. They were entitled to assume that these inspectors would do their duty in a proper and businesslike way; and I submit, your Honor, that, as far as the evidence upon that point which has been tendered to this Commission goes, it shows that every one of these inspectors has carried out the duties imposed upon him by the department in a thorough and conscientious manner. If your Honor remembers the evidence concerning Inspector Reid, who was upon one of the North Shore contracts, it will enable you to form an idea of the faithful way in which some of these men have endeavoured to do their duty and to protect the interest of the department by which they were employed. Your Honor will also see that in large undertakings like these, which have extended over a period of from six to seven years, the contractors are to a certain extent at the mercy and in the hands of their workmen. No matter how careful the inspectors may be—no matter what may be the extent of the supervision exercised by the individual members of a firm of contractors engaged upon works of this kind—if a dishonourable and malicious workman is determined, for his own purposes, to do defective work there is absolutely no way of preventing him from finding the opportunity to do it. It must be borne in mind that during the period of years covered by these contracts my clients have employed considerably over 1,000 men. That brings me to this point—that out of that large number of men the only men who have come before this Commission to give evidence of defective work have been Dawson, Wright, Benson, Darcus, and Caughey. These are the only men who have come forward, and I hope to satisfy your Honor before I sit down that in most of these instances the evidence given is not to be relied upon. I would also point out to your Honor that the whole of the witnesses who have given evidence as to this alleged defective work have said that it was done without the knowledge of any one of the contractors. Dawson said that his bad work was done, not at the request of, but with the knowledge of, Reid, the contractor's foreman, at North Shore. Reid, the foreman, as your Honor may remember, absolutely denied that he knew that Dawson was doing this defective work. As to Wright, his evidence related principally to defective work in the sewer known as the Alexandria contract No. 61. He swore here positively that the concrete in that sewer was in some cases not put in to a greater depth than from 4 to 6 inches, the specification providing for a depth of, I think, at least 9 inches. The place which Wright indicated has been inspected by an independent witness, by a gentleman who has been brought here by Mr. Parkes to give evidence. I take it, however, that the whole of the witnesses who have come before your Honor may be said to be independent witnesses. What was the report of this gentleman in regard to this work? As far as he could ascertain, at the place pointed out by Wright, the concrete was put in to even a greater depth than was required by the specification. Wright also told us something about Mr. Forrest, who was supposed to be supervising, at one time, one of the North Shore contracts. He told us that Mr. Forrest was a gentleman who was addicted to drink, and, if my memory serves me rightly, he said that a very considerable portion of his time was spent in the absorbing occupation of pitch-and-toss. Your Honor has seen Mr. Forrest, and I venture to say that from the way in which he has given his evidence before this Commission you will arrive at the conclusion that he certainly is not a man who is addicted to drink. Furthermore, he has himself sworn that he does not drink and that he never pitched a coin in his life. I put it to your Honor, so far as Wright is concerned, that his evidence is not worthy of any credence. I come now to Benson, who gave some evidence as to a defect in a pipe-joint on the Marrickville contract. I do not think I need say much with regard to his evidence, because the department themselves have dealt with the matter in the evidence of Mr. Griffiths, who has told your Honor that the contractors are in no way responsible for any mistake or defect of the kind. It would seem to indicate that this witness, at least, came here to give evidence not knowing thoroughly what he was talking about. He may have thought in his wisdom that the mistake, if there was a mistake, amounted to defective work. It may have been Benson's opinion that this work should have been done in a way in which it was not done, but it was not his duty to determine that. That is a matter which rests with the responsible officer of the department, and he being satisfied with the way in which the work was done, that, in this instance, amounts to a perfect exoneration of the contractors. As far as I can remember, that is the only evidence which Benson gave in reference to defective work. Then we had Darcus before us. Your Honor will remember what style of man he was. I have been wondering ever since the man gave his evidence how my clients could have succeeded in any of their undertakings without his assistance. He led us to suppose that, at least as far as the Marrickville contract was concerned, he certainly found all the brains. What does his evidence amount to? He tells us that a siphon at the Illawarra Road was wrongly put in, and that this work was done by the contractors behind the back of the Government. The Government themselves, however, say, through Mr. Griffiths, the supervising engineer at that time, that the siphon was put in by his direction and at his request—that the work was done in a perfectly satisfactory

satisfactory and proper manner. That, it seems to me, is a complete answer to what Darcus may have thought on the subject. I think this witness also told us that some batches of concrete were mixed in an improper way. This gentleman was working up and down the contract, he tells us, supplying the brains for the whole of the work, and he had an opportunity, so he says, of seeing what was going on from the beginning to the end of the job. As the result of his acute observation, he says he may have seen five batches of concrete improperly mixed and used in the work. Suppose that all this genius tells us concerning the concrete is true, will your Honor, or will anyone else, say that, because a stone or two of a greater or less size than that specified is put into a batch of concrete—five batches if you like, five batches out of 6,000 or 7,000—that that is evidence of defective work on a job of such magnitude? The only conclusion to which any reasonable man can arrive is that a trifling thing of that kind—even admitting it for the sake of argument to be a fact—cannot in any way affect the stability of the work. Darcus also told us some story of an alteration of a chamber which was erected in a portion of this contract. A question arose as to what claim the contractors should put in by reason of the alteration. Darcus, it seems, was asked to value the wood required for the centering, and he valued it at from £5 to £6. He seems to have mentioned that valuation to Mr. Snodgrass, who was then a member of the firm, and Mr. Snodgrass, according to Darcus, said that he would have to charge £100 for the timber. Whether Mr. Snodgrass ever intended to charge £100 or not is immaterial from the fact that Mr. Millner, who went into this question, has told us that no claim was ever made by Mr. Snodgrass, and that he himself valued the timber at £16, that being the amount actually paid for it. I may point out that in cross-examination Darcus admitted that the £5 or £6 referred to in his evidence in chief was only a part of the timber which would have been used. I think that circumstance of itself tends to show that he is not a witness who can be relied upon, especially when it is considered that the defective work which he alleged was proved to be no defective work at all, and when he himself speaks of five batches of concrete out of 7,000 or thereabouts as forming substantially bad work. He led your Honor to suppose that my clients endeavoured to obtain £100 for timber which was worth £5 or £6, whereas it has been proved conclusively by the department that Mr. Snodgrass never asked for £100, and that nothing like that amount was ever paid. Mr. Caughey is the next workman to whose evidence I shall refer. What does he tell us? The only evidence he gave as to defective work is that at one of the shafts on the Glebe job there was put in at the bottom a small quantity of stone—he thinks about a foot—instead of concrete. That is like a great deal of the rest of the evidence we have had as to defective work. If this is the sort of evidence upon which the contractors are to be charged with doing defective work upon these large contracts, I think your Honor will have no hesitation whatever in dismissing that part of the case from your mind at once. Inspector Reid told us that at a shaft on one of the North Shore contracts he one day caught some men putting down dry stone. That allegation has been cleared up entirely by the evidence of both Mr. Davis and of Inspector Fowle. Those gentlemen looked into the matter thoroughly, and the result of their investigation was that, although dry stone may have been put down the shaft, it was used finally in the form of concrete. That statement of Reid therefore does not help forward in any degree the allegation of defective work. To remind your Honor of the sort of inspector Reid is, I will mention the circumstances, which transpired in the evidence, of his having discovered a chip upon one of the bricks, and his having in consequence of that discovery reported that defective brickwork had been done. When the department came to investigate that matter it was found that a chip about the size of a man's finger nail had been knocked off one of the bricks. Is it at all likely that this man, who was so particular as to report a chip off a brick the size of a man's finger nail as defective brickwork, would allow any really defective work to be done upon any job upon which he was an inspector. One would think that his eagle eye would be quite sufficient guarantee against anything in the nature of defective work. Reid, it has been shown—and my clients are of the same opinion—is a man who conscientiously endeavoured to do his duty according to the best of his lights; but although some men may endeavour conscientiously to do their duty, they manage to do it in such a way as to make it impracticable for other men who may have the misfortune to be associated with them in work or business to do theirs. I would remind your Honor of Reid's pathetic description of an interview which he had with Mr. Snodgrass just before 11 o'clock one evening. He seems to have thought that when he got to the top of a particular shaft he would have been murdered, but Mr. Snodgrass's murderous intentions seem to have resolved themselves into the very modest request that he would have a drink or sing a song. I think the evidence, as a whole, has gone to show that Reid is not by temperament fitted to be an inspector upon works of this class. It is found that the Australian working-man will not allow anyone to boss him in respect of any particular class of work of which he claims to have a thorough knowledge. As an instance of the indiscreet manner in which Reid performed his duties in the capacity of inspector, I need only refer your Honor to Inspector Fowle's report, and to the evidence given before this Commission by Mr. Spencer. The only other defective work of which Reid complained was this. He says that on one occasion the stone was not quite to his liking; that it was a little bit dirty, as he put it.

Well,

Well, that is so absurd an allegation in connection with a charge of defective work as applied to these large undertakings that I do not think I need say another word in reference to it. Some other evidence under this heading has been given by Chiene. Now, in connection with the question of the liberality of Mr. Carter, I should like to refer your Honor to Chiene's evidence in reply to Questions 4965-6-7 and 8. It will be seen there that, after Chiene had left the employment of Carter & Co., Mr. Carter gave him, for no apparent reason, a present of £20. Notwithstanding that gift, notwithstanding that act of kindness and generosity, Chiene comes here and imputes to his benefactor that he has, in connection with these contracts, done unreliable work. When your Honor comes to sift the evidence, you will find, I think, that Chiene knew nothing whatever about the matter of which he spoke. Someone appears to have told him that the work was done by certain persons for somebody else. That is the kind of evidence he gave. Moreover, he tells us that he saw one of the workmen going into the office with Mr. Carter, he—Chiene—being told to clear out. Because he was told to clear out, he assumed that Mr. Carter and the workman who went into the office with him were conspiring to defraud the Government. I think that is quite enough to illustrate the value of Chiene's evidence. The next gentleman who gave evidence under the heading of defective work was Mr. Bagge. This gentleman was an officer of the department for some years. Judging from his outside reputation, Mr. Bagge is a man of the strictest integrity. He has the reputation, moreover, of having always endeavoured to efficiently discharge his official duties. But there can be no doubt, I think, in the light of the evidence put before the Commission, that in regard to some of the matters of which he spoke he has been very much misled. His memory, also, as appears to be the case with all of us as we advance in years, appears to be getting defective. For instance, he has the idea in his mind—and it is really very difficult to form an opinion as to how it came there—that a culvert which was being erected at Strathfield, on the Parramatta Road—I mean the culvert known as the "Monier" culvert—collapsed while it was in course of construction. This idea on the part of Mr. Bagge was controverted by Mr. Smith. The allegation that the culvert had collapsed was proved to be utterly without foundation by the same witness, who had charge of that particular work. Mr. Bagge says that Mr. Davis afterwards took him out to the site of some contract and showed him some arches in the construction of which sand, instead of mortar, had been used. Your Honor will remember that Mr. Bagge could not even recollect the locality of this work. He had some idea that it was at Rose Bay, and it was only after the greatest difficulty that he could be persuaded to believe that the work to which Mr. Davis really took him was that known as the Waverley contract. In regard to that contract it has been proved—and this is the extent of the defective work—it was really not defective work at all—that the inspector had passed bricks which did not seem to Mr. Davis to come up to the requirements of the department. Mr. Davis condemned the bricks, not in the ordinary way, but in this way—that, although they had been passed by his own inspector, he did not consider them fit to be used. He insisted upon the use of a better class of bricks, and his request was willingly complied with by the contractors, the department paying no more for the work. If there had been, as Mr. Bagge suggests, any defective work in the contract, it is not probable that the department would have paid for putting it right. Mr. Bagge, who was at that time the responsible officer under the Under Secretary in regard to this class of work, said that certain arches out in that direction—here again his memory was very cloudy as to the exact locality—had collapsed, and that Mr. Davis and he saw them together. The strange part of the incident is that if, this grossly negligent work was done, Mr. Bagge made no report of it to his superior officer. Bearing in mind the reputation which Mr. Bagge bore inside, as well as outside, the department, I would put it to your Honor that it is improbable that he would have allowed defective work of that character to pass without making a report, or without seeing that Mr. Davis made a report to his superior officer. I think that circumstance goes to show that Mr. Bagge's mind is in a state of confusion in regard to that as it is in regard to several other matters. If there were any instances in which arches collapsed, there is no evidence to show that that accident occurred in connection with the contracts of my clients. Mr. Bagge is evidently confusing some other work with this particular job at Waverley. He, like many other men who are no longer young, is a firm believer in the old systems which he learnt in his youth. He could not see, in any system of construction, an improvement upon the methods which he was taught as a boy. Your Honor knows very well that in the profession to which I have the honour to belong, as well as in other professions, there is what might be termed a constitutional objection to new fangled ideas. Without meaning to cast any reflection upon Mr. Bagge, I would point out that he is another witness to the generosity of Mr. Carter. He himself admitted that, after he had left the department, and when he could under no possible circumstances have benefited the firm, they bought material for him, and supplied him with money, so that he might make himself comfortable at his residence at Minto. Mr. Bagge, I am sorry to say, like a great many other persons who have been similarly benefited, is now inclined to regard the transaction as of a purely business character. In his evidence on the first day on which he came here, Mr. Bagge said that, from his experience of Messrs. Carter, Gummow, & Co., he could say that they were a reliable firm, and that they carried out their duties in a proper and

satisfactory

satisfactory way ; that, so far as he was concerned, he would trust them with the carrying out of any work under his charge, in preference to any other firm of which he knew. If the idea, which he subsequently mentioned, of the collapse of arches and of the using of sand instead of mortar had been in his mind with reference to my clients, it is not at all likely that he would have given them the excellent character he did. Another witness, Henry, has said that inferior stone was used upon Contract 118. Mr. Millner, the supervising engineer on that contract, has given a most distinct and emphatic denial to Henry's testimony. He says that the man must have been in error when he stated that inferior stone was used on any part of the contract. I come again to Dawson, and I approach this part of the case with some little difficulty, because it is irksome and distasteful to most men, I think, to make public reference to the actions of another man, which they know to be distinctly and absolutely immoral. In regard to Dawson, I have no hesitation in saying that, for his own purposes, for his own ends—in order that he might have what he considered a hold over this firm of contractors—he deliberately and maliciously left certain holes in the brickwork at North Shore. I say that that was done by him maliciously and deliberately. The North Shore contract, upon which this defective work was done, was inspected by Mr. McCredie. His evidence goes to show that in no places except those pointed out by Dawson could he find any trace or indication of bad packing. Wherever Dawson said there was bad packing, there, surely enough, he found it. We had, at a later stage, the evidence of Hart and King, who told us that sometime in September last Dawson told them that he would make it very hot—damned hot, he is reported to have said—for my clients if they did not constantly employ him. I would, in this connection, direct your Honor's attention to the fact that it was somewhere between the 24th and 26th of September last that Mr. Parkes made one of his speeches in the House.

*Mr. Parkes :* I think you will find that the questions were asked at that time, and that the speech was delivered in October.

*Mr. Andrews :* According to *Hansard* the speech was delivered on 26th September, 1895, and at some time thereabouts Dawson, for some reason of his own, told Hart and King what he intended to do if he did not get his own way with these contractors. After that, somewhere about December or January, we have this defective work done, and I put it to your Honor, that it is clear beyond all doubt that the work was done for the purpose, and in the manner, I have stated—that it was done deliberately for Dawson's own purposes. The man himself has admitted that the contractors never asked him to do the work. As I said before, he stated that it may have been done with the cognisance and at the request of Reid, the manager. That statement, however, Reid has absolutely denied. Subsequently Dawson met a man named Booth, and he told him that he had "readied it up for the contractors," or used words to that effect. Then he came here and gave his evidence, for what reason we are not in a position to say. He told your Honor that his conscience had pricked him ; but it must be borne in mind that his accommodating conscience did not make itself unbearable until he had left the employment of the firm—until after he had done this disgraceful work. His conscience only became rebellious when he found that the contractors would not submit to his attempts to blackmail them. I submit that the evidence of King, Page, Booth, and Hart is quite enough, taken in conjunction with the surrounding circumstances, to convict Dawson of his malicious intention. Dawson himself admits that he may have mentioned the matter to Mrs. Hart ; and we have another witness swearing that Dawson told him that he had "readied things up for the contractors." Let me refer your Honor to what Dawson says in reply to Questions 6772 and 6773. He was just afterwards asked whether he ever said anything to a man named King, and he said that King might have been in the house at the time, but that he was not "in the company." Dawson practically admitted, your Honor will see, that he left these holes deliberately, and there can be no doubt, in the mind of any unprejudiced person, that he left them simply for the purpose of blackmailing the contractors. To show your Honor what a thoroughly unreliable man he is I will refer you to the evidence he gave with regard to what he called defective packing at Emily-street on the Marrickville contract. He said that the sewer there, instead of being packed with concrete, was packed with shale, and that he supposed the contractors were paid for packing with concrete, that having been approved by the Engineer-in-Chief. Mr. Griffiths has proved that the packing in shale was done at his own request, as he considered that packing with shale, when the excavation was through shale, was better than concrete packing. Dawson assumes not only that the officers of the department could not see that the sewer was packed with shale, but that the contractors must have so packed it with the deliberate intention of charging for the shale packing as concrete, in this way defrauding the Government of money. This same man also said something with regard to some condemned bagged cement being brought in casks from a shed on Contract 118 and used in the work on that contract. It has been proved by Inspector Clymer, and by the person who sent this cement to the board, that it was not condemned cement. I think it was the witness Kady who explained why that particular cement was transferred from the bags to the casks in the manner described by Dawson. I do not think I need say anything more with regard to this fraudulent

fraudulent workman. Your Honor has seen him. You have heard his evidence, and you have heard what has been said by other witnesses. I may point out that these contractors, within the last six or seven years, have carried out Government works to the extent of over a quarter of a million of money. Notwithstanding that, the only evidence of defective work on the part of their workmen which has been brought before the Commission is in relation to these holes at North Shore; that, in another place, there may have been a foot of stone instead of concrete at the bottom of a sump, and that, according to Darcus, some five or six batches of inferior concrete were mixed. Taking the extreme value of the saving effected by this defective work, what does it amount to? What would the contractors have gained by allowing this work to be done, supposing it to have been done with their knowledge? At the most they would not have saved £50, and it is absurd to suppose that this firm of contractors, who carried out public works to the value of a quarter of a million of money, would sacrifice their reputation and would tarnish their honor for a paltry sum of £50. Of course it may be said, as Mr. Parkes interjected on one occasion whilst evidence was being given, that when once contractors have been caught doing bad work they may be supposed to have done it generally. But we are not here, and I submit that your Honor will not find it your duty, to go outside of the evidence which has been given. If defective work has been done, it must be proved in the ordinary and proper way. It is not to be supposed because, one man, who, for his own purposes, has deliberately done defective work, comes here and swears that he did that work for his own purposes, that the whole or a great portion of the work in these sewerage contracts is defective. Mr. McCredie, after making a thorough inspection of two of the contracts, said that had he been the supervising engineer he would have passed the whole of the work, as far as he could see, with the exception of the holes of which he spoke, and which appeared to him to have been deliberately left. With that exception he said that the whole of the work appeared to him to have been well and faithfully performed. So much for the direct evidence upon the question of defective work. That brings me to the question of what may be called implied defective work. I take it that the evidence which has been given before this Commission as to the quantity of cement which would be required to carry out various contracts has been given with the idea of proving that there was defective work by reason of the specified quantity of material not having been put into it. I think your Honor will agree with me that we have had unquestionable evidence that the bulking of concrete varies in different circumstances—that hardly any two batches of concrete will make, when put into position, the same quantity of work. The Department, in their wisdom, have seen fit to establish a rule founded upon the experience which they have gained from the time these sewerage contracts were first undertaken up to the present time—a period of many years. What do the Department say? They say, from the experience of years, and not from the results of one or two tests made, nobody knows where and when, that sandstone concrete will bulk 27 feet, and that bluestone concrete will bulk 22 feet. Taking that basis, the Department have proved that, upon certain contracts, viz., 69, 79, and 79A, the quantity required to be used would be 15,606 casks. The inspectors' returns, in respect of those contracts—and they have been in no way disputed—show that the quantity actually used was 15,619 casks, or a quantity slightly in excess of the estimate of the Department. Mr. Christie, in one of his valuable reports, has shown that the contractors purchased for these particular jobs 13,431 casks of cement. It has been proved by the evidence of Burcombe that he himself carted from Contract 72, the Alexandria contract, to North Shore at least 2,000 casks; and that during the time he was carrying this cement other carters were also carrying some. If that be so, at least 2,200 casks must have been taken over from the Alexandria contract to North Shore, which would give a total of 15,631 casks, or an excess of about twenty casks upon the estimate, so far as these contracts are concerned. If your Honor believes the Departmental evidence—and no attempt has been made to gainsay it—you can arrive at only one conclusion, and that is, that the proper quantity of cement was used upon each of these three contracts. Furthermore, Mr. Greenwood, Mr. Spencer, Mr. Eaton, and other contractors, have shown that they have been paid upon the basis adopted by the Department. Mr. Gilliver said that upon some of his contracts he had been paid for sandstone concrete at as high a rate as 30 feet, and that he had often been paid at the rate of 28 feet. Mr. Christie leaves the matter at the point that I have indicated, showing from his standpoint a very large deficiency. But the Department have gone a step further, and they have shown to the Commission the quantity of cement required to be used upon the whole of the contracts carried out by this firm of contractors. When I say this firm of contractors, I mean Carter & Co., and Carter, Gummow, & Co.; because some of the contracts were those of Carter & Co. only. The Department has shown that the quantity of cement required for the whole of the work done by this firm was 44,740 casks, whereas the inspectors' returns show that the quantity used was 44,630. Mr. Carter, in his evidence the other day, swore absolutely that from the time he first commenced as a contractor up to the present time he had purchased about 48,000 casks, and that he had no doubt sold a certain quantity to other contractors. It has been shown, however, that he need not have purchased more than 44,700 casks to carry out the work in these various contracts; that would be sufficient to provide material for all classes of work required from the starting of these contracts up to

the present time. If that be true then a lot of this talk about the heaping up of metal and sand is so much idle tittle tattle. In this connection I would also refer your Honor to the evidence of Mr. Griffiths, who until lately had charge of the Water and Sewerage Board's works. He supports Mr. Davis by saying that when he makes an estimate of the work to be performed for that particular branch he proceeds upon the basis of 22 feet of bluestone concrete and of 27 feet in the case of sandstone concrete. I do not think I need labour this part of the case any more. I think we have unmistakeable proof that there has been no defective work whatever so far as my clients are concerned; that they have supplied for the whole of their contracts a proper and legitimate quantity of cement. The next point I propose to touch upon has reference to the sureties for Contract 77. From our point of view the only persons who have any connection with or responsibility to the Government are those who absolutely sign the contract. They are the only persons the Government can recognise, and, looking at the matter from that point of view, it does not matter whether Mr. Forrest and Mr. Gillan were partners a hundred times over. The Government would not in any way recognise them. It may be that as a dry matter of law these gentlemen were partners in this particular contract. It is doubtful to my mind whether they were or not; but assuming that they were partners at the time that bond was entered into, it has always been considered by us that the only persons with whom the Government had to do were Mr. Carter, Mr. Gummow, and Mr. Snodgrass. They had that fact in their mind, and knew that it was not reasonable to ask any person who took this enormous risk—for it is an enormous risk to become responsible for £6,000, the responsibility being continued for three years after the completion of the works—to do so, except upon some consideration; otherwise it would not be a fair and businesslike transaction. It could not be expected that any person who had not some interest in the firm would take up that position. We know that it is a most common arrangement to make when persons become sureties, that they shall receive a proportion of the profits by way of interest for the risk they have taken. That has been proved in many cases in the Supreme Court, and no doubt it has occurred in many cases which have come under your Honor's judicial notice. Under these circumstances the contractors submitted these names to the Department in a perfectly honest and *bonâ fide* manner, and the Department not knowing, as they said—and there can be no doubt I submit on that point—that these gentlemen were partners in this particular transaction, accepted the names. Mr. Christie, in one of his reports, endeavoured to make it appear to this Commission that these gentlemen were not worth the amount they said they were worth, but I submit that the question is whether they were worth £6,000, not when the matter was investigated by Mr. Christie, or according to the recent valuation of a well known auctioneer; the question is whether they did honestly believe at the time they made their declaration that they were each in a position to pay £6,000 if this job should fail. I think your Honor will agree with me that both of these gentlemen who have been before the Commission gave their evidence in a straightforward manner. They tell us that they considered at the time they entered into the bond, notwithstanding what may have been said to this Commission, that they were worth £6,000. There seems to have been some little confusion as to the position of Mr. Forrest's property in New Zealand. How that arose we are not in a position to say; but Mr. Forrest has produced accounts which he has received from his agent in New Zealand, which show unmistakably that the evidence he first gave, notwithstanding the report from the Land and Income-tax Department in New Zealand, was true—that is to say that he owned this property. There may have been a little confusion as to the exact position of matters.

*His Honor*: It all depends upon the will of Mrs. Forrest, I think. There has been a mistake which Mr. Forrest has explained. It is clear enough now how the misunderstanding arose.

*Mr. Andrews*: The facts were, I think, that the property stood in Mrs. Forrest's name, and that that circumstance was overlooked. It appears that she died, leaving the property to Mr. Forrest. Some comment has been made upon the circumstance of one of these gentlemen swearing that he was possessed of real and personal estate when he was not in a position to show that he had any real estate. I suppose I have had as extensive a practice as has any man in Sydney in getting documents signed, and I find that, as a rule, there is no difficulty in getting persons to sign documents if they are satisfied that they are substantially correct, and without going into the details of them; and I put it to your Honor that Mr. Gillan, at the time he made that declaration in which the words "real estate" occur, had this main fact in his mind—that he was worth £6,000. He was told that he had to make a declaration that he was worth that amount, and it did not perhaps strike him that real estate has the very definite meaning in law which it has. There is another peculiar circumstance in connection with Mr. Gillan's declaration, and that is another misconception which I find, from my own practice, often exists. Some men are too apt to think that houses which belong to their wives belong to them, and, perhaps for all practical purposes, they do. If Mr. Gillan, in making the declaration, thought of real estate at all—and it seems improbable that he did so—this circumstance must have slipped his memory. The house has been always talked of as his house, and he had always received the rent. It is quite conceivable, therefore, that he came to regard it

as his own property, although, from a legal point of view, it was his wife's. Quite independently of the question, however, whether this house was his own property or not, he was worth £6,000, and it is quite evident, to my mind, that he was unconscious of the term "real estate" being used in the declaration. Another point to which it is well, perhaps, that I should direct your Honor's attention is the position of Bond and Hudson in regard to one of these contracts. The facts gleaned from the evidence upon this point would seem to show that Bond and Hudson were originally the lowest tenderers for Contract 79. Prior to tendering for that contract, they had tendered for, and, indeed, were the lowest tenderers for, a job at Woolloomooloo. When they found that they were the lowest tenderers for the Woolloomooloo job, they, after considerable delay, refused to go on with it. Carter & Co. had a large stock of plant lying idle, and, rightly or wrongly, they conceived that it would be a good business transaction on their part—and it is certainly not an unusual one—if, in the case of Contract 79, instead of having to contend with a considerable delay and the final throwing up of the contract by Bond and Hudson, they induced that firm to withdraw from the contract upon the payment to them of a certain sum of money. This may be wrong from several points of view. Some persons may go so far as to say that it was morally wrong; but your Honor does not need me to tell you that a similar case is taken every day in connection with nearly every class of business. Hardly one large sale takes place in connection with which some such transaction does not occur. There is hardly an instance in which there are monetary transactions between business men in which it is not usual for persons to make an endeavour to remove competition at some small cost to themselves. My clients think that, if Bond and Hudson had gone on for some time and had eventually thrown up the job, they—my clients—would have been put in a very bad position, because their prices would have been known to the rest of the contractors, and in the process of re-tendering, some other contractor might—from a knowledge of those prices—contrive to just slip underneath them and deprive them of their legitimate rights. Assuming that Bond and Hudson had not been the lowest tenderers, my clients would have obtained the job on the first tendering. The peculiarity of the thing is that Carter & Co., when the Woolloomooloo job was re-tendered, cut out Gummow and Gillan. Both Carter & Co. and Gummow and Gillan, as your Honor will see from their joint protest, felt very sore that they should be called upon to re-tender for works after their figures had once been made known to the public. With regard to the concessions which are alleged to have been made to my clients, there are one or two matters which have not been emphasised by Mr. Smith, I think, as they might have been. It has been put forward, for instance, that the granting to the firm of Carter & Co. of the High-street and Ernest-street extensions at North Shore were concessions which the department should not have made to this particular firm. I do not think I need do more than refer your Honor to Mr. Davis' report upon page 509, showing how the giving of these small extensions to the firm—they were really part of the reticulation from the main sewer—came about. It will be seen that it was a matter of economy to the department as well as a saving of time. As one witness put it, it prevented injury to the sewer, which, if these particular contractors had not carried out the extensions, would have had to be tapped to permit of the extensions being made. With reference to the concessions in respect of Contract 69, Mr. Smith has gone very fully into that matter. All I need add to what he has said is this—that all the contractors who at that time accepted payment in Funded Stock were treated in exactly the same way as were Carter, Gummow, & Co.—that is to say, instead of giving a cash deposit they were allowed to find sureties for the due fulfilment of the work. Mr. Davis has handed in a list showing various contracts in the Department of Public Works which were let upon that basis. As to the rigging of the schedule in connection with this particular contract, I do not think that anything I could say would carry greater conviction to your Honor's mind than would the evidence of Mr. Gummow. He has explained fully the manner in which the schedule was made up. With regard to the Shea's Creek contract, Mr. Parkes, in his speech of 12th May last, asserted that the contractors were not only paid for the work they did, but that, on a portion of the work being washed out by flood water, they were paid for filling it up again. Mr. Parkes used these words—

I was told, and I believe it to be true owing to the authority from which it comes, that the Government officer has not only paid them for the work they did, but paid them for all the flood water washed out, and then paid them to fill it up again.

With regard to that allegation, I submit that not one iota of evidence has been forthcoming in support of it. I do not think, therefore, that I need address your Honor in regard to it. Coming to Contract 79A, I think it has been clearly demonstrated to your Honor that, so far as the giving of that contract to my clients was concerned, it was not a concession, but was a good business arrangement on the part of the department. The officers of the department were in no way responsible for it. Mr. Lyne, the Secretary for Public Works at that time, both in Parliament and before your Honor, has pointed out that he is prepared to take the entire responsibility for the letting of 79A without tender. I come now to deal with an entirely different matter—I mean some of the reports which have been made by Mr. Christie. If these reports mean anything, they mean that the financial position of my clients was, at least, unsound. If the reports do

not



not mean that, then all I can say is that Mr. Christie appears to have gone to an immense amount of labour in order to prove nothing. If he means only to insinuate that this firm, who at that time were carrying out various works—one job alone being worth £98,000—could do with money at a cheap rate, then his labour seems to have been wasted, because the proposition is so manifest that Mr. Christie certainly need not have taken pains to elaborate it. If, on the other hand, his reports mean, as I say they are intended to mean, that my clients were not in a sound position financially, then I say that, to that extent, they are disgraceful productions to emanate from a man who professes to be an accountant. One of these reports, which has been read to your Honor, shows that there was an amount of £2,000 of which Mr. Christie must have known at that particular time, and about which he says not a word in his report. That is the way in which we have been met before this Commission. Why should Mr. Christie completely ignore assets of the firm represented by this comparatively large sum of money? He must have known that the firm were at that time in possession of a very large quantity of plant, and that the Government of this Colony was indebted to them in a large sum of money. He must also have known, if he had taken the trouble to inquire—as he did take trouble in regard to every circumstance which could possibly tell against us—that the Government of South Australia at that particular time must have owed my clients nearly £10,000. Mr. Parkes, himself, protests now, I understand, that it was not the intention of any one of Mr. Christie's reports to show that the firm was not in a sound financial position. If that be so, perhaps Mr. Parkes, when he addresses your Honor, will have the goodness to explain what the intention of the particular report to which I refer was. I do say, with all respect to your Honor, that it is a pity that Mr. Christie should have been permitted to send broadcast over this country statements which he must have known were not true. Mr. Parkes, for some reason which is best known to himself, has insinuated that the £3,000 which was paid to Mr. Maddison and Mr. Ewing, respectively, was composed entirely of profits made by them upon the undertakings of the firm over and above the monthly allowance drawn by them as members of the firm. The insinuation is that this large amount of profit was made in respect of one contract, No. 69. Let me point out to your Honor, first of all, that of this amount the sum of £2,000 has been proved to consist of the return to Mr. Maddison and Mr. Ewing of their share of the capital which was put into the firm, and that the £1,000 remaining represents profit extending over Contracts 79A and 69, and also the Adelaide contract, which contract alone was worth £98,000. If, in respect of these three contracts, this firm of contractors cannot make a greater proportionate profit than that, I think it is quite conclusive that they cannot have engaged in the systematic defective work with which they are charged by Mr. Parkes, and that they cannot have received from the Government the concessions which they are alleged to have received. Mr. Gummow has sworn that at the particular time to which Mr. Christie refers the company was in an absolutely sound position, and that he was then, as he is now—if necessity should arise—willing to find a further sum of £5,000 for the benefit of the concern. That being so, what importance can be attached to Mr. Christie's investigations? They mean either what I say or they mean nothing. The only other point to which I intend to address myself relates to Mr. Hickson, junior. Mr. Christie has devoted an immense amount of labour, and no little time, and, from his point of view, I have no doubt, considerable ability, to the elucidation of various matters for the information of this Commission, and particularly to the investigation of the affairs of my clients. I take it that we should have had a very elaborate report from him had he been able to show that a single penny beyond his salary, and the small bonus of which we have heard, had ever been paid to Mr. Hickson, junior, by the firm. Mr. Christie has not only had access to the bank books of the firm, but he has had access to the private banking accounts of the different members of the firm. He has also had the benefit of a search through the private banking accounts of Mr. Hickson, senior, of Mr. Davis, of Mr. Hickson, junior, and of other persons. Notwithstanding the whole of these facilities at his disposal, he has not been able to trace—simply because it is not traceable—the payment to this young man by this particular firm of anything beyond his salary and the small bonus referred to in the evidence. It has been proved, beyond doubt, that when he was employed by this firm of contractors in Sydney he had at no time during that employment any business transactions whatever with the department. I do not think I need argue that matter any further. I join with Mr. Smith in regretting that Mr. Parkes, as a Member of the Legislative Assembly of New South Wales, as a public man upon whom are cast duties as well as privileges, should have been so grievously misled by the idle and, to some extent, malicious talk of disappointed contractors, and by the tittle-tattle of workmen, into the making of such serious charges against gentlemen who have administered various branches of the Department of Public Works for some years with honor to themselves and with profit to the country, and that he should have dragged before the world the affairs of the firm of Carter, Gummow, & Co., disclosing—not that my clients are ashamed at the disclosure—their whole business transactions, and exposing them to the broad light of day. My clients feel, within themselves, that they have been guilty of nothing which cannot be subjected to the most minute investigation, and they also feel it very deeply that Mr. Parkes, by listening to tittle-tattle, should have cast upon them such an enormous expense, combined with so much anxiety and trouble, the whole of which might have been avoided if Mr. Parkes had taken even ordinary precautions to ascertain whether the rumours and insinuations which reached him had any foundation whatever in fact.

[Extract

[Extract from *Hansard*, 26th September, 1895.]

Mr. V. PARKES (Canterbury): I bring this matter before the House in this form because it is necessary, in view of the fact that it is impossible to get an ordinary notice of motion placed so as to have it carried. During last Parliament I made every possible effort to have a motion carried which would insure a complete inquiry into the contract system of this Colony. That motion was opposed by the Secretary for Public Works as a vote of censure upon his administration of the department. It was therefore impossible for me to go on with my motion, because it would be inevitably defeated. I tried many other means of obtaining an insight into the methods of Government contracts, but I found that was also impossible to accomplish. You may make what representations you like to public officers and ministers, but they are referred to the public officers, and you can never get a truthful answer from those departments. I have made inquiries time after time since I have been a member of Parliament, in order to get an idea approximately of the position in which we stand with regard to these contracts, but you can get no truth whatever. I have taken that trouble, since I first gave notice of the motion to which I have referred up to the present time, in order to follow out some case which would allow me at least to place before Parliament the real reason why there is a necessity for an inquiry into the working of our public contracts. I first want to point out that this contracting in vast sums of public money must be conducted with the greatest purity possible, with the greatest equity, and with the greatest amount of daylight let into it which is possible. Unless it is regulated upon some proper principle, no contractors of any repute will feel secure in sending their tenders to the Government. When contractors tender for large public works they have to go to great expense in preparing their tenders. They will not do that if they have the slightest suspicion that there is favouritism shown by the officers of the department to any special contractors. You cannot get open tendering and the freest competition if there is a shadow of doubt that the utmost equity will be exercised in giving the contract to contractors according to their tenders. The case which I am about to cite will illustrate the position I take up. There is a set of contractors whose names or titles are Messrs. Carter, Gummow, & Co. They contract for various works in this country—at present most of them are about Sydney. This firm of contractors are identified with the Government in the most suspicious fashion. During last week, or the week before, I asked the Secretary for Public Works whether Messrs. Gillan and Forrest were not sureties for the proper fulfilment of the contracts of this firm of Carter, Gummow, & Co. The reply I got was that Messrs. Gillan and Forrest were the sureties for those contractors. I wish hon. members to closely follow this matter. What I am about to read is a notice which appeared in the *Sydney Morning Herald* on the 13th of this month—that is, last Friday week—not very long ago. The notice shows that a dissolution of partnership took place, and that the very sureties for Carter, Gummow, & Co.—Messrs. Gillan and Forrest—are members of this business. The following is the notice:—

Notice is hereby given that the partnership lately subsisting between us, the undersigned, John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing, as contractors, carrying on business in Adelaide (South Australia) and Sydney (New South Wales) under the name, style, or firm of Carter, Gummow, & Co., was on the first day of April, 1895, dissolved by mutual consent in so far as regards the said George Maddison and Peter Ewing, who retired as from that date from the said firm. All debts due or owing by the said firm will be received and paid by the said John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, and James Gillan, who continue the business under the same style of Carter, Gummow, & Co.

As witness our hands this 1st day of April, A.D. 1895.

|          |                  |                  |
|----------|------------------|------------------|
| (Signed) | F. M. GUMMOW.    | GEORGE FORREST.  |
|          | JOHN CARTER.     | GEORGE MADDISON. |
|          | D. G. SNODGRASS. | PETER EWING.     |
|          | JAMES GILLAN.    |                  |

That is a nice state of affairs. I wish to point it out to hon. members, if they do not quite realise it. If the Government accept sureties consisting of persons who are members of the firm of contractors, supposing the contractors go insolvent, or cheat the Government by defective work, suppose they enter into fraud to defeat the Government in large contracts of £30,000 or £50,000, what check is there upon them? The very specification which the Government issue makes it imperative that these sureties shall be disinterested persons altogether. The object of having sureties is to have men of means at the back of the contractors, so that if anything goes wrong—if the contractors go insolvent, or defraud the Government, if they carry out bad work, the Government can come down upon the sureties. But here is a case where these contracts total nearly £100,000, with sureties of their own partnership. This is a nice state of affairs. I wish to go further, and to show that there has seldom been a case, taking it in this way, in which any private business would offer to give away contracts to the extent of £20,000, without offering them to competition and to tender. No private individual would ever dream of going into such a business transaction such as that. Yet this firm of contractors, Messrs. Carter, Gummow, & Co., have received between £45,000 and £50,000 of Government contracts without any tender. Not that there were no contractors to tender, because we know that at the present time of dearth of employment there were any number of contractors to tender, in order to keep their plant from being idle. They were willing to tender for the smallest work possible; yet this work is given out without tender to this special firm of contractors. I asked the Secretary for Public Works last week what connection Mr. Hickson had with the firm and with this work. I was told that Mr. Hickson was the engineer to these contractors; but I am informed, upon the most reliable authority, that of a Mr. Maddison, the contractor who has left this firm, that Mr. Hickson took the position as a partner in the firm, he being a son of the Engineer-in-Chief. Now, it is an unfortunate position that this firm should have been allowed contracts under such circumstances as these; their engineer having to communicate with his father, who is in a position in the Public Works Department, in which he could grant all sorts of concessions. This firm are the only contractors who during the last twelve months have received these numerous concessions. I have it upon the authority of Mr. Maddison, who has undertaken to produce a copy of the telegram, that a wire was sent in March, 1894, by one of this firm of contractors, Mr. Carter, to another member of the firm, Mr. Gummow, who was then in South Australia, to this effect: "Mr. Hickson must be taken into the firm at any cost." It was about this time that Mr. Hickson left the department, as his father said, on the score of retrenchment, and took up his position as an alleged partner in this firm; or, as I have been informed by the Minister, their chief engineer.

Mr. GARRARD: Has the hon. gentleman the telegram?

Mr.

**Mr. V. PARKES:** The retiring partner assures me that he will produce a copy of the telegram. If it is not forthcoming a copy can be obtained from the Telegraph Department. He is willing to make a statement on oath, however, that this thing occurred. Having established this connection between the Engineer-in-Chief's son and the firm, I intend, presently, to show what concessions were given to these contractors. In the first place they competed for some sewerage works which were going on at Balmain. Hon. members are well aware that these contracts are tendered for nowadays at schedule prices, that is to say, quantities are taken out and the Government officers place schedule prices upon each of the items. Fifteen firms of contractors tendered for the works at Balmain at schedule prices, and the lowest tenderer was the firm of Messrs. Carter, Gummow, and Co. These contractors sent in a price ridiculously low as compared with the fourteen other firms tendering. Their tender was 28½ per cent. under the schedule prices. The next was 18½ per cent. After their tender was accepted, and after they were notified of the acceptance, they were enabled to place plans in the department for the carrying out of the work upon an entirely new plan, called the Monier system. The other contractors had no opportunity of competing with the firm for the carrying out of the work upon this system. I am assured by other contractors that whereas Messrs. Carter, Gummow, & Co. obtained a contract at £15,500, they would have been willing to carry out the job at £12,500 to £13,200, effecting a saving of from £2,300 to £3,000. Under the schedule prices of which I have spoken there is one item put down for brickwork and cement arches, 2,020 yards, at £2 10s. a yard. That was substituted under the Monier system by sandstone and concrete, put down at £1 8s. per cubic yard. There was that difference in the prices for the 2,020 yards. On that item alone a concession of £1,650 was made to these contractors. Hon. members will see that when such concessions are allowed, other contractors must be quite within the mark in saying that if they had had the opportunity they could have carried out the job at a figure from £2,300 to £3,000 below that paid to this particular firm. The Monier system is one which is specially recommended on account of its cheapness and lightness, and there would have been no object in adopting it unless on account of its economical character. I do not at all blame the Secretary for Public Works in this matter; we know him to be a gentleman of the strictest integrity; but there can be no doubt that the Engineer-in-Chief and the Under Secretary for Public Works have led him into various mistakes. The greatest mistake into which he has been led was that of putting Mr. Hickson in the position of Engineer-in-Chief and putting out of the department a man infinitely his superior—I mean Mr. Darley—to take charge of the Water and Sewerage Board.

**Mr. YOUNG:** He agreed with the recommendation!

**Mr. V. PARKES:** Of late years he has done almost anything that the Engineer-in-Chief asked him to do. There can be no doubt that as an engineer he is infinitely superior to Mr. Hickson. The Secretary for Public Works, I find, made a query upon the report of the Board of Reference.

**Mr. YOUNG:** Read it!

**Mr. V. PARKES:**

The tenders for this work were submitted to the Board to-day. In doing so, Mr. Hickson pointed out that fifteen tenders had been received, the lowest being that of Carter, Gummow, & Co., at 28½ per cent. below schedule rates, amounting approximately to £15,757 ls. 9d. The same firm also submitted a lump sum tender for carrying out the work according to a plan sent in by them for the sum of £15,500. The plan submitted is for constructing the work on the Monier arch principle. This system has been extensively used during recent years on the continent of Europe with successful results, and Mr. Hickson sees no reason why, under certain restrictions, the opportunity should not be taken to introduce the system into the public works of this Colony. The advantages claimed by the patentees are that works can be carried out at a much cheaper rate wherever this method of construction is used. Mr. Hickson said he had no doubt that the design submitted was thoroughly suitable and likely to be effective; and, as the main principles as regards size and inclination of sewer were as provided for in the departmental design, he was prepared to recommend it for adoption; but if it was decided to accept the tender, a short specification of the work should be included in the bond, and provision also made for the maintenance of the work by the contractors for a certain period after completion.

Mr. Hickson further said that, as Mr. Darley would be the responsible officer for carrying out this work, he had gone into the matter very thoroughly with that gentleman, and Mr. Darley was quite prepared to indorse his views.

The Board, in view of the fact that Messrs. Darley and Hickson are satisfied that the principle is a sound one, and that the adoption of the plan will result in considerable economy, are prepared to indorse the recommendation of these gentlemen, and now submit the matter for the Minister's consideration.

The Board having, in support of the Engineer-in-Chief and the President of the Water Supply and Sewerage Board, agreed to substitute this system, the Secretary for Public Works wrote a businesslike minute, for which I give him credit:

Before approving this proposal, I should like an estimate of the actual value of the work to be carried out by the contractor under the substituted scheme.

That is a very wise minute. The hon. gentleman expressed a desire for schedule rates under the Monier system corresponding with those which had been furnished in the case of the ordinary sewerage works. One would have imagined that there would be no trouble in getting out that schedule; but the Engineer-in-Chief said:

To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do.

What did that slight loss of time matter when it would be two months before the contractors could start the contract;—why should not the quantities have been taken out? The sole reason was that quantities so much less would have been shown, and instead of the contractors making a profit of £2,000, they would have been cut down to a proper estimate of the value of the work.

I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm, estimates were made for the work on the Monier system as well as on the department's designs. The result was that the estimate of both works was practically the same. Applying that comparison to this case, it would mean that the departmental estimate for the work under consideration would be £22,000.

You cannot make a comparison between two different public works of this kind. The duty of the head of the department when a Minister asked him for a further sheet of quantities was to make them out, and the Minister ought to have insisted upon that being done; but he said in effect that the Engineer's reply was quite sufficient for him, and that he should approve of the recommendation of the Board being carried out. There is no reason why the head of the department should not have had a new estimate taken out for an entirely new piece of work. So much for the case of the Balmain sewerage works. I think I have clearly proved that a concession was made to this firm by which the country lost a considerable sum of money. If the work had been properly tendered for there would no doubt have been a saving of at least £2,500. I will now deal with another contract. The same firm within the last eighteen months received a contract for sewerage works at North Shore. They received their contract

Under

under a schedule tender, and their sureties as usual were those of their own firm. No query is made as to whether they are in a good financial state or as to whether they can provide good disinterested sureties. After they had received the first contract the member for the district, no doubt with the best intentions and with the object of finding work for the unemployed, recommended that a certain extension should be carried out. The Engineer-in-Chief reported that as a matter of urgency certain extensions to the contract should be carried out along various streets. How is it possible that the work could have been urgent seeing that the outlet into the ocean for the whole of the sewerage scheme has not even been taken in hand? Until the outlet had been completed, how could the urgency of constructing branch lines of sewerage arise? Without any contract tendering, without any preparation of plans, without an effort to save the country unnecessary expenditure, a contract of £35,000 was given to this firm without competition for this extension work. It is no wonder that the contractors of the city complain of this contract being given. In connection with this contract, I wish to point out that the Engineer-in-Chief, upon the 22nd March, 1894, wrote this minute:—

There is no reason why this extension should not be gone on with at once. I cannot, however, see my way to recommend that it be carried out as an extension of the existing contract, which, at schedule rates, would amount to £16,307 17s. 8d., whereas the office estimate is £12,831 19s. 6d. The greater part of this difference lies in one item, "excavations in shafts," which in present contract, owing to their great depth, carries a very high price, namely, 78s. per cubic yard. This, Messrs. Carter & Co. are prepared to reduce to 40s. per cubic yard, which would reduce the total cost to £13,700, or about £1,000 above the office estimate. I believe, however, if tenders were invited, we could get the work done under the office estimate.—R.R.P.H., 22/3/94.

It was about this time that Mr. Hickson, junior, became a member of the firm. I find this minute by the Engineer-in-Chief on the 29th of the same month:—

Referring to the Minister's intimation this morning, that he was prepared to let Messrs. Carter & Co. carry out this work as an extension of their present contract, provided they agreed to do so for the departmental estimate of £12,831 19s. 6d., no claims whatsoever to be made for extras, and all payments to be made at the allowed schedule rates.—

That means that they might be allowed as extras—

I have had an interview with Mr. Carter, who is prepared, on the part of his firm, to comply with the Minister's decision. Submitted for formal approval.—R.R.P.H., 29/3/94.

This was on the 30th March, 1894. How sudden a change! It is not the Minister who has to do with this. The Minister is generally led by the head of the department, it does not matter whether it is the present or the last Minister. The heads of these departments ought to be above reproach. There ought to be the greatest possible check put upon them. When we see a rapid change like this in a minute in a few days, after a son of the gentleman concerned has taken office under the contractors, then there is some suspicion. It is impossible to make definite charges, but the case looks so grave that it ought to be filtered out in this House.

Mr. YOUNG: Does the hon. gentleman assert that the engagement of young Mr. Hickson took place in the meantime—during those two or three days?

Mr. V. PARKES: I believe it was during that time.

Mr. YOUNG: Does the hon. member assert that?

Mr. V. PARKES: I believe it was. This circumstance shows the imperative necessity of holding an inquiry into the system of letting out public contracts with the view of establishing some method of check of which the country would get the benefit. Because if you look right through the history of public contracting, what do you see? Nothing but uprootings of corruption. Where we start railways we find them ending at double their original cost; where we start other works, we find that often bad material is put in, and the country is robbed right and left. This state of things will continue so long as we allow the present system to exist. If the Minister will grant me the committee I ask for to investigate these cases, I will undertake to establish a method by which we can easily get over these difficulties. Now, let me take another instance. These gentlemen have a contract at Johnstone's Bay for what they call storm-water channelling. This storm-water channelling is taken through a lot of mud flats. For four or five weeks the Government employed about forty or fifty of the unemployed to drain the water off this land for the contractors. The Government actually employed the unemployed for this purpose. I can bring plenty of evidence, on oath, that forty or fifty men were employed for four or five weeks draining the water off the land where these gentlemen had to carry out their contract. The effect of that was to put £280 or £300 into the pockets of the contractors. I could cite other concessions given to these gentlemen, information as to which has been given to me not by one contractor, but by twelve or fourteen. Innumerable concessions have been given to them, and it would only be wearying the House to particularise them.

Mr. YOUNG: Let us have them all while the hon. member is about it!

Mr. V. PARKES: If an inquiry is made, the House will find that there has been an undue amount of favouritism towards not only these contractors but many others.

Mr. LYNE: I should like the hon. gentleman to state more definitely when that Johnstone's Bay work took place, and what the work was?

Mr. V. PARKES: Owing to the difficulty of obtaining returns, I cannot at the present moment give the hon. member the information.

Mr. GARRARD: It took place about two months ago.

Mr. V. PARKES: The contract, as far as I know, is about two-thirds of the way towards completion, and the work has been very carefully prepared at the expense of the Government so as to facilitate the carrying out of the contract—after the contract was let, and not before. An hon. member of this House went to the trouble of looking through the evidence given by the Engineer-in-Chief before the Public Works Committee on the Pymont Bridge scheme, and, if I mistake not, he spent about 45 minutes of the time of the House in explaining the inconsistencies of the evidence given by that gentleman. The evidence was so inconsistent and so varying that, having been given on oath, it almost amounts to perjury. If any hon. member will take the trouble to look through the evidence taken before the Public Works Committee in reference to the Pymont Bridge, he will see that the statements made by this officer were contradictory from beginning to end, exhibiting on his part a want of knowledge of his business. To show the artifice with which questions are answered by the Engineer-in-Chief, on the 19th instant I asked these simple questions of the Minister:—

(7.) What connection has a Mr. Hickson with this firm or with the works? (8.) Is this Mr. Hickson a son of the present Engineer-in-Chief?

This

This was the reply :—

(7.) He is engineer to the contractors. (8.) He is the son of the Engineer-in-Chief for Public Works ; but the Balmain contract referred to is being carried out under the supervision of the President of the Water and Sewerage Board and Engineer-in-Chief for Sewerage Construction, Mr. Darley.

Now, Mr. Darley has only been appointed to his present position about two months, and during all the time that this contract was being carried out it was under the Engineer-in-Chief.

Mr. YOUNG : No.

Mr. V. PARKES : The Engineer-in-Chief was the chief designer of it, and the contract was not carried out under Mr. Darley. I made sure of that fact. The answer I have quoted is a subterfuge. The question ought to have been answered by a simple "yes" or "no." The answer contains a misleading statement. The blame of employing these gentlemen has been put upon Mr. Darley. The Minister, in his reply, went on to say :

In the case of the other contract referred to, namely, the sewerage works at North Sydney, which was carried out under the supervision of the Engineer-in-Chief for Public Works, I am informed that Mr. Hickson, junior, had no connection with that work, being at that time in South Australia.

But Mr. Hickson has been going backwards and forwards between here and South Australia. That makes no difference as to his connection with the firm. He is looking after their work in South Australia, and looking after their work here ; and such an answer as that is, on the face of it, simply a blind, and it shows that there is some reason why there should be a full inquiry into the circumstances attending this contract. Before I sit down, I am going to ask the Secretary for Public Works, whether, if I submit a motion again for an inquiry into the system adopted by the Public Works Department, and the dealings of the public officers with contractors, he will allow it to proceed as an ordinary motion ?

Mr. YOUNG : The honorable gentleman can have a committee of inquiry into this case !

Mr. V. PARKES : I am compelled on a motion of adjournment to confine myself to one case, and if I could get this inquiry I would undertake to show that while the system in the past has been bad, a good system may be introduced in the future with regard to carrying out these public works. Surely the Minister need not oppose a motion of that character by saying that he will regard it as a motion of censure upon his administration of the department. That is a foolish way to deal with the matter. If I had been allowed to have my motion carried last Parliament we should now have been able to initiate a system which would be free of all suspicion.

Mr. SPEAKER : The hon. member has exceeded his time.

Mr. LYNE : Before the hon. gentleman sits down perhaps I might be allowed to ask him a question. He said that the firm in question had contracts to the amount of £35,000, and be only referred to one of £13,000. What other contracts made up the total of £35,000 ?

Mr. V. PARKES : As far as I am informed there was a contract of £13,000, another of £10,800, and another of £11,000, all let without tender. My information has come from persons behind the contractors whose names I can give, and who will go before any committee and give evidence, and show that there is no equity in the dealings between contractors and Public Works officers. They will undertake to show before any commission that the present system is one of favouritism, and that unless they buy their way they have no chance.

Mr. V. PARKES (Canterbury) in reply : I intend to adopt the suggestion of the Secretary for Public Works, and to give notice of motion for the appointment of a select committee to inquire into this particular case. Since the hon. gentleman will not allow me a commission to inquire into the administration of the Department of Public Works generally, I must take this matter as one stage, and I will on Tuesday give notice of motion for the appointment of a select committee to inquire into this particular case. I am sorry that both the present and the late Secretary for Public Works condone the system of accepting sureties from members of a tendering partnership. Both the present and late Ministers are of opinion that there is nothing seriously wrong in allowing members of a firm of contractors to appear as sureties for the firm. I want to point out what a serious thing it is to accept such sureties. What possible good can result from their acceptance ? The only surety which is of use for the due fulfilment of a contract is an independent surety—the surety of persons altogether disinterested in the contract. It is useless to ask a contractor to become his own bondsman. He occupies that position when he takes up the contract. The object of sureties is to get some independent persons to guarantee that there shall be no defrauding of the Government, and that the work will be properly carried out. The department must have known that these particular gentlemen belonged to the firm. Advertisements have appeared in the name of the firm from time to time in the *Sydney Morning Herald*. On the 14th of this month an advertisement from the firm appeared with the names of the present and former members of the firm affixed. The names are those of Gillan, Thomas, Snodgrass, Carter, and Gummow. Two of these gentlemen are the only sureties for the carrying out of contract work which must run close upon £100,000. What would there be to prevent two members of the firm, if any trouble came, from handing the whole of their private means over to their partners, their wives or creditors, and in that way defrauding the Government ?

Mr. GARRARD : Even if the sureties were not partners they could do the same thing !

Mr. V. PARKES : Other sureties would be under special bond to the Government. It is the duty of the Government to discover sureties capable of sustaining their obligations. I have carried out many contracts, and I never carried out one contract of any extent without obtaining the bonds of disinterested parties. Another thing I wish to emphasise before sitting down is that no contract should be given out unless tenders are called in the ordinary way. The giving of contracts without tendering at once leaves the Government open to be robbed by contractors. The system is bad, and leaves an opening for corruption, because any officer of the department may advise the Government to accept a contract for a lump sum, and may enter into an arrangement for concessions subject to the payment of a certain amount of money. In that way you at once open the road to corruption. Contractors are complaining very much at the present time of the particular case to which I have referred. What they say is, "If Carter, Gummow, & Co. are clever enough to get this contract that is all right ; but we want also to be in this sort of swim. They are in the swim at the present time and we want to burst them up." They say this without any hesitation. Contractors who have come to me have stated that they were willing to go before any committee and give evidence establishing the facts which I have named. I shall move for a select committee, and shall endeavour to establish those facts, because I think that there is ample reason for advising the Minister to adopt some system of carrying out public contracts under which there cannot possibly be any inroad upon the public treasury.

[EXTRACT

[Extract from *Hansard*, 12th May, 1896.]

Mr. V. PARKES (Canterbury). It is at all times an unfortunate thing when a supporter of a big parliamentary party feels it incumbent upon him to take exception to the administrative acts of those who are at the head of that party. I am compelled in the performance of my public duties to take exception to many of the acts of administration of a government which I am supposed to support. If a member of this House, a representative of the people, discovers that matters are not going on alright in the administration of public affairs, it is imperatively his duty to expose that which he believes to be wrong, that which he believes to constitute a grievance, in the government of the country. Before coming to the matter which will form the serious part of my address to the House to-night, and speaking generally of the programme put before the House and the country at the present time by ministers, I may say that it is to my mind open to question whether there is any great amount of sincerity in it. How can there be said to be sincerity in the proposals of the Government when at the present time the greatest distress prevails all over the country, calling for immediate legislative action? It is useless for the Secretary for Public Works to tell us that the unemployed are all gone out of the city, and are in the country districts in employment. No man knows better than I do what a wrong statement that is. I know a large number of men who are engaged in mechanical trades, and I can assure the Premier that the administration of past governments, and particularly of his own, has had the effect of sending from 4,000 to 5,000 of the finest mechanics out of the country.

Mr. LYNE: Free-trade!

Mr. V. PARKES: It has been neither free-trade nor protection, but the apathy of the Government in not seizing the opportunity to occupy in this country a fine, able-bodied set of men. There is no shutting your eyes to the fact that thousands of these men have gone to South Africa, that thousands have gone to Western Australia, and that some thousands have also gone to New Zealand, America, and other countries, where they thought they could get work. They have left this country because its legislation would not enable them to make bread and butter for themselves. We have enumerated in the Governor's speech some twenty or thirty measures, and there is not the slightest chance of one-fourth or even one-tenth of them being passed into law during the present session. This being so, even those who wish to be good, candid supporters of the Administration are forced to the conclusion that an attempt is being made to humbug the public. For instance, we are told in the speech that bills dealing with matters affecting the public health, law reform, mining on private property, factories and workshops, fisheries, relief to selectors, the rabbit pest, stock routes, the Navigation Act, the church and school estates, and other measures will be brought forward. The very expression "and other measures" shows that the thing must be humbug. If the Government were sincere in presenting a programme to Parliament, they would say, "This session must certainly be a financial session; but we can at the same time pass through two or three good measures." There can be no doubt that the pettifogging, wretched administration of the Minister of Industry is bringing calamity upon this country. He seems to be concentrating all his energies upon giving poor unfortunate men what is called "tucker." The whole of the hon. gentleman's efforts seem to have been concentrated upon finding bread and butter for a number of good men belonging to various mechanical trades. The hon. gentleman has not initiated any scheme by which he can relieve the great distress which now exists in this country. The hon. gentleman has started a system by which men can get one day's work in seven on a railway work in the country or at Shea's Creek. By the time the unfortunate men have earned their one day's wages out of seven, it is found that the expenses to which they have been put in shifting their homes, in order to get the work, have eaten up the whole of their earnings. I will mention one case, which is particularly cruel. I know of fifty men who have never yet had to ask the Government for work, and who went up to Locksley. Being good navvies, they thought they would have no difficulty in getting work there. What were they told? That a paternal government required them to beg before they were able to work. They were told that they must tramp back to Sydney, and ask the Labour Bureau to give them permission to work on the job. The men walked back to Sydney, and, on arriving there, they found their places had been taken by privileged men, who had letters from members of Parliament.

Mr. GARRARD: That is not true!

Mr. V. PARKES: I will prove it. I say that not only these fifty men; but there are hundreds of men in the country who have had to ask the Government to be permitted to work—who have had to beseech members of Parliament to give them letters, it being known that the Labour Bureau would not give them work unless they had those letters.

Mr. GARRARD: That is not true!

Mr. V. PARKES: Any member of Parliament who has an office in the city knows that what I say is true.

HON. MEMBERS: Hear, hear!

Mr. V. PARKES: Ask any member of this House whether men do not come to him asking for letters for the Labour Bureau. If you tell them to go to the Labour Bureau, they say, "It is of no use my going there unless you give me a letter." There is only one way of overcoming the existing distress, and that is, for the Government to come down to Parliament with a proposal to construct immediately a number of reproductive public works, at the same time asking Parliament boldly for authority to borrow about £10,000,000 to carry them out. That is the best course.

Mr. REID: What sort of a political bribe would that be called?

Mr. V. PARKES: What is the use of hon. members saying that it would add to the national debt. Are we not spending thousands of pounds at the present time in an effectual endeavour to cope with the requirements of the labouring population? The Government provide the men with "tucker," and afterwards come down to Parliament and ask for a vote of £25,000. I will tell the hon. gentleman of another measure which might be passed in the present session, and which would open avenues of employment in all directions. I remember sitting on a public platform with the Premier when he said that for twenty years a local government bill had been dangled before the public of New South Wales.

Mr. SEE: It is not dangled before them now!

Mr. REID: Hon. gentlemen opposite killed it!

Mr. V. PARKES: The hon. gentleman said that if he had the reins of power for six months that measure would be placed upon the statute-book of the country. I admit that the hon. gentleman did bring forward this measure, because the municipalities cried out for it; but what sort of measure does he now



propose in substitution for it? He proposes to confer upon the councils the right to become indebted to the Government for a certain term of years, instead of working out of their present indebtedness. No measure of that kind can take the place of a local government bill. It will only harass the municipalities without getting rid of the difficulty. The Government might just as well take over all the municipalities and manage them themselves. It is of no use lending them money, unless at the same time you bring forward a scheme which will allow them to get out of their present indebtedness. The only measure under which that can be done is a local government bill. Why do not the Government propose to pass such a bill in the present session? Of course, we know that the Opposition are to blame for the destruction of the former measure; but when the hon. gentleman made the measure his second bill, during his first term of office, surely it must be worth his while to bring it forward at the present time. I come now to deal more particularly with the administration of the Public Works Department. There is no department requiring more skilled administration. The great amount of money from the loan and consolidated revenue funds which is expended in this country has all to be dealt with by the Public Works Department. Any robbery or trickery by means of which the public funds of this country could be misappropriated is liable to occur in this particular department, and there ought therefore to be a most exact administration of it. Not only that, but there ought to be a most wise administration. The Minister should be a man having a thorough grasp of the work necessary for the development of this country. Little pettifogging works here and there can easily enough be dealt with by anyone; but the administrator of the Public Works Department ought to be capable of far higher things; and through him, I presume, the Administration. Some six months ago I moved for a committee, and made a statement to this House from hearsay, not from proof, and I took care to explain that to the House. That statement was given to me by ten or twelve contractors, who waited upon me and told me that it was useless for them to send in tenders to the Public Works Department on account of the favouritism shown to a particular firm. I made my speech, and the Secretary for Public Works replied, stating that he would give me every opportunity to get a committee appointed. I made every possible effort in the House to get a committee appointed, but the Government allowed only two hours per week for private business last session, and the Secretary for Public Works would not on any occasion allow me to have a special night on which to move my motion, which was very short. In addition to that, I am not sure whether such a motion would not involve the Ministry itself. Therefore, it is that I have to-night to make the charge in the manner I am doing. The documents from which I will quote shortly will show conclusively that I can justify the complaints I have to make. I do not for a moment say that the Secretary for Public Works has done anything corruptly. I am sure that no hon. member will for a moment believe that the Secretary for Public Works would do anything corrupt; but, after all, it is quite possible for a Minister by stupidity or by negligence to do things which are worse than wrong. That is to say, through ignorance or carelessness he may do things on account of which the public funds are lost, and if that is done it is certainly as bad as corrupt action. There can be no denying that, because under such circumstances you can never know where you are if the administrator is not a man of great capacity and of a searching nature, and if he does not safeguard the public against wrongful expenditure. Following up what I have said, supposing I were to move this session for a committee, I should have to drag through the same game that I dragged through during last session, with the Administration always antagonistic and always ready with their whip if I placed any motion on the paper, to get some one to move the adjournment. I am too much alive to the tricks played under the rules of this House to allow that to be done. I consider that these things are of such a glaring character that they should be shown up. When I found that I could not get a committee of the House, I asked the Secretary for Public Works if he would grant me a royal commission, and allow me to be present at the meetings of that commission. It would be necessary for me to be present, otherwise how could I conduct a case in which I had made such charges? The Minister said no, he would not give me a committee of that sort at all. The only committee he would give me was one composed of officers of the department to inquire into their own conduct. I spoke to the Premier on the subject, but he gave me a cold ear. On the top of all these efforts of mine on the very last day of last session before Parliament was prorogued, the Secretary for Public Works laid on the table a report from the chief engineer. Not only that, but he asked all the newspapers to publish it, so that it should be a reflection upon me. I wish to point out that I told the House that the charges I was making I could not prove, that they were only hearsay, and, therefore, it was the duty of the Government to cause an inquiry to be made. I want to point out to hon. members that under the course pursued the Engineer-in-Chief is allowed to come into this House as if he were a member of it and abuse an hon. member who attempts to challenge his conduct as a servant of the State. If that is to be allowed, the privileges of every hon. member are gone. The Engineer-in-Chief says:—

Although it may be thought, as, indeed, it has been said, that I am making too much of this matter, and that no one really takes any serious notice of these statements, I need hardly point out what a serious matter it would be if they were believed.

Could anything be a greater reflection?

And either the Minister, my officers, contractors, or the general public lost confidence in me.

I can assure hon. members that by the time I have done with these documents a little confidence will be lost not only in this officer, but also in the Minister who blindly signed documents to pay away thousands of pounds without carefully looking into them. The Minister, in his minute, says:—

Mr. Hickson may be informed that the statements to which he refers herein have never had the effect of diminishing the complete confidence I, as Minister, have always had in him in the important office he holds.

That is written before any inquiry is made, and before any chance has been afforded to me of proving what I said. The Minister then goes on to say:—

That I cannot believe they will in the slightest degree affect his position with reference to his officers, contractors, or the general public, and that having consulted the Cabinet as to his request for a commission of inquiry, I am able to state that my colleagues agree with what I have above written. If Mr. Hickson desires to place any rebutting statement before the public I shall have much pleasure in laying it on the table of the Assembly.

There can be no doubt that the Administration there absolutely challenged me. They would not give me an inquiry, and they defy me to get an inquiry. I now appeal to hon. members, and to you, Mr. Speaker. I come to you with this complaint and lay it before you, and I ask this House to be judge in the case.

Let



Let me take up this report of the Engineer-in-Chief. It is untruthful from beginning to end. In the very first sentence he says :

With reference to Carter & Co.'s contracts with the Public Works Department, a cash deposit has in every case been taken.

Now the very first contract I turn up here, although the specification provides for a cash deposit to be put down, on the Secretary for Public Works' authority they are allowed to substitute two sureties of a very doubtful nature. One of the sureties is a supplier of cement and the other is a supplier of iron. By an act of the Minister's he actually cancels this particular bond, which these two people sign. He does this by returning the retention money, and thus breaks the contract. It will be recollected that in my speech six months ago I pointed out that this firm had received three contracts without tender. The only mistake I made was that I stated the sums wrongly and too largely. The Engineer-in-Chief says :

The firm has received one contract only without public tender.

The very documents in his own handwriting show that they received three contracts, one for £1,200, another for £2,000, and another for £12,000, without tender. What reliance is to be put on his statements? The Engineer-in-Chief admits that his son is and has been the engineer of this firm since 1893. I want hon. members to bear that in mind. I am told by a man connected with these contracts, who has worked upon them, that the duties of Mr. Hickson, junior, are simply those of a sinecure. He has nothing to do but to walk about and take photographs. Now and again he uses a theodolite on the works to no purpose, and the inference from the Engineer-in-Chief's own statement is that his son is not in Sydney at all, that as a matter of fact, when he wrote this minute, he was not in Sydney, but in Adelaide. However, he was actually in this country, and I can prove by statutory declaration that he came over twelve months before with Mr. Gillan, one of the contractors.

[Mr. Speaker left the chair at 6 p.m. The House resumed at 7 p.m.]

Mr. V. PARKES: When the House adjourned I was pointing out the inaccuracy of the statements made by the Engineer-in-Chief in his report. In my speech I stated that cheap material was substituted for what was provided in the Government scheme. I said that a cheap class of concrete was used instead of the concrete which was specified. In reply to that the Engineer-in-Chief says :

The materials used in the Monier arches and sewer, substituted for brick and concrete, was not sandstone and concrete; it was three to one compo., and was estimated by the department at from 80s. to 90s. per cubic yard, not at 28s., as stated.

Now, as a matter of fact, it was nothing of the sort. It was estimated as being of a lower value, as will be seen by these papers. But it will easily be understood by hon. members that a compo. three of sand to one of cement is not as costly as a compo. of two of sand, three of blue metal, and one of cement. Three of sand to one of cement is what you call cement mortar, and it makes a very light material. In another place the Engineer-in-Chief says, in answer to me, cash security of £4,000 was taken in the case of the North Shore contract. I will show by the papers directly that although a cash deposit of £4,000 was taken in this contract, that cash deposit was returned to the contractor six months before the job was completed. He also says :

Contract 79A, an extension of the preceding work to Jeffreys-street, was, as before stated, given to Messrs. Carter & Co., on the representations of the member for the district; but I strongly urged that tenders should be invited for the work, as I considered that it might be done more cheaply.

Later on, speaking of the same thing, he says :

In my second minute, quoted by Mr. Parkes, it will be seen that I distinctly stated that I forwarded the paper, on an intimation from the Minister that he (the Minister) was prepared to let the work to Messrs. Carter & Co., and I carefully abstained from making any recommendation, merely forwarding the paper for formal approval.

There is a contradiction in the two matters, and it is contradicted by the Minister preceding. Further on he says :

The sand-pump dredging at Roselle Bay, carried out by the department, flooded the land through which Messrs. Carter & Co. had to construct the Johnstone's Creek storm-water channel. As this would have given them a claim for compensation, a drain had to be cut to take the water off their works, and place the land in the same condition as when tenders were received, Messrs. Carter & Co. providing flood-gates at their own cost to keep the tidal waters out.

Later on I will show that under the specification the onus is entirely thrown on the contractors of keeping the water off their contract. Nevertheless, the department sent out the unemployed to keep the water off their works. Later on he says :

This contract was never under my supervision. It has, ever since the work commenced, been under Mr. Darley or Mr. J. M. Smail.

What a nice subterfuge! Mr. Hickson prepared the plans and the specifications; he let the contract, and he started to work; but because Mr. Darley came in after he had started the work, he says that he had nothing whatever to do with it, but that it was under Mr. Darley and Mr. J. M. Smail. These things can be proved by his own minutes. They are not my own making up, nor hearsay; but I prove them by his own minutes. He says of his son :

He has never communicated—directly or indirectly—with me, or the office, in connection with Messrs. Carter, Gummow, & Co.'s works, the whole of the transactions with the office having been carried out either through Mr. Carter or Mr. Gummow.

I want hon. members to take note of that, because that has an effect on other things I have to speak about. The only communication that Mr. Hickson had with this firm, which consisted of five or six members, was with Messrs. Carter and Gummow. The last part of this report is from Mr. Barling. Mr. Barling says :

It is, I think, proper for me, in submitting this to the Minister, not only as Under Secretary, but as Chairman of the Board of Reference, to express the entire confidence, which the Board have in Mr. Hickson as one of its members. Every matter relating to the contracts which are referred to the Board is most critically examined, and I have great pleasure in saying that Mr. Hickson, as well as every other member of the Board, shows the utmost desire to have every phase of the various questions which arise in connection with tenders thoroughly inquired into, and to this end they willingly give all facilities to the Board.

I fully agree with Mr. Hickson in saying that it is difficult to conceive of any practical method of applying further checks in connection with our tender system. I do not think there is any country in the world where such publicity is given to proceedings in regard to this very important matter.

The reason I read this minute is to show Mr. Barling's connection. Mr. Barling is, I consider, a most improper gentleman to appoint to such a position as that of a member of our Public Service Board. He induced

induced the Minister to do a number of things which I will point out to the House, and by which the State has lost money. Now, if this gentleman was not able to manage his own department, how can he be able to manage the great ramifications of the public service of this country? It is simply impossible. The kind of management which he carried on in the Public Works Department should illustrate his incapacity for judging who is a good servant in our public service. This point is worth emphasising. There can be no doubt that, although there was great necessity for retrenchment in the public service, the retrenchment that is going on now, and the readjustment of offices, will result in calamity, for I consider that the gentlemen who have been appointed members of the Public Service Board are quite incapable of exercising the great discretionary powers which they have to use under the Act. They have not shown the slightest discretion in the way they have gone wholesale to work, and their rearrangement of offices will, I think, fall as a calamity on the Government in their administrative work in the future. Mr. Barling, as hon. members will see, joins with the other gentlemen who are appointed as a board of reference. Instead of having a board of reference or any other board of that kind, this country should have a disinterested board of works; but here is a board of reference made up of these gentlemen who have to carry out the different works, and if one of them makes a mistake the others cloak it—if one prepares a wrong estimate, or plans, or anything goes wrong, the others assist him to cloak it. It is a most improper thing to have a board of reference consisting of those gentlemen who have to carry out the public works which they have themselves designed. I want to connect Mr. Barling with this minute, because, whilst in laying this document on the table of the House the Minister has certainly been advised by his officers, he ought to know that such a document should not have been laid on the table of the House until there had been an inquiry as to the pros and cons, the rights and the wrongs of the case. Now, I pass from that document which I shall require the Secretary for Public Works to withdraw from the records of the House, and I come to this bulky document, and I ask the Secretary for Public Works, in the first place, did he examine these papers before he laid them on the table of the House?

Mr. YOUNG: No, I did not; it would have been a year's work!

Mr. V. PARKES: Although they were moved for, two months elapsed before they were laid on the table of the House; and when charges like these were made I think it was the duty of the Minister, when he collected the papers, to at least see that they were correct. Hon. members have, from time immemorial, protested against the way in which the public departments prepare papers to be laid on the table of the House. Let any hon. member ask a question, and he gets a reply which blinds him entirely. Let any hon. member move for the production of papers, and they are put on the table of the House in such a form that there is no coherence in them. I am going to make a charge against the hon. gentleman's department of deliberately attempting to deceive this House in connection with this document. The hon. gentleman should have examined this document. Does he know that it includes 180 useless printed forms? The hon. member has placed on the table of the House 180 sheets of printed tender forms, and has asked the House to incur the cost of printing them.

Mr. YOUNG: If I had kept any of them back the hon. member would have blamed me for that!

Mr. V. PARKES: But there was no need for the hon. gentleman to insert practically blank sheets that do not bear on the document at all, whilst the officers of the department cleverly abstracted three sheets of schedule prices and comparisons, and in their stead filled this document with blank forms and plans not connected with this matter—in one case numbering sixty-four, in another twenty-seven, and in another thirty, and so on, making 180 altogether. Does the hon. member know that every important minute bearing on an important matter in connection with this case has been abstracted? Does he know that that information which the House ordered to be printed, and which would not have been half as bulky, has been withdrawn, and rubbish put in its place?

Mr. YOUNG: I am sure it has not!

Mr. V. PARKES: Well, look at the document—it proves that itself. Does the hon. gentleman know that where plans are moved for in connection with contracts, they are abstracted, and the plans of neighbouring jobs, which are not even going on, are put in? What is the good of saying "Nonsense"? The plan of Contract 69 was moved for; but the plan of a sewer in Canterbury, which is not even in course of construction, is put in, and the other is abstracted. It is no good saying "Nonsense"—there are the papers.

Mr. YOUNG: As a matter of fact, the hon. member did not move for plans at all!

Mr. V. PARKES: My motion was for

copies of all papers and correspondence in connection with the contracts of Messrs. Carter, Gummow, & Co., at Marrickville, Balmain, North Sydney, Johnstone's Creek, and Stanmore, including the specification, schedule, &c., for original contracts, and for substituted ones, and all vouchers paid, and details of same, and such other matter included in the transactions from commencement to the present date.

What does that cover? I was told on very good authority that while the Public Works officers were compiling this document, the utmost hilarity was taking place, and the one most facetious was Mr. Joseph Barling, the Under Secretary for Public Works, as regards the manner in which these documents were to be placed before the House. There has been the most glaring attempt to deceive the House. The object was to have a mass of documents which no one would look through, and which would be cast aside. If these documents had been prepared in a proper form, instead of costing £500 they would have cost, I suppose, only about £250. Let me show hon. members what is omitted, in order to show the reason for the omission. In connection with Contract 69, sixty pages of blank tender forms which might have been omitted are put in; but the sheets of tenders and estimates are withdrawn, and wrong plans are put in. In connection with Contract 72, a list of other contractors' tenders and schedule have been omitted; all plans, correspondence, and minutes have been omitted; correspondence regarding a claim of £2,000 has been omitted—in fact, every paper of importance has been omitted. In connection with Contract 77, forty-one pages of useless matter has been stowed in, being blank schedule forms issued by the office, while the sheet of comparative tenders is withdrawn. No plan or figures are given concerning the Monier arch—that construction which was substituted for the Government scheme. That which was of so much importance, in order that we might be able to make a comparison, has been entirely removed from the records, and there is nothing to show what the quantities were, or what the nature of the work was, or anything about it. There are nineteen pages which might have been omitted in connection with Contract 79, and all plans necessary have been omitted. In connection with Contract 118, all the plans and sheets of tenders and all correspondence have been omitted, and twenty pages of deceptive padding have been put in. Now I come to the contracts, and I am going to ask the hon. gentleman who administers the  
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Public Works Department whether he was aware when he signed remission of refund of money, that he was breaking a surety bond? Does he know that when he agrees to the contractor having back his surety funds, he is breaking the surety bond, and so letting the surety go free? I want to show the hon. member, if he never took the trouble to look into it, how he stands in this matter. Now, in the conditions of contract, in page 119, there is a paragraph which says:

Progress payments may be made once in every month, unless the same shall become not payable by reason of anything contained in these conditions, on the certificate of the engineer, as the work proceeds, in the proportion of 80 per cent. of the value of the work returned, until the sum retained reaches the amount of the deposit provided for in the preceding clause, when no further deductions will be made. The amount of the retention money will be held by the Minister, in addition to the cash security, unless otherwise provided for in the specification, until the engineer has certified that the whole of the works have been satisfactorily completed, and the period specified for the maintenance of the said works has expired.

That is three months. In connection with this contract it was provided in specifications that the contractors should put down £4,000 security bond, in order that at the conclusion of the work it was found to be defective, or if there was any roguery this £4,000 would pay for it. On the engineer's advice the Secretary for Public Works substituted two surety bondsmen, namely, Mr. Scrutton, who supplied the iron to these contractors, and Mr. Henty, who supplied the cement. As we go further on we find a minute in which the Minister is advised to return the retention money, on the security of these two individuals—not specifying the individuals but specifying the firms. On page 127 the minute says this in reference to the application of Messrs. Carter, Gummow, & Co. for the return of their retention money.

Having now completed a considerable portion of the above contract, for the performance of which your department hold security to the extent of about £6,800, being £4,500 as guaranteed by our sureties and £2,300 retention money for work already done, we have the honor to ask you to allow the payment to us of £1,000 from the latter amount, leaving £5,800 still remaining as security for the due fulfilment of the remaining portion of the work.

The minute goes on to say that the Minister has these firms as sureties while he has only the individuals. The Minister thereupon agreed to the return of the retention money.

Mr YOUNG: It is only fair to read the whole of the letter!

Mr. V. PARKES:

We would remind you that our sureties are two of the most reliable firms in the city, namely, Parbury, Henty, & Co., Pitt-street, and R. L. Scrutton & Co., Clarence-street, and also that the amount of security required, had the contract been accepted in the ordinary way, would not have exceeded £4,500.

Mr. YOUNG: Read the minute upon that!

Mr. V. PARKES: That does not affect the question. The officers deceived the Minister by stating that they have the firms Scrutton & Co., and Parbury, Henty, & Co., when they have only the individuals.

Personal security has been given on this contract for double the usual amount of cash security; so that, in addition to the retention money, which amounts to nearly £2,300, the Department has security for £4,520, making a total of personal and cash security for the due performance of the contract of £6,820. The amount of the contract is £45,207, of which there has been about £30,000 worth of work done. This being the case, and the personal security being Messrs. Henty & Co. and Mr. R. L. Scrutton (firms, I suppose, which are safe), I think £1,000 of the retention money might be returned.—J.D., 21/9/94. Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage. Recommended.—R.H., 21/9/94. Under Secretary. For approval.—J.B., 21/9/94. Approved.—J.H.Y., 21/9/94.

The effect of the hon. gentleman giving back the retention money made the agreement with Scrutton and Henty null and void, because part of the hon. gentleman's agreement with them was that he should keep the retention money until three months' maintenance from completion of the contract.

Mr. COPELAND: In the interests of the country!

Mr. V. PARKES: Quite so; but it appears to have been given up in the interest of the contractors. The hon. gentleman then had no hold upon them. I will prove that the most defective work has taken place upon this job. I see from the Government vouchers that the Minister paid away £6,200 in extras upon that contract. I should like to know whether he ever inquired what this £6,200 was for? Did he know what it was for when he approved of it?

Mr. YOUNG: Where is the page upon which my minute approving of it appears?

Mr. V. PARKES: On page 134 the hon. gentleman will find this entry:

Minister's Approval for £6,200.

Public tenders are called for in this manner: The contractor is asked to send in a schedule of so much brick work, so much masonry, so much carpentering, so much excavation, &c., at certain prices. Each item is marked down with a corresponding cost per yard or per ton. The object of that is that the Government officers may report upon the tenders and get the work done as cheaply as possible by taking it at the cheap-rate schedules, after communicating with the contractors and agreeing with them. Although the scheme, in the hands of honest men, is a very good one for effecting a saving to the Government in some cases, still if it be in the hands of dishonest men the State can be robbed right and left. Let me show hon. members how the case stands as regards this contract, No. 69. The tenders sent in were Carter, Gummow, & Co., £45,207; John Ahearn, £47,061; Kerle and Kerle, £52,735; H. McKenzie and Sons, £53,505; J. F. Carson, £57,239; Dean and Sons, £58,165; and so on. The completed work was much less than in the computed schedules, but Carter & Co. were paid £52,400 instead of £45,000, or £7,400 over. They were paid, for instance, upon schedules numbered 1, 8, 12, 16, 19, 22, and so on. Supposing other contractors had had the same schedules passed for them to do the work under, there would have been a saving in the case of Ahearn of £11,600; in the case of Kerle, of £5,000; in the case of Carson, of £10,052; in the case of McKenzie, of £8,700; in the case of Holloway Bros., of £5,700; in the case of Dean and Sons, of £4,520. Will hon. members dare to say that there was not some collusion between some officers of the department and Carter & Co., in order that they might fix their schedules? Yet the Minister paid this money away without taking the trouble to look into the schedules at all. He does not take the trouble to check the expenditure in any way. Let me show how these quantities are made out. I will take several cases to show hon. members how cleverly things are manipulated. Carson & Co.'s tender for excavations came to £15,500, John Ahearn's to £14,500, Dean & Co.'s to £17,000, and McKenzie's to £17,000. Carter & Co. undertook to do in open trenching 22,815 yards, at 9d.; 9,780 yards, at 27s. 6d., being blasting work; 1,465 yards, at 4s.; 170 feet of manual work, at 40s.; and 345 yards of blasting work, at 5s. Their schedules were so cleverly manipulated that the 9d., which was a losing rate to them, was reduced by 4,000 yards; and the blasting rate, at 27s. 6d., double that of any contractor, was increased from 9,780 yards to 13,294 yards. At the time this contract was going on there were three other members of the firm, who have since left it, and they tell me there was nothing like the amount of supposed excavation carried

carried out; it would have to be exactly doubled to make up the increase. Again, if they had made the supposed excavation, they would have had to pay double the amount which they paid for concrete filling, which does not occur in the filling. The rates were so fixed that they could rob the State of money, and an officer who has been retired from the department, Mr. Bagge, in one minute, said that Carter, Gummow, & Co. were so fixing their schedules as to obtain an undoubted advantage over the Government. All through, this officer, Mr. Bagge, seems to have been making an effort against his superior officers, in order to secure justice to the country —

Mr. CRICK: By whom was Mr. Bagge retired?

Mr. V. PARKES: By the Minister, I think, upon the recommendation of the present Under Secretary of the department. Then take the shafts. Carter, Gummow, & Co. put in so many shafts at a losing price. The sewers would not be any the worse for having the full number of shafts put in; but the number was reduced by seven, and then instead of being paid for blasting work at 4s. and 5s. they were paid for it at the rate of 40s. They substituted the manual labour rate for the blasting rate. It was clearly proved in the case of Regina *versus* McLeod that neither the Secretary for Public Works nor his officer had any power to in any way increase the cost of contracts by substituting a more costly material, or by adding to the price of any of the items. There is no doubt in my mind that by paying these moneys the Secretary for Public Works has illegally given away public funds. I now come to the item of "subducts." They are necessary in the case of every sewer for drainage purposes. They were estimated by the public officers at £600. One contractor contracts at £954, another at £668, another at £879, another at £1,366, another at £1,612. It will be seen that the amounts varied from £600 to £1,612. Carter & Co. put these drains in at 1d. each, or upon the whole lot, they put down £8 16s. 8d. Eventually, however, the Government officer did not have these subducts built. There is no payment whatever for them, and as a matter of fact they were not put in.

Mr. CRICK: No wonder they were not put in when the contractors would have had to do £600 worth of work for £8 16s. 8d.!

Mr. V. PARKES: Will hon. members tell me that this was not a prearranged affair? Do they suppose for one moment that this firm would have risked having to do £600 worth of work for £8 16s. 8d.? Was it not on the other hand a duty of the public officers to have these ducts put in at the cheap rate to the country at which they could have been put in under this contract?

Mr. ASHTON: Can the hon. member show me from the papers where the firm obtained permission to omit the subducts?

Mr. V. PARKES: No; but they did not do them, and they were not paid for them. Upon page 125, hon. members will see a letter written by one of the junior officers of the department to the Engineer-in-Chief for Sewerage. He says:

As some of the man-holes on this contract are being constructed, I should like the Engineer-in-Chief's decision as to the kind of pitching, if any, which is to be put round the man-hole covers.

Twelve square yards of squared bluestone pitching were included in the schedule of quantities, which the contractors have priced at £50 per square yard. The quantity likely to be used if the whole of the man-holes are to be pitched will be 35 square yards, which, at schedule rates, will amount to £1,750.

Special bluestone concrete will answer the same purpose as bluestone pitchers, and will only cost 9 cubic yards, at 50s. = £22 10s.

The fair price for bluestone pitching is about 25s. per square yard, and, as the schedule rate is so much higher than the market rate, the question arises whether the pitching should not be omitted. If, however, this course is considered to be unfair to the contractors, then only the quantity included in the schedule of quantities need be carried out.

The Engineer-in-Chief in his minute says this:

We cannot in fairness omit an item for which, no doubt, the price is absurdly high, while we know that on other items the price is equally low. Where bluestone pitchers are shown on drawing contractors must be paid for same at schedule rates.

But I will show that they have selected all the high items on which to pay these contractors. To show the iniquity of this I may say that they not only pay £50, but they increase it twofold by taking out the sandstone where it is provided and putting in bluestone. If that is not an act against the interests of the country, I should like to know what is. A certain number of sandstone pitchers are to be put in. These are withdrawn and bluestone substituted. That is to be seen in the payments made to the contractors. I can show that they have carefully manipulated every one of these items, so that the country suffers and the contractors gain. In Contract 72, in which there are no particulars shown, a claim was made by the contractors for something like £4,000. In this contract we have simply the papers given to us—the specification and the payments. But in the schedule there is provision made for the excavation, which is to be done according to the schedule of the contractor, which he undertakes to carry out, and it shows that he has a contract to excavate 26,200 cubic yards, and 12,000 cubic yards of filling. When we come to the payments we find that the contractor, instead of being paid for 26,000 yards of excavation is paid for 53,000 yards of excavation at 2s. 6d. Then instead of being paid for 12,000 yards of filling he is paid for 27,000 yards of filling or something more. Now there are no papers whatever to show why this extra is paid, nor is there any paper to show why another claim of £4,000 is granted in addition later on. But I was told by a member of this firm, who has left it, that the Government stopped this work to get possession of some land, or for some purpose, and although there is a provision in the contract which throws the whole obligation on the shoulders of the contractors for all these delays, that while the work was stopped there came a very heavy flood and it washed out their works to double the extent to which they had been carried on, and I was told, and I believe it to be true owing to the authority from which it comes, that the Government officer has not only paid them for the work they did, but paid them for all the flood-water washed out, and then paid them to fill it up again.

Mr. YOUNG: What contract is that?

Mr. V. PARKES: That is contract No. 72. There is just another little item to which I will refer to show how these things are manipulated. There is one item of wrought-iron girders. The trade price for wrought-iron girders placed in position is from 11s. to 13s. per cwt. A few years ago the price was 13s. a cwt., but it is 11s. at present. In the schedule provided by the contract the Government are to get a certain quantity—that is, 74 cwt. The contractors give the price at 25s. per cwt.—that is, 100 per cent. over the proper value. Without rhyme or reason the quantity is increased from 74 cwt. to 400 cwt., and they pay for that at 25s. per cwt.—that is, the contractors are given a neat little sum of £280. Every effort has been used in the settlement to give Carter, Gummow, & Co. an advantage over the Government. Now, I come to contract 77, which is for the Balmain sewerage. The papers are at page

205. That is a contract in which part of the work was to be a tunnel and the rest an aqueduct. Under the Government plan the aqueduct was to be superior concrete with brick and cement arches. It was to be self-supporting, that is to say, sufficiently strong for vehicles to go overhead, if that had been the purpose. It was to be brickwork of the very best description, and the bricks were to be patent kiln burnt. It was thus to be a work of the most permanent nature. Yet the Government, under the Secretary for Public Works, allowed the contractors for a saving of £250 to substitute a scheme of their own, consisting of cement arches, which would not stand unless supported by tie-rod iron. The best description I can give of that to hon. members is to take this chamber, and to suppose that the walls are so weak that they cannot sustain the roof, and the weight of the roof is sufficient to push out the walls. The first thing to be done under such circumstances would be to put in iron tie-rods. These arches are so weak that they cannot sustain themselves, and have to be tied with iron tie-rods. That is what the Minister allowed the contractors to substitute for his own good, permanent plan.

Mr. YOUNG: Will the hon. member be fair enough to read the advice on which I acted?

Mr. V. PARKES: I cannot read everything in these documents.

Mr. YOUNG: The hon. member will not read what is fair!

Mr. V. PARKES: I will show on what advice the Minister acted. This patent, with regard to the Monier arch, this useless, risky thing, was invented in Germany thirty years ago for ornamental work in gardens, and it was never intended for such work as I am referring to. This cheap thing was reported on by Mr. Bagge, and he shows that it is 50 per cent. cheaper than the Government scheme. Now, in the first instance, in 1893, Carter, Gummow, & Co. offered this thing to the Government for £1,500. They offered to sell it to the Government, but in this one contract the Government leave them their patent and give them a preference of £3,000; that is, the whole of the contract for the use of this patent in the grave losing job. In his report, on the 21st September, 1894, Mr. Bagge says:

The sewerage aqueducts have hitherto been constructed here in such a manner, method, and of such materials that any competent tradesman, in his special line, obtainable in the colony, could do the work.

Now, however, as it is a matter of the greatest importance to reduce the cost of the works, there seems to be no other way of accomplishing this object but to adopt for this colony a more or less experimental system of construction for these aqueducts—of increasing the spans of arches, introducing arches with joints, of constructing the whole in concrete, and of constructing the whole of the work of concrete and mortar and iron.

Then he goes on to say:

In the old home countries these novel systems of construction have caused in the commencement failures, owing to the works being carried out by more or less inexperienced and untrained engineers and artisans; hence the various State governments would not entertain and construct works on these novel methods until special companies established themselves, who made it their special business to carry out such works with artisans who had had time to gain the necessary experience, and who had been practically and specially trained in the construction of such work.

It was only to such companies that works, which are termed purely and simply specialities, were entrusted, after they had given adequate security for the faithful, careful, and competent execution of same.

Now, when this work was submitted to the Secretary for Public Works, Mr. Bagge reported in this manner: He sent in a report in which he drew a comparison between Mr. Ahearn's contract on the sewage farm, and he showed clearly by his figures that this work was 50 per cent. cheaper than the work specified by the Government. I ask hon. members to mark how the Secretary for Public Works was so cleverly outwitted.

Mr. YOUNG: Where does Mr. Bagge make those statements in his report?

Mr. V. PARKES: He says this:

The plans for the White's Creek and Johnstone's Creek aqueducts as designed in this office, for which tenders were invited, were prepared with a view to securing the most substantial and enduring structure at the most reasonable cost. At the time that this design was made, I had as full particulars regarding the "Monier" principle as it was possible to obtain in the colonies. I would also like to point out that in Europe this class of work is made a specialty, being patented, and is wholly in the hands of private companies, who are required to give a substantial guarantee for the stability of their work. I think it would not be advisable to construct at the outset a work of such importance on the "Monier" principle.

|  |         |
|--|---------|
| The total for the office design amounts to .....   | £15,757 |
| The total for the contractor's Monier design ..... | 15,500  |
| Difference .....                                   | £257    |

Mr. YOUNG: The hon. member said it would cost 50 per cent. less!

Mr. V. PARKES: This is in a report laid on the table of the House on the 5th October, 1895. Now, let me show you what the Engineer-in-Chief says. This will show how these officers catch the Minister. The Board of Reference, on the report of the Engineer-in-Chief and on his advocacy, sent in this report to the Minister:

The Board, in view of the fact that Messrs. Darley and Hickson are satisfied that the principle is a sound one, and that the adoption of the plan will result in considerable economy, are prepared to indorse the recommendation of these gentlemen, and now submit the matter for the Minister's consideration.

It goes on to the Minister, and he writes:

Before approving of this proposal, I should like an estimate of the actual value of the work to be carried out by the contractors under the substituted scheme.

That is very fair. Listen to the report of the Engineer-in-Chief:

To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm estimates were made for the work on the Monier system, as well as on the department's designs. The result was that the estimate of both works was practically the same.

But there is an estimate, according to Mr. Bagge, that it is 50 per cent. cheaper.

Mr. YOUNG: Who is to be believed—Mr. Bagge or the Engineer-in-Chief? It is simply a matter of opinion!

Mr. V. PARKES: But Mr. Bagge's report is the one referred to, and here we have a report submitted to the Minister by the Board of Reference recommending the adoption of this substituted work on the ground that it is cheaper; but the next day he obtains a report from the Engineer-in-Chief telling him that the cost of the two methods is the same. Then he says, "That is sufficient for me; I will authorise the substitution." Then the Minister accepts this "cheap-John" thing on a report of that description. Why, if he were charged the same price, there was the more reason that he should stick to the good and substantial work of his own office. There is an exceedingly clever piece of business, and hon. members ought to follow it.

Messrs.

Messrs. Carter, Gummow, & Co., in submitting their tender, said that they were prepared to find sureties for £6,000 each to guarantee the maintenance of this work for five years. Their specification is here—it is not an office dictation, but their own submitted undertaking. Carter and Gummow write :

We have the honor to draw your attention to the conditions upon which the acceptance of our tender depends for Contract No. 77, Balmain Sewerage Works, and to our conversation with you of even date in connection with security required for its due performance.

We respectfully submit that our personal sureties for the amount necessary should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work.

We are a firm of sound financial standing, well and favourably known to your department as contractors for many large and important contracts extending over a period of eight or nine years under the Departments of Harbours and Rivers, and Roads, Bridges, and Sewerage, which facts we trust will satisfy you as to our *bona-fides* in this matter.

That is, they offer their own firm as their sureties instead of a personal undertaking. Mr. Hickson, in reporting on this, commences by saying :

The accompanying letter of 4th April, 1895, from Messrs. Carter, Gummow, & Co., is a protest against the stringent supplementary specification prepared by Mr. Norrie, at my suggestion, with regard to the alteration in the design of Contract No. 77.

It is not a protest ; it is an offer in substitution of the contractors' former offer.

The last paragraph of this specification states :—“ And the contractors shall enter into a bond to Her Majesty the Queen in the penal sum of £12,000, with two sufficient sureties in the penal sum of £6,000 each, to secure the removal of so much of the said works as shall have been constructed on the Monier system, &c., &c.”

The amount of £12,000 is the sum it would cost the department, at departmental rates, to renew that portion of this sewer which is built on the Monier system.

It is right, however, to say that the tendered rates for this portion of the work would only come to £9,000 ; but, prices being abnormally low, I think it is only right to put in a sum at which the department really values the work.

Messrs. Carter and Gummow ask that their own “ personal sureties for the amount named,” that is, £12,000 (an amount which they do not dispute), “ should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work.”

They go on to say that they are “ a firm of sound financial standing, well and favourably known to the department as contractors.” This is quite true. They are a firm in which I have every confidence. They have done a great deal of work under me, and I can testify that their aim always has been to turn out the very best class of work possible.

I may tell hon. members that before this minute was written Mr. Hickson had to put a new bottom to the Pott's Hill reservoir which these contractors built, and also a new bottom to the Waterloo sewer. I want hon. members particularly to mark what I am now going to read :

At the same time, misfortunes happen to the very soundest firms of contractors, and the department must look a little way into the future. Their own bond for £12,000 would be really of no use if they were unfortunate enough in the meantime to become bankrupt.

I think, therefore, it is right that the sureties should be insisted upon. They give the names of two men, Mr. George Forrest and Mr. James Gillan. From inquiries made, I believe these men to be financially sound, and, I think, if their names were accepted as the sureties in the penal sum of £6,000 each, the department would be secured as far as it is reasonably possible to be.

When Mr. Hickson wrote that letter he knew that these two men, Forrest and Gillan, were members of the firm to which his son was the acting engineer.

Mr. YOUNG : Will the hon. member read the last sentence ?

Mr. V. PARKES :

This work will be carried out under Mr. Darley, and I recommend that the whole of the papers be sent him, to give his opinion thereon.

Mr. YOUNG : Now let us have Mr. Darley's report !

Mr. V. PARKES : Why ?

Mr. YOUNG : It is only fair to Mr. Hickson !

Mr. V. PARKES :

I concur with Mr. Hickson. I think in accepting a new patent of this kind, and adopting it in a large and costly contract, that the department cannot be too careful in securing its position by leaving all the risk in the hands of the contractors and patentees. I, therefore, recommend that the personal names be required for further security. The names mentioned may, I think, be accepted.

I expect that Mr. Darley, without bothering himself, and relying upon Mr. Hickson, indorsed Mr. Hickson's minute. That letter was written on 5th April, and Mr. Hickson's son came up from Adelaide with Mr. Gillan to sign that bond as an independent surety, and the Secretary for Public Works accepted it.

Mr. CRICK : Does the hon. member mean that the Secretary for Public Works knew that those men were members of the firm ?

Mr. V. PARKES : He must have known it, because they signed contracts two years before as members of the firm, and Mr. Hickson's son was engineer for the firm at Adelaide and was along with Mr. Gillan. He knew that when he wrote that minute this was the case—it is a gross piece of deception on his part. That minute was written on the 5th April, 1895, and on the 13th April, 1895, this notice was published in all city papers :

Notice is hereby given that the partnership lately subsisting between us, the undersigned, John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing, as contractors, carrying on business in Adelaide (South Australia) and Sydney (New South Wales) under the name, style, or firm of Carter, Gummow, & Co., was on the 1st day of April, 1895, dissolved by mutual consent in so far as regards the said George Maddison and Peter Ewing, who retired as from that date from the said firm. All debts due or owing by the said firm will be received and paid by the said John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, and James Gillan, who continue the business under the same style of Carter, Gummow, & Co.

I ask the Secretary for Public Works what is the good of that surety bond ? The Engineer-in-Chief says he could not think of accepting the whole firm as their own sureties, and then he goes on knowingly and recommends that two members of the firm—that is, part of the whole—shall become sureties for the job. Is that not deception ? It is deception perpetrated with intention. I will show how clearly the intention is made out. In all other contracts the specifications contain this paragraph :

In submitting a tender the full Christian name of the tenderer must be given, or when the offer is in the name of a firm, the names in full of each member. When bondsmen are required, the names in full, occupations, and addresses must be stated in the tender. The omission of this information will render the tender liable to be declared informal.

Now, that item is omitted in the contracts for this No. 77 job. In addition to that the statutory declarations which Messrs. Forrest and Gillan made are in these words :

I, George Forrest, of Marrickville, in the colony of New South Wales, householder, do hereby solemnly declare and affirm —

Hon.



Hon. members will see that from this statutory declaration is omitted the place of residence or the fact that Forrest is a contractor. The other declaration says:

I, James Gillan, of Dulwich Hill, in the colony of New South Wales, householder —

Although he lives in Adelaide it is not so stated. It omits the fact that he is a contractor. It is fixed up so as to leave Forrest and Gillan open to sign this bond. There is no doubt about it that the whole matter is bogus; for if the contractors become insolvent, and the whole thing bursts up, and they have no estate to come upon, what security is there to cover this risk? I quote this to show how the Minister has allowed himself to be hoodwinked by the officers of the department. In connection with this contract, there is no doubt, from estimates I have made, and which I challenge anyone to refute, that the works saved to these contractors by the substitution of their own plans and specifications are equal to about £4,000. Instead of the saving to the contractors being only £275, as the Government put it, it is from £3,500 to £4,000. Now, let us take Contract 79—the North Shore contract. This contract was let to Carter and Gummow on a schedule in the same manner as the others—that is, they undertook to do what is called guttering and gadding work—that is, manual labour, to the extent of 1,300 yards. If hon. members will turn to page 333, they will see that Carter, Gummow, & Co. in their schedule undertook to excavate 1,300 yards, at 63s. for manual labour. They then undertook to excavate 3,000 yards and 2,500 yards blasting work which was to be done at 60s. and 78s. Other contractors estimated for the gadding work £6 and £7, but the estimate of Carter, Gummow, & Co. was 63s.; and for blasting they estimated at 78s., whilst other contractors estimated at about 60s. The Government substituted the blasting work for the manual labour, and by that means gave the contractors about £4,000 or £5,000. As hon. members go further down they will find that the firm were paid in excess £1,598 and £600, that is £2,198 altogether. This was paid for concrete to fill up defects, in spite of the understanding being that they should not be so paid. The Minister, although a bond was accepted for £4,000 for the due completion of the work, and he ought to have kept back the retention money, six months before the job was certified for, and before it was completed, returned the whole of the bond money.

AN. HON. MEMBER: What security had he for the completion of the work?

MR. V. PARKES: None.

MR. YOUNG: Because the work was done!

MR. V. PARKES: It was not done, and the contract said clearly that the money must be retained in hand three months after the certificate that the work was satisfactorily completed by the contractor. The retention money has been returned, and I want to produce an affidavit made by one of the workmen on this job to show what risks the Administration took in returning the bond money. That money might still be in hand to repair the damage disclosed in this affidavit; but the Government have returned it all and have no remedy. This affidavit is sworn by a labourer who is still working for Carter, Gummow, & Co. He says:

I am a labourer on Contracts 79 and 79A, putting in brickwork and concrete as packing. From shaft No. 13 of Contract 79 the blasting has blown out large cavities from 4 feet to 4 feet 6 inches over the top of the brick lining, which under the contract should be tightly packed with cement, but which have not been packed with cement, except here and there where the rock comes close to the brickwork.

To my own knowledge this defective work commences from 270 feet down stream from shaft 13 to 380 feet, and to my firm belief, from the conversation between myself and several others, the whole work is of a similarly defective nature; and in all the links in which I have worked none of the packing is done as required to specification.

That document was sworn to, and cannot be refuted. The action of the Administration in giving up the cash bond, which no engineer, no business manager in any capacity would have done, has left the Government with only one resource, namely, that of going to law with the contractors. If what this affidavit says is true, they have no remedy otherwise than the costly remedy of an action at law. Actions of that sort ought to condemn the Administration who allow them. Why should they take these risks? Everything is done as against the state. I have pointed out that the schedules have been adjusted so as to allow the contractors to blast, and that blasting has been the cause of all that defective work; and the workmen told me that in some cases the cavities left have been so great that a man could walk along them. This state of affairs ought to receive a severe check at the hands of the House. If I were to read everything that has taken place, as disclosed by the minutes, the House would be astonished at the looseness with which our Ministers administer the public funds. As regards Contract No. 79, there can be no doubt that if the same concession had been given to other contractors as to Carter, Gummow, & Co., as disclosed by the papers, the country would have benefited to the extent of £10,000 on this job. Since I moved the adjournment of the House on the subject upon a former occasion, the Water and Sewerage Board have called for tenders for a third section. Two sections were given to Carter, Gummow, & Co. without tenders, but the third tender was accepted at 40 per cent. under the schedule prices of Carter, Gummow, & Co.'s contract. That is conclusive evidence of the concessions that have been given to these contractors.

MR. McMILLAN: What interval of time elapsed?

MR. V. PARKES: About four months.

MR. McMILLAN: And what was the alteration in prices?

MR. V. PARKES: I have pointed out to hon. members that blasting was substituted for manual labour in the excavations, and now I want to point out that all this has been done against the repeated protests of the residents of the district. There were letters constantly pointing it out. This contract was carried on during the night time, and one officer pointed out in his report that the work was not supervised during the night time. He says, "This work has been carried on at night time, when no supervision could be given." Another clerk of works who was doing his duty, and who could tell the country a great deal if put under oath, discreetly says that he will not give any information unless he is put under oath. He is right in that. He will not give me information; but I have gathered sufficient to know that there is a very wrong state of affairs going on. This man has been dismissed. Why? Not because he has done anything wrong, but for quarrelling with the contractors' foreman because they would not supply good material. He tells me that he wants to get back into the department, and having been a fool once, he does not want to be a fool a second time. Here is the report upon his case. He says:—

I beg to report that on several occasions I have had to complain about the time the sandstone concrete is mixed for packing brickwork in shafts. To-day two 20-foot mixings were made up at 2 p.m. at No. 5 shaft. This concrete will not be put down shaft for use till 5.30 p.m. I have instructed Connors (foreman), who has charge of this work, not to have the concrete mixed so long before being used. He states to me that he has to take his instructions from the firm. I saw

Mr.



Mr. Snodgrass last Friday and complained to him about this matter, when he promised it should not be mixed until one hour before it is required to be used. I spoke to Reid (contractors' representative) to-day, and he states that they shall mix the concrete when convenient for themselves.

Inspector Reid informs me that on Saturday last, 17th February, about 1 p.m., at No. 6 shaft, it required half mixing 10 feet of sandstone concrete to finish brickwork packing in shaft. Henderson, bricklayer working in shaft, was on mixing board, and started to assist labourer gauge the stone. Inspector Reid instructed Henderson to use the fork in place of shovel in filling gauge box, as the stone, which is broken close to the mixing-board, is not free from refuse. Inspector Reid asked Henderson the second time to use fork. Henderson replied that it did not want forking. Connors, foreman, came on the scene, and said to Henderson, "Go on; do not take any notice of him, he's only a damned big buck navy."

The man was subjected to this insult for doing his duty and doing his utmost to prevent the contractors from cheating the Government with bad material. What was the result? From the minutes you will see that he was taken from that job, and in a few months dismissed. The only reason is that he quarrelled with the contractors' foreman; but you must recollect that he quarrelled with the foreman in the interests of the country, to save the money of the country. These contractors were not the lowest tenderers by a long way. A firm of contractors named Bond and Hudson sent in a tender to do the work for £3,000 less than the contract of Messrs. Carter and Gummow. I will show how cleverly the department acted in getting rid of Messrs. Bond and Hudson's contract. The minutes bear out everything I say. Messrs. Bond and Hudson's tender was accepted by the Board of Reference; but Messrs. Bond and Hudson were not notified of that for three months. They then wrote to the department, and asked if their deposit money might be returned. One of the conditions is that the contractors' money shall not be returned if they fail to take up their contract. But in this case Bond and Hudson's cheque was returned, in order that they might be got out of the way. Instead of having tenders called for, the Engineer-in-Chief said—Messrs. Carter and Gummow having a claim for £4,000 on Contract 72, he recommends them to forego this claim, and says they can have a preference to the amount of £3,000 over the other contractors. That is a cool way of settling a claim, and the beauty of it is that the claim has never been tested by the law authorities. It was the duty of the Government officers to see whether it existed—whether there was a claim at all; but the claim was admitted, and Messrs. Carter and Gummow received the preference over other contractors if they would forego their claim, as to which one of the late partners told me they had not a shadow of a leg to stand upon. Their own solicitor told them that; but this claim was accepted as being correct, and the claim was put in when No. 72 was only half finished, and not a month before they received the preference in regard to the other job. There cannot be the slightest doubt that, if the work had been tendered for, it could have been let 30 per cent. cheaper.

Mr. COPELAND: What was the amount of the contract?

Mr. V. PARKES: It was £35,000 when it started, and it was increased to about £45,000, I believe.

Mr. COPELAND: Were they the lowest tenderers?

Mr. V. PARKES: No. Messrs. Bond and Hudson were the lowest tenderers. I am now speaking of Contract No. 79. I will read the report of Mr. Bagge who tried to save the department from entering upon that scheme of the Monier patent. Mr. Bagge points out where they were proposing to allow the contractors to substitute blasting for manual labour. He says:

Messrs. Carter, Gummow, & Co. have undoubtedly fixed their schedule prices speculatively to increase their profits on the contract as much as possible, and, if so, to the loss of the department.

There is no doubt that there is evidence of what the officer says right through the job. If we look through the whole of the papers we shall find that these contractors have in every case received thousands of pounds, which, if the matter were tested under proper regulations they could not claim from the State. I will now refer to Contract 118. That is the contract in reference to which I complain, that unemployed labour was taken to do the work which they had to do under their contract. O'Neill & Co. were carrying out Contract No. 83, and they informed me that the whole of the sandstone which they brought for this work was condemned. That stone was returned to Mr. Ryan's quarry at Pymont. Then Messrs. Carter and Gummow were allowed by the Engineer-in-Chief to use that condemned stone at half price on Contract No. 118. You cannot get away from this statement, because O'Neill saw Ryan, the contractor, and Ryan says emphatically that he sold to Carter and Gummow, with the approval of the Government officials, the whole of that stone, to an enormous extent, which was condemned in O'Neill's Contract, No. 83. O'Neill in all probability is not a man of great means. He is not perhaps so much in favour with the department as are Messrs. Carter and Gummow. It is a serious thing if stone which is defective on one job is permitted to be used on another job. It was taken over to Contract No. 118, crushed in Mr. John Young's mill, and put into the contract holus-bolus as it came out of the crusher.

Mr. ASHTON: Was it the same class of work?

Mr. V. PARKES: If anything it was a superior class of work. Again, as regards Contract No. 118, I have to complain that there is no document given by which any proper estimate can be made. The plans were omitted and other plans were substituted, and the whole thing is so fixed up as to make it impossible for any hon. member to arrive at a proper conclusion as to what the works contain. Again, in the Contract No. 79, that old trick of subducts is played. These subducts are simply drains which are put under the beds of the sewers where there may be waste rock or imperfect earth of any description. The object is to drain into each shaft any water which may accumulate, and which may damage the beds of the sewers. They are absolutely essential to the sewer, but if they are not put in it can never be found out afterwards that they were not put in. Messrs. Carter and Gummow estimated these subducts at £4 5s., whereas other contractors estimated them at £452 and £666. This is a nice state of affairs! It is fair to assume that Messrs. Carter and Gummow must have been told by the officers that the subducts need not be built. The whole of the schedule is treated in the same way. If the work had been carried out conscientiously by the department, on this job alone there would have been a saving of at least £10,000. If I had been the engineer who had had to settle this contract, I should have had the work carried out in such a manner that the country would certainly have been saved £10,000. If a Public Works Committee should ever hold an inquiry, this schedule system will be proved to be a means of gross robbery of the public funds. If I were to go into all the details which I have taken out, the House would not bear with me. It would be useless for me to run right through all the details I have. But so gross are the acts which are disclosed in these contracts, and which are consented to by the minutes of the Minister, that I do not see how any inquiry possibly can take place without affecting his administration of his office. It would be useless to have an inquiry into the conduct of the officers alone when the officers are backed up entirely by authoritative minutes by the Minister to carry out these works. They simply fall back and say, "It was done by ministerial instruction," as the Engineer-in-Chief falls  
back

back and says he submitted a document in one case to the Minister, on which he did not make any comments, and which he left entirely to the Minister's discretion. They will turn back upon the Minister, and say, "It was by ministerial authority I did these works." There can be no doubt that if you want to get to the bottom of this system of contracting—this system of playing a game of chance catch with the funds of the people—you can only do it by having a thorough investigation of the department. The Minister has not only refused to consent to a thorough investigation of his department, but he has laid on the Table a report from the officer who conducts these works, making out that my statements were inaccurate; in fact, that I was speaking that which was a lie. From these documents I think honorable members can have no hesitation in authorising a Committee of inquiry. The Premier stated that he would be willing to give me a Committee; but when I proposed to him that it should be of such a nature that it could not fail to find defective work, he would not give me a Committee at all. The Secretary for Public Works, through incompetence, and through not looking up his papers and seeing into his contracts sufficiently, has led this country into expenditures which evidence gave negligent administration of his department. Whilst we are asking the country to pay fresh taxation; whilst we are asking the taxpayers to contribute the interest on the loan moneys which we are expending on these contracts if they are to be administered so that thousands of pounds are given away simply as a bonus to the contractors, we certainly ought to see that the administration of the Department of Public Works is exact in all its ramifications. I certainly feel compelled to vote against the administration after the manner in which the Secretary for Public Works has shown his incapacity to safeguard the great interests of this country. It is impossible for us to ask the people to pay new taxes if we are to waste the money in this fashion. From the calculations which I have made, and which would take me, perhaps, half an hour to describe to the house, I would guarantee to prove beyond any refutation that in these six contracts £40,000 has been paid away to the contractors improperly; that in a great number of the contracts there is no security, bond, or anything by which you can attach the contractors; that the contractors have substituted, through the knowing wrong-doing of the head of the department, their own partners as sureties for risky contracts; that they have by minutes hoodwinked the Minister—and minutes of such an extravagant nature that he ought himself to have been able to see them, because I, not a Minister but with these incomplete papers, was able to see these things in ten minutes. For instance, what Minister could make a mistake in a case of this kind? Mr. Bage reports to the Minister that the work on the Monier arch can be done at £6 per lineal foot as against £10 per lineal foot on Ahearn's sewer work at the sewerage farms, under the Government engineer's scheme and plan; and the Engineer-in-Chief states that he has made a comparison between the two, and he finds that it will cost exactly the same as the other, his reference being to this very report. Yet here is a paper showing that the test when made was 50 per cent. cheaper. The papers show such negligence on the part of the Minister in looking into what he was doing that I think the House, if it wants to safeguard the public expenditure, must come to some definite understanding that will compel the administration to do right. No one would dream of making a charge of corruption against the present Minister or any other Minister, but there can be no doubt that the moment officers put papers before a Minister, he signs the papers without making the slightest inquiry. In this matter the Secretary for Public Works has, I consider, been glaringly negligent of the public interest; and for the affront he has given this House by allowing reports to be laid upon the Table before there is any chance of an inquiry being made, I think he deserves the greatest censure. Nothing can so drag the privileges of Parliament through the mud as to allow of any intimidation against honorable members stating here their free thoughts on all subjects. If an honorable member hears outside something which is against the public interest, here is the place where he should divulge it, and if the Minister adopts a method of trying to intimidate an honorable member before he can possibly get an inquiry, after blocking all his efforts to get an inquiry in the past, he deserves the greatest censure. Let me refer here to the general manner in which this administration treats the people of this country. There can be no doubt that the way in which the Minister of Public Instruction—he who above anybody else should show the greatest amount of dignity and culture—receives deputations from the people whom he presumes to govern is something appalling. I took a deputation to the Minister of Public Instruction, and I retired from the room long before the deputation had finished. Fancy what a dignified, philosophical schoolmaster must think of the conduct of the Minister of Public Instruction, and the manner in which he conducts his office! I will give an instance of the way in which the Minister receives deputations. A deputation which I introduced to the Minister was received in this way: "Well, what d'yer want?" was the first question he asked, and before the chief spokesman for the deputation had a chance to state his case, the Minister was down his throat, and I left them there wrangling away with one another. I think that a cultured gentleman who presumes to be Minister of Public Instruction ought to administer his office with even more dignity than any other Minister administers his office. His administration of the Department of Public Instruction is likely to bring it into contempt. But a graver thing is the apathetic way in which he is allowing that fine system of technical education which we built up to fall to waste. This sort of administration cannot be long upheld, even by their staunchest supporters. If you put too many matters into an undertaking within a short space you will get nothing, and out of this programme which the Government now put before the country you will get nothing; but in the meantime we are to allow them to go on administering public affairs in the slipshod fashion in which they are doing. If the Minister of Public Instruction would but only go to the Colonial Secretary, or to the Secretary for Lands, and see the dignified manner in which those gentlemen receive deputations, he might learn a lesson. What has been the administration of the Secretary for Public Works? Nothing but a snapping at those people who are asking for public works from him. Until his late trip he has not endeavoured to increase the public works of this Colony in any judicious manner. No proposals of any wisdom for carrying out public works have come from him. There has been no progressive development of the country, unless it be through the Lands Department. But in a Colony like this the main thing ought to be to develop the country. The administration that is going on is one of State robbery by contractors and certain officers of the department, who, whether they are benefited or not, at all times assist to hoodwink the Minister in order to help the contractors to get money out of the department. It is with great regret that I move the amendment which I have foreshadowed. I intend to move my amendment because I have no other opportunity, under the manner in which I am treated, to get justice. It would be impossible for me to bring up the matter in any other way, either by asking for a Select Committee, or by moving the adjournment, without criticising the administration of the Minister, and the department generally. The Minister is in every way allied with his office, and I cannot help reflecting upon his department. Therefore, there is

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but one courageous thing for me to do. If my amendment is ignominiously defeated, I trust that the exposures which I have made will bring about a thorough renovation of the administration of the Works Department, and that it will make it impossible in the future for contractors to rob the State as they do at present. I move :

That the address be amended by the insertion of the following words, to stand as paragraph 3 :—“ We desire to express the opinion that your Excellency's Ministers should at once invite Parliament to appoint a Select Committee to inquire into the administration of public works in this colony.”

*His Honor* : I will now call upon you, Mr. Parkes, to address the Commission.

*Mr. Parkes* : May it please your Honor,—I will not occupy more time than is absolutely necessary in replying to the addresses of Mr. Andrews on behalf of Carter, Gummow, & Co., and of Mr. Smith on behalf of the Department of Public Works. With reference to the motives which actuated me in asking for this inquiry, and also the loss of time with which I am charged through not obtaining, in the first instance, necessary information, I think it must be apparent to your Honor that I used every possible effort which either a public man or a man in a private position in life could exert to obtain the fullest information upon the subject matters of this inquiry. Let me point out to your Honor the methods I adopted. In the first place, I heard certain rumours from certain contractors. I questioned them very closely as to what they had to complain of. There seemed to me to be a reasonable probability of the truth of their statements. I then took action in the House, and ultimately this Commission was granted. I may point out that when I made the first speech which has been referred to I asked that a Select Committee of the Legislative Assembly or that a Royal Commission might be appointed to inquire into the matter, to ascertain whether the representations made to me were true or not. That request was declined; but the Minister, at my instance, placed upon the Table of the House certain documents. I refer to the documents which were laid on the Table on the 22nd October. I perused those documents during the recess, or rather between the months of October and May. I found the papers to be in an incomplete state; and, by reason of that very incompleteness, I think they are calculated to give rise to suspicions in the mind of any public man anxious to discharge his duty. Looking at the schedule, for instance, of Contract 69 and 79A, and at the prices contained in the various schedules which were included in the papers; having regard also to the circumstances surrounding the letting of Contract 79, when Messrs. Bond and Hudson had been drawn off; having regard also to the circumstances surrounding the letting of Contract 77, and to the partial information contained in many of the papers which were supplied, confirming the information which had been given to me from outside; how could I, as a public man, do otherwise than ask and press for an inquiry? If I could have obtained information which established absolutely in my mind the fact that the allegations which were made to me were true, I should not have been likely—and I think, taking my public life, that that assurance may be accepted—to have asked for a costly Commission of Inquiry. But it was because it is impossible for a private individual to obtain information of the kind required, or even to ask for information—because it would have been persecution on my part to ask for information before this Commission was appointed—that I took the course I did. It is impossible for a private individual to discover, in a matter of this kind, what is really the state of affairs. I had assurances from certain men, coupled with information from certain documents; and I asked in Parliament for a Commission upon the avowedly incomplete information which I was enabled to put before the House. The Government, thereupon, acceded to my request, and granted this Commission. I naturally looked to the Commission to elucidate the truth or otherwise of the information which I placed before the House, but which I could not guarantee. If the information given to me turns out to be incorrect, if the doubtful matters appearing upon the face of the various documents can be explained away, then I shall be very pleased indeed—I shall be sincerely pleased. I can assure your Honor that I had no other object in view than the promotion of the public interest in bringing this matter forward. In bringing it forward in the first place I obtained the fullest information which it was possible for me at that time to obtain; and, the Commission having been granted, I naturally should not then go out of my way in order to search up matters upon which to condemn the department or the firm of Carter, Gummow, & Co. I, myself, certainly do not care to see men get into trouble. The only object I could have in view would be to remedy a state of things which was, to my mind, exceedingly detrimental to the public interest. If that object be achieved, I say that that is all that can be expected. It is not at all a pleasant thing to see men get into trouble, or to come to misfortune through bad actions. I am sure your Honor cannot accuse me of having during the conduct of this inquiry gone out of my way to persecute anyone, or of having shown any vindictiveness. In the investigation of these matters I have throughout adopted what seemed to me to be the fairest course possible. I, of course, had to make a searching investigation from my point of view, but I have not prosecuted that investigation in anything like a vindictive spirit. I now come to the second portion of the complaint which is made of me, viz., that I laid charges before your Honor without giving them due consideration. I fully realise the gravity of the position in which I was placed when this Commission was issued. I can assure your Honor that I really felt, within myself, that I ought not to appear before this Commission otherwise than as a witness; but Mr. Reid said “ Since you have the Commission it is your duty to assist

as much as you can in the conduct of its proceedings." That I have done. In appearing before your Honor in the first instance I wished only to place before the Commission my speeches, as delivered in the House, together with such information as I could gather during the course of the inquiry, and to ask you to determine upon the truth or otherwise of the various matters which were brought before you. But, as I explained to you at an earlier stage of to-day's proceedings, when making a certain application, Mr. Friend, the Secretary to the Commission, called upon me, by your Honor's direction, at the Legislative Assembly chambers, and informed me that your Honor desired that, if possible, certain charges should be put down in writing. I pointed out to Mr. Friend that if I followed the course which your Honor suggested I should in my opinion place myself in the position of a prosecutor, whereas I considered that I ought not to be placed in that position, for I take it that this is not a court in which there is a prosecution and a defence; it is simply a court of inquiry as to the truth of certain statements which I made in Parliament upon certain information given to me, and which I believed to be true. Your Honor can see that in accepting your offer that I should place certain fixed charges before the Commission I was putting myself in a position in which, as I well knew at the time, I should expose myself to censure and abuse if I failed to obtain the whole of the information which I expected to obtain. I would much rather not have done so; but as your Honor, on your part, explained that you did not consider these charges to be fixed charges, but that they were simply a basis upon which to ask for evidence, I put in the statements which have been before you. I do not think Mr. Smith should complain, in that I have been unable to prove or to sustain some of these statements or so-called charges which I have laid before the Commission. After all, the basis of inquiry by your Honor is the speeches delivered in Parliament, and had I allowed the inquiry to proceed in the ordinary way your Honor would still have had to inquire into the various matters contained in those speeches. It would have been necessary for you, for instance, to bring young Mr. Hickson round here from West Australia, because it would have been impossible for your Honor to avoid inquiry into the relations between that young man and Carter, Gummow, & Co. If I were to set down at all in certain fixed words the nature of the allegations I wished to be inquired into, I could not do it otherwise than in the words I have used. Your Honor will recollect that I was very careful in the first place not to put in the charge affecting young Mr. Hickson, until I thought the Commission would not bring him from West Australia, unless a definite charge was put in—in fact, Mr. Hickson, senior, objected to his son's coming. I thought that in the interests of truth, whether the inquiry went against me or for me, it would be better that this young man should come here and give his evidence as to the true state of affairs. As matters turn out, that branch of the inquiry is against me. Many of the witnesses whom I have brought forward have been against me; and I freely admit that the portion of the inquiry in which young Mr. Hickson is concerned is against me; but my action was one calculated to remove suspicion from Mr. Hickson, as far as that charge is concerned, if it was untrue. I do not think, therefore, that any great complaint lies against me upon that score. I come now to Mr. Smith's complaint that I was actuated by motives of hostility of a very curious nature to the heads of the department. I do not think that that insinuation is at all justified by the circumstances or by the statement which I frankly made to this Commission, in order that Mr. Smith might see to what extent I was actuated by public motives. Mr. Smith ignores altogether my statement that I was actuated by public motives; and he takes my statement that on my election in 1891 for East Sydney certain comments were made by property-owners and by taxpayers as to the costly and defective nature of the sewerage works in Sydney, and he has transformed it into a statement that I had around me professional men, engineers, workmen, and others, who wished me to practically destroy the department as at present constituted, with the object of conferring some ultimate benefit upon them. It is long since I was a Member for East Sydney, and I cannot see how it is possible for Mr. Smith to fairly draw such an inference. What good is gained even by referring to the notice of motion which Mr. Smith says that I gave in April, 1892, and which is referred to upon page 399 of the evidence.

- (1.) That, in the opinion of this House, it is expedient, for simplifying the machinery of Government, and for economy, that all the permanent professional branches of the service, such as engineering, surveying, architecture, law, and photography, shall be abolished, and the work performed by independent practising competitors, acting under instructions direct from the Minister under whose control the particular matter may be, and for whose advice a consulting officer alone shall be retained.

Presumably the head of the department would be retained. But the notice of motion is used by Mr. Smith to show that I wished to shift Mr. Hickson. That would be a wrong inference, because, even if the projected changes were made, it would still be necessary to retain a consulting officer, and Mr. Hickson might have been that officer. As regards the other officers, I may point out that in the department itself there are numerous officers who favour such a motion as that, because they think they would, by their natural abilities, put themselves into a better position if the opportunity for competing were afforded them. So that the motion was not directed to the injury—and I never had such an intention—of the officers

officers of the department. The idea was running in my mind that it would be a better course to give the Minister a better opportunity to attend to State matters, and with that object, to relieve him of a certain amount of official duty. The Minister being relieved of a great deal of the official duty with which he is at present charged, would, I thought, be able to devote a larger portion of his time to statesmanship. However, I am dealing with Mr. Smith's statement that I had motives of an improper nature—that I had unnecessary or unfounded suspicions. I think your Honor will at once acquit me of having been actuated by improper motives, and, as to my being over-suspicious in the matter, I would ask your Honor whether, if you were a public man, having read what was contained in the official documents from South Australia, you would not have come to the conclusion that things were not quite right there; because it is apparent from those papers and from Mr. Hickson's own admission, that, although he knew that certain contractors were sending their plans into the department, after he had arrived in Adelaide, the South Australian Government instructed him to prepare plans of his own, and not to accept these contractors' plans. Instead, however, of preparing plans of his own, he still allowed the contractors to make their second plans in his offices, the plans being made so imperfectly that any engineer of capacity would at once see this—that on their being sent to England for other contractors to tender upon those contractors would be absolutely thrown out of the work. The particular work for which the plans were drawn by the contractors afterwards went to arbitration—in fact, it came to grief; and Mr. Hickson then came across to New South Wales, having served only four years in South Australia, where he had been specially sent for from England. That in itself looked somewhat suspicious. Mr. Smith has also referred to matters which transpired in connection with the Public Works Committee causing me unfounded suspicion. I will point out to your Honor in a few words how justified I was in becoming suspicious that the public funds were being wasted—that they were being expended in an improper fashion. There was a proposal put before the Public Works Committee, when I was chairman of the Committee, to reclaim the greater portion of Darling Harbour, almost the whole of the portion above the bridge if I recollect rightly. When I came to look into the question I saw what an enormous amount of compensation would have to be paid in respect of water-rights, damage to property, interference with thoroughfares, the interception of traffic, the taking away of business from hotels and shops, and other things. It was very clear to be seen that a million of money would not have ended the undertaking. I saw that a determined effort was being made to have this work accepted at a figure which would not have covered more than one-fifth of the cost of it, and I therefore set to work to combat the proposal. In doing that, and in looking through the structure of the bridge which was the alternative proposal, I saw that there were very elaborate foundations. There were two bridges, one at Glebe Island and the other at Pyrmont. The plans of the department for the Glebe, Island bridge showed an inferior bottom. The bridge was of almost the same length, and the price was something like £89,000. The Pyrmont bridge, on the other hand, which would have to take almost the same traffic, was estimated to cost £220,000. I went carefully into the estimates, and I obtained the assistance of engineers, and it was quite evident that a bridge, lasting hundreds of years, could be built at Pyrmont for from £100,000 to £120,000. I intended to have the reports of the engineers submitted to Parliament, showing that the bridge would cost that amount of money, when a wooden bridge, which I considered most unsuitable for the site, was brought in, altogether blocking the proposed construction of the iron bridge, and evidently with that purpose. I came to the conclusion that the whole matter was one which certainly should not be allowed to go on. I am very glad to say that the reclamation has not up to the present day been carried out. The evidence tendered by Mr. Hickson at that time seemed to me to be of a very contradictory nature, and was quite sufficient to engender suspicion. No doubt I was perfectly justified in my suspicions. I come down to the present time, when these papers came before me, and when I had also before me the information of various contractors. I do not think the slightest exception can be taken to my conduct in asking, under all the circumstances, that these matters should be ventilated. As I have said, I shall be sincerely glad if it should turn out that the information which has been given me is wrong and that the documents quoted in Parliament can be properly explained away. I come now to the substance of this inquiry, and, in doing so, I would draw your Honor's attention to the fact that we have had some twenty-two contracts into which to inquire. Such an enormous amount of labour, seeing what it has cost to inquire into some four or five of the contracts, would be involved, that I do not think it could be justifiably entered upon. I have therefore abstained from going into many of these matters. I presume your Honor will not think that it is because I am in any sense fearful of the issue or of the justice of the inquiry that I have not gone into the whole of these other twenty-two contracts. I have not gone into them before your Honor for the simple reason that the labour involved would not in my opinion be justifiable. I considered that the four cases which I brought prominently before Parliament were sufficient upon which to base this inquiry. I have produced evidence, which I will presently emphasise, which affords conclusive proof that things are not as they ought to be in this great Public Works Department. I would ask your Honor, in the first place, whether one out of the four contracts which have been specially made the subject of inquiry has been obtained

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by honest, fair, straightforward, tendering. Take Contract 69. It was obtained by a schedule specially arranged, and differing peculiarly from any class of rigging which the department had theretofore known. It differed from any class of rigging which contractors had theretofore adopted, in as much as it constituted an absolute trap to obtain public money. That can be proved clearly by any fair-minded man who peruses the schedule. There was no intention in the framing of that schedule to ascertain the true value of the items in it. There was no intention to carry out the contract at a fair profit, but there was, on the other hand, a distinct intention to defeat competition by fixing the schedule in such a manner that, while it appeared that the accepted tender was £45,000, it came out really at £54,000. Such a tender as that, whether it be legal or not, could not be looked upon with anything like a condoning eye, and ought not in the first place to be entertained. If contractors are permitted, no matter under what system, to so fix their schedules that practically they receive, as did the contractors in this case, 500 per cent. and more over the value of certain articles, we have reached a lamentable state of affairs. I say that the tender, if it had been an honestly, truthfully, and faithfully, drawn tender—even allowing for the speculation which the contractors claim they were at liberty to make upon it, if there had been a fair speculation—would have offered no ground for complaint. Had there been an ordinary builder's speculation there would have been no reason to take exception to it, nor would I have done so. But it has been clearly pointed out that it was not so arranged, and I will deal with the matter more in detail in answer to the explanation of the department, as to their justification for accepting it, later on. I come now to Contract 77. Can it be said that that was obtained from the Government in a proper manner by fair tender? Under such circumstances the Government ordinarily say to contractors "We will treat you most honorably. We will prepare plans and schedules for every one alike. We ask you to give us the benefit of your experience and knowledge in submitting a tender for the carrying out of this particular work." The contractors generally responded to this information on the part of the Government in this particular instance. In the meantime Carter, Gummow, & Co. had an employee—because he can have been nothing else; he must have been an employee or a partner—one thing or the other—in the office. He obtained from the office-plans all the necessary information for the making out of a plan by which they could defeat the other tenders sent in to the department, and obtain an exorbitant value for their work. By this means they defeated the ostensible object of the Government—the obtaining of a true and fair competition for the work they were about to carry out. This is what these contractors succeeded in doing. No doubt such tendering could not be permitted in the public service unless it be publicly acknowledged that there is to be open competition both for the design and for the cost of the work, giving every man an equal chance. Let me come now to Contract 79. Can your Honor say that that was honorably obtained? In the first place, it was obtained by the contractors, Messrs. Carter, Gummow, & Co., proceeding to the successful competitors, and, as was proved conclusively by the evidence of Mr. Hudson, and also the evidence of Mr. Kenwood, endeavouring to so intimidate those men that they would be ready to throw up their contract, Carter, Gummow, & Co. then coming in in the position of second tenderers, with £3,000 of benefit, so far as their price was concerned. However, they could not intimidate these men, because they knew that they had an excellent price for the contract. There were very few competitors—considering the general run of tendering—for this particular contract; but Carter, Gummow, & Co. were £3,000 over the price put in by Bond and Hudson, and, knowing that, they had put enormous prices in their schedule, which was again in this instance rigged in the most improper fashion. They went, as I say, to Bond and Hudson, and, in the first place, tried to intimidate them, and, in the second place, bought them off for the sum of £1,700, including the amount which was paid to Kenwood. Then they persuaded the department to give them the contract at £3,000 over the lowest tenderer. The State must have been a sufferer to the extent of £6,000 by this back-door transaction, and I will prove to your Honor in what way. If you take the Parliamentary return and look at Contract 79, you will see from Bond and Hudson's tender that the excavation in shafts is put down at 30s., 50s., 49s., and 35s. The same excavation is put down in Carter, Gummow, & Co.'s tender, as you will see upon page 275 of the same return, at 78s., 83s., 79s., and 78s. If you turn to the last progress voucher upon this contract you will see that the excavation amounted to a considerable sum of money—to something like £9,000. Carter & Co. were paid at the rate of 78s. for this work, whereas if Bond and Hudson's tender had been accepted those tenderers would, in respect of that particular item, have been paid at the rate of 35s. As a matter of fact, the Government, by the non-acceptance of their tender, lost £4,000 upon that one item. The Government must have been, through the manipulation carried out by Carter & Co. in that transaction, defeated to the extent of something like £6,000 at the very least. Then what are the facts in connection with Contract 79A? That contract, also, cannot be said to have been obtained in a really proper manner. Perhaps very little exception can be taken to what was done, but the facts are that this firm of contractors obtained the services of a Member of Parliament and proceeded to work to get the contract, not at the contractors' tendered prices, but as an extension of Contract 79, upon departmental prices, the extension being a contract of a much cheaper nature. Now the extensions of

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contracts which have been submitted to your Honor as affording parallels to this case are in no way parallel, and for the simple reason that they were extensions given at the contractors' prices, which were at a great percentage below the departmental estimates. In those cases, had there been competition, it is very probable that there would not have been any lessening of the cost, but in the case of Contract 79A the work was let without any contest at all upon the items, and at the prices which had been put into the departmental schedule. Mr. Hickson, I am aware, explained this matter by saying that Mr. Lyne compelled him to accept this contract; but it was not a matter of compulsion, because Mr. Lyne and Mr. Young, who were both Secretaries of Public Works, have stated in their evidence that they were altogether actuated by the advice of their officers. And there can be no doubt that if Mr. Hickson had said to Mr. Lyne "Well, these are office values, and if you take my advice you will call for tenders"—if he had in any way pressed him at all, after Mr. Lyne had shown an inclination to give the contract to Carter & Co.—in fact, if Mr. Hickson had made the slightest effort to have the work put up to competition, as you would think a man in his position would do—no doubt that would have been done, and no doubt the work would have been carried out at an immensely cheaper rate; because, if you look at the prices in the schedule to the work, you will see that they are enormously strung out upon this, as upon all the other contracts upon which I have touched. I may as well speak now of Contract 72, into which your Honor has not gone extensively. Contract 72 cannot be said to have been a work properly carried out under the system of calling for competitive prices, and for the simple reason that Carter, Gummow, & Co. in undertaking the contract must have seen clearly that there was no outlet provided, putting them in the position of gaining enormously upon the additional excavation. They accordingly put in the enormous figure of 2s. 6d. per yard for excavation in country of a very soft nature, and 1s. for the removal of the spoil. They had hardly started the contract before they obtained a channel, which was 50 feet wide by 5 feet 6 inches deep. This had to be made in very soft soil, and they received 2s. 6d. per yard, and 1s. a yard for shifting the spoil a distance of 25 feet, or £4,000. If tenders had been called for this work in the first place, with everything in it complete, no doubt it would have been carried out at a very much lower rate. I will deal more fully with that contract later on. I wish to deal now with the question of defective work, and I would like to say that, although Mr. Smith and Mr. Andrews have done their utmost to show that the defective work upon these contracts is an insignificant thing, this Commission has not been one which has gone about breaking up works and looking for defects; but it has, in a most difficult fashion, called for such evidence as could be obtained as to defective work upon these jobs. Your Honor knows full well that the very fact of Mr. Carter's being acknowledged to be such a generous, good-hearted, man would render it very difficult for anyone to obtain evidence which would do him any injury. Since I myself have been sitting upon this Commission I have come to the conclusion that Mr. Carter is a good, kind-hearted, generous, individual. In fact, I do not think anyone could come to any other conclusion; and, as I say, you could not obtain evidence which would go conclusively to prove that Mr. Carter was in any way a man who did defective work. The evidence which has been brought forward here, such as it is, has not been answered. Limited as I admit that evidence to be, no reply has been made to it, and it would lead one to suppose that certainly, where small portions of defective work had been done, there are graver cases hidden in the background. Your Honor received a notification from the police which showed how difficult it was, in the case of a man named Tremaine, whom the Commission endeavoured to find, to get these men to come forward. That case illustrates the difficulty which one would naturally expect to be experienced generally in obtaining such evidence. The police said that there was great unwillingness on the part of the men to give evidence against their masters, and it must be apparent to any reasonable man that that would be so. Let me come to the cases of defective work which have been brought before the Commission. I will take the evidence of Inspector Melville, which evidence has not been touched upon by the opposite side at all. He gave conclusive and undeniable testimony, which had to be admitted by the department itself, that he caught Gummow, Gillan, & Co.'s men one morning putting the greatest muck—the most wretched rubbish—going by the name of concrete, down one of the shafts on one of their contracts. I think it was the contract running across Hyde Park.

*Mr. Davis:* That would be Bennett and Canty's.

*Mr. Parkes:* At all events, Mr. Gummow was connected with the contract. That defective work was found there there cannot be the slightest doubt, nor can there be any doubt that there was a man upon that work, named Shellback, who, according to Melville's evidence, although caught doing this very defective work—the worst class of defective work, cheating in concrete—was still kept upon the job. Coming further, we find this man Melville speaking of Reid, who has continuously had charge of Carter, Gummow, & Co.'s work. Melville said that he had constantly had to warn Reid, and that Reid was the kind of man who would have put in defective concrete wherever he could. He said that Reid was a source of considerable annoyance to him, and that he was constantly causing him trouble; that he considered him to be a man who would do defective work of any description if he got the chance.

Let



Let me explain to your Honor that there is in sewerage work but one class of work which could with any effect, as far as money is concerned, be cheated upon, and that that is concrete work, the saving being effected in the cement. All that a contractor could gain upon, in that particular class of work, would be the cement, and it is naturally, from its price, a thing upon which it is most valuable and important to gain, the material being used to a very great extent. If, for instance, a work takes 10,000 or 12,000 casks of cement, and the contractors can save 4,000 or 5,000 casks, they make a great saving, because each cask of cement is worth 10s. Whether you consider the evidence of Inspector Fowle, of Reid, of Hansen, of Melville, of Darcus, of Caughey, of Green, or of Chiene, it is alike conclusive as to the fact of there being an insufficient quantity of cement put into the concrete, and as to the concrete being loaded up with the cheaper material. Even Kady, a most unwilling witness, stated that upon Contract 77, where they should be putting in a gauge of 10, 6, and 4, they were really putting in a gauge of 12, 6, and 4. I asked him whether he would swear to that, and he said, "Yes." It must be remembered that this man was in the employ of the contractors. In that case each additional 2 feet of metal in the concrete was a saving of money. Others of these men have emphatically sworn to the concrete's being loaded with metal or sand. While speaking upon this point, I would point out that concrete must be good in respect of its component parts. If you are to have good concrete you cannot afford to load it up with sand and small material of different kinds. The real value of concrete consists in its forming a uniform binding material. The sand, therefore, should be of an even grade, and the cement should be truly and properly distributed. It is held by the best authorities on concrete that coarse sand should be used, because when properly surrounded by cement in the interstices it goes to bind the concrete together. Close, loamy stuff, on the other hand, will leave the cement patchy here and there. It must be admitted that the only bond in concrete is that resulting from the use of good cement, combined with a proper, crisp, hard sand. I would like, in connection with this question of defective work, to refer your Honor to the most emphatic letters which have been put before the Commission, from which it would appear that inspectors have complained bitterly of this man Reid and of other men, and I also wish to point out that Mr. Davis himself has admitted that he has had to remove two inspectors from the works of Carter, Gummow, & Co. because the work was being improperly carried out under them. I submit—and I do so from a considerable amount of experience—that when you find contractors and contractors' men, in a small degree, and after limited searching only, inclined to cheat, you may rely upon it that they have done it to a greater degree. This brings me to Contract 79 and the evidence of Dawson. It is all very fine and nice for the contractors and for the department to trump up a tale about Dawson, and to bring circumstances to bear to prove that this man did certain defective work because he had a spite against the contractors. The first question he was asked by me when he came to me was, "Are you on Carter, Gummow, & Co.'s works now?" He said, "Yes; I am working now with them. I am working at Annandale." I pointed out to him very clearly that he would be for ever, as far as Sydney was concerned, blackballed by all the contractors as regards work; but he still said to me that he considered it his duty to point out this particular defective work. He said that he had done it some two or three months before, and that he had been considering whether he ought properly to call upon me and give me the information or not; that finally he had come to the conclusion, as a conscientious man—seeing all the things that were said about Carter, Gummow, & Co. and other contractors—as a matter of public duty, he ought to give me the information. Dawson is not a foolish man, and I put it to your Honor whether, knowing the position in which he would put himself, he would have come to me at all had he not been actuated by some strong impulse, that impulse arising from his conscience. It is possible, surely, that in a working man there may be such a thing as conscience. I believe from Dawson's frankness and openness—he said that if he got into gaol for it he would give me the information—from his knowing that in giving me the information he could be only injuring himself, he could not have come to me with a wish to injure the contractors. What would be his object in injuring the contractors? They were giving him work. He had been working for them for eight years or more, and they had invariably given him a good character, as do the inspectors and his fellow workmen at the present time. I think that even Reid, the manager for Carter, Gummow, & Co., gave him a good character. Dawson was working on and off for this firm for eight years. He admitted that there were periods when he had not been at work; but would he, in consideration alone of the fact that he had not been at work for one fortnight, commit an act which was calculated to injure employers with whom he might have remained for so long a time? Mr. Gummow said in his evidence that he employed the man because he considered that he was a good workman—that he was a useful man to the firm. He received wages which were enormously large for this period—8s. a day. Those are not wages which a man is likely to complain of. I believe the man had as frank and open and straightforward an object in coming to me as ever a man had, and that was to disclose the bad work he had been doing. That which he had in his mind, no doubt, was the wrong he had done. I said to him—and it must be apparent to anyone that such must have been the case—"You must have done bad work formerly." He said "I have done bad work formerly, but I could not locate it now." I asked

him whether he could not recollect where it was, and he said he could not lay his hand upon it at that lapse of time. He said, however, that there was a shaft on the job running through Camperdown—he could not remember the number, but he said he could walk to it—where there was defective work. He said, also, that there were other portions of the work which he could point out as having been done defectively a long time ago. Among other work he located that at North Shore, and your Honor put him through a close cross-examination to see whether he had actually marked the spots. To show you how little foundation there was for such a supposition, he said he knew where these spots were by the measurements of the Government engineers themselves. To show you that he could not have marked these spots—and had he wished to put the contractors away he would probably have marked them—the largest drum left unpacked upon Contract 79 has, according to him, not yet been discovered; he could not find it. Two unpacked spaces have been found by Professor Warren and by Mr. McCredie. Another space was afterwards found by Mr. McCredie himself. Dawson says, however, that there was still another unpacked space which was not found by these gentlemen. Mr. Andrews said that no important defects were found, but Mr. McCredie said he found various small holes where the bricks had been knocked up to the crown of the rock excavation—that it was possible that there may have been a great deal of the rock right down on the brick, but that, in some cases, he pushed up the bricks 1 inch, showing that there was no packing behind them. He assumed from this that there were some small holes in addition to the larger ones which he mentioned. Dawson went on to disclose bad work which had been done by a man named Hansen, and although Hansen, at first, denied having done bad work he ultimately admitted, on further examination, that the work was not of a character which could be considered good. Dawson said that cavities were left by Hansen on a section on which he worked on the High-street branch. I would point out to your Honor—I cannot avoid doing so—that it is a very suspicious circumstance that at an early part of this inquiry an inspector of the department, Inspector Board, should have spoken to Hansen, and should have asked him to alter the position of some shafts he had named in his evidence. The fact that the leaving of these cavities was not a new affair to Carter, Gummow, & Co., was clearly disclosed by the letter which I asked Mr. Davis to read—one of his own letters, showing that a 9-foot cavity had been left upon the Waverley contract some time previously. Inspector Vincent, it will be remembered, was dismissed for allowing that defective work to be done. What deduction can be drawn but that there was other work of the kind going on? The evidence shows that that kind of work was going on generally, and we know that there is no possibility of discovering it, under ordinary circumstances, when the brickwork has been once put in. I do not believe from the evidence which has been given before this Commission by Professor Warren and Mr. McCredie, by the departmental engineers themselves, by many witnesses—I do not believe it would be possible to tell whether a cavity had been left behind the brickwork by simply tapping it. Probably a certain amount of defective work has been done which will never be discovered. On the other hand, time may reveal the extent to which it has been done in an unfortunate manner. But that there has been defective work upon these contracts of Carter, Gummow, & Co., even in the limited number of contracts we have looked into, must be considered to have been proved to the satisfaction of every reasonable man. The great feature in the defective work upon these contracts would naturally lie in the shortage of cement in the concrete portion of the structures. There would be nothing else practically upon which scamping could be done. A very careful search has been made under the direction of this Commission into the Bank pass-books of Carter, Gummow, & Co., in order that it might be ascertained from whom they bought their cement. Mr. Christie, who has given evidence before the Commission on various occasions, has instituted a very careful search through the books of the merchants from whom the firm have purchased their cement. Mr. Carter, in his evidence, admitted that he did not borrow cement from any other contractor. As your Honor will see, he has admitted that every one of the cheque payments to cement merchants have been in the name of the payee. He admits that they sent a certain quantity of cement from one contract to another, and that a certain quantity has been sold. For instance, Mr. Carter admits that he has sold cement to the extent of 1,400 casks. He says the firm sold to Danaher, Taylor, and Britten, 600 casks; that they sold to Flood 800 casks, and, out of the purchase of Carson, no doubt 200 casks. In addition to this, Mr. Carter admitted that he has given cement for which he does not know whether he received cash or a return of cement. I will deal now with the researches which have been made by Mr. Christie. It will be clearly seen that the total of 13,431 casks of cement which have been ascertained to have gone to Contracts 79, 79A, and 69, must have been the sole cement which went to those works. In the first place, I would point out to your Honor that there is only one way of showing that more cement than those amounts so purchased went to these jobs, and that would be by showing that it came from other contracts. Now when Contract 79 was let in 1892 the only other contracts then in the hands of the firm which were going on were Contract 72, and that was starting at its second portion, the Waverley contract, and the Glebe contract. These copies of the merchants' sale-notes and the deliveries

which

which have been handed in to the Commission as Appendices disclose the fact that very small parcels of cement were being sent to Waverley and the Glebe job, which were completed at an early period of 1892. Parcels of 50, 100, or 120, casks were sent, proving conclusively that there could have been no stock upon those contracts towards the completion of the work. To show that in the case of the Waverley job there was no cement in stock at the latter end of the job, I may mention that such parcels as 15, 20, and 12, casks—it might be only one dray-load at a time—were sent there, towards its completion, from Contract 72, totalling altogether 208 casks. I come now to Contract 79, which was carried on as a solitary contract until Contract 69 was started in January, 1894, the contractors then having no other work in hand. Contract No. 79 was completed in October, 1894, and no cement came on to the works in the case of Contract 69 until eight months after it started, the completion being in October, 1895. Contract 118—the Johnstone's Creek contract—started on 24th May, 1895, but the first cement delivered from Parbury, Henty, & Co., as you will see from the papers, was on 10th September, 1895. Therefore, no cement could have come to Contract 79, and it could only have gone to 79A. A small portion might have gone from 69 to the Johnstone's Creek contract, but that does not affect our contention at all. We have a witness here named Burcombe. I knew that he was to be an adverse witness before I brought him here. He came here, no doubt, with a set purpose. Now he has sworn that he took 2,000 casks of cement—1,953 casks, I think, was the number—from Contract 72 to Contract 79 at the time of the suspension of Contract 72. Let me point out to your Honor that Contract 72 was suspended in October, 1891, and that Contract 79 started in March, 1892. No cement was delivered upon Contract 79, as is shown undeniably by Inspector Fowle's report and the contract journal, until twelve months afterwards, or in May, 1893. Your Honor, from your own great reasoning powers, must see the absurdity of evidence which says that three three-horse drays could deliver the alleged quantity of cement from Shea's Creek to North Shore, going by punt and making three trips a day, taking twelve casks of cement on each trip. That Burcombe should have employed three drays, making three journeys a day and carrying twelve casks of cement at each journey, is beyond all reason.

*His Honor*: The witness, in using the word "punt," I presume, meant the horse-ferry?

*Mr. Parkes*: Quite so, your Honor. It is evident, I think, that no cement came on to Contract 79 until May, 1893. Inspector Fowle's evidence is quite conclusive on that point.

His Honor, at 1.5 p.m., adjourned the inquiry until 10 a.m. on Tuesday, 6th October.

C. E. R. MURRAY,  
Commissioner.

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TUESDAY, 6 OCTOBER, 1896.

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Smith (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising); attended.

Mr. J. Davis, Principal Assistant Engineer, Sewerage Construction, and Mr. Norrie, bond clerk, also attended.

Francis Antill Pockley, William Valentine Miller, George Lyell, and Frederick Joseph Cabill, were sworn and examined.

Frank Moorhouse Gummow, John Carter, and Joseph Davis, were recalled and further examined.

*Mr. Andrews*: With reference to witnesses as to Mr. Carter's character, we can produce a number more if your Honor deems it necessary.

*His Honor*: I think Mr. Parkes has practically admitted himself that the evidence tendered is indisputable as to Mr. Carter's liberality.

*Mr. Parkes*: I would not go out of my way to find evidence to dispute it, your Honor. I will at once admit it. Naturally, men would not come here to give a bad character to Mr. Carter; men will always come to say the best they can about a man of that kind.

*His Honor*: The question is, whether it is not a fact that Mr. Carter happens to be, naturally, a man with an idiosyncrasy.

*Mr. Parkes*: I admit that, your Honor.

*His Honor*: I will now call upon you, Mr. Parkes, to continue your address.

*Mr. Parkes*: When your Honor adjourned the inquiry on Friday last I had pointed out that there was only one contract from which it was possible for Messrs. Carter, Gummow, & Co. to have taken  
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cement to their contract at North Sydney, viz., No. 72. In that connection I have first of all to direct your attention to the minute of Mr. Engineer Boys, the Supervising Engineer upon Contract 72. His minute appears upon page 631 of the evidence, and is to this effect:—

Messrs. Carter & Co. have informed me that they have stored 2,000 barrels of cement on the Munnistreet to Shea's Creek Contract, and require it to be tested. This quantity is in excess of the amount required to finish the present work, and I have refused to bring the samples.

That shows that there would have been a surplus of 2,000 barrels after the stoppage of the work at Macdonald-street. At all events there is clear evidence before your Honor that work was still going on on the contract in January and February, as certificates were issued in each of which an addition was made to the item of cement rendering. That work must have consumed a certain portion of the 2,000 barrels of cement. Coming to Mr. McCredie's and Mr. Thompson's evidence, on the vouchers which appear in connection with the second portion of Contract 72, it is shown by these gentlemen that this quantity of cement was necessarily required, and would have been consumed. But if we take the evidence of Mr. Davis and compare it with Mr. Christie's evidence as to the quantity of cement supplied by Parbury, Henty, & Co. to this job, after the continuation of the second portion, it will be found from Mr. Davis' evidence, if worked out upon the totals of this addition, the quantity used, and the quantity supplied by Parbury, Henty, & Co., that the quantity remaining would come out at something like 1,500 barrels upon the completion of the contract. Evidence is before the Commission that Flood, from December, 1891, to June, 1892, paid for from 600 to 800 casks. It will be seen from the evidence of Mr. Carter upon page 211, also, that Danaher, Taylor, and Britton bought 600 casks; and Mr. Christie's evidence upon page 587 shows that 208 casks were sent in December, 1891, across to the Waverley contract, which was then completing. It will be seen, therefore, that 1,500 casks of any surplus which may have existed was consumed by these sales and by deliveries to the Waverley contract. I come again to Burcombe's evidence, upon which I commented on Friday last. He told us that he took 2,000 casks of cement from Contract 72 to Contract 79, and that he took it at the stoppage of the contract, when Mr. Hickson gave his notice of October, 1891. Now the peculiarity of Burcombe's evidence is this: he says he took three dray-loads three trips a day for three weeks, with twelve barrels to each dray. Working it out at six days a week, the quantity comes to almost exactly 2,000 casks, which, according to Mr. Boys' letter, were upon Contract 72. I wish to point out to your Honor that this cannot be true. It is simply impossible, in the first instance, that the alleged quantity could have been carried by Burcombe, as the distance would not permit of it. Then, again, the sales show conclusively that this quantity of cement had been disposed of. If the 2,000 barrels had been shifted at the time at which Burcombe says they were shifted, then we are brought face to face with the fact that Contract 79 was not even then let; for we are told—and the papers prove it—that it was not let until March, 1892. It follows, therefore, that the cement sheds could not have been upon the job, since no contract existed. Then there is the conclusive evidence of the returns which Mr. Christie has produced before this Commission—that the first delivery of cement upon Contract 79 was 999 casks which were delivered by Parbury, Henty, & Co., and advanced upon by the department in certificate No. 14. Now, I ask your Honor to consider whether, in all reason, supposing that 2,000 casks had been taken across to North Shore even at the completion of Contract 72—and having regard to the fact that an advance was so much wanted at that particular time, as has been pointed out during the course of this inquiry—an advance would have been given upon 999 casks or upon the 2,000 casks, which must have been stored for some time—nearly eighteen months—upon the contract if what is said be true. Let me refer your Honor, in this connection, to Inspector Fowle's evidence. He went upon this work in June, 1893. He has come before this Commission and has produced a carefully-kept notebook, and from that notebook he tells us that, when he took delivery of the works from Superintending-Engineer Boys, there were 850 casks of cement stored upon the contract. On the 11th October, 1892, there was an advance made under Superintending-Engineer Boys' certificates Nos. 13, 14, and 15, on 870 casks—upon the delivery of Parbury, Henty, & Co. When Mr. Boys made his report, the delivery had been 999 casks. This cement had been delivered on 21st and 24th October, 1892. This will be seen from reference to Parbury, Henty, & Co.'s accounts. Superintending-Engineer Boys has made an entry as to this cement in his contract journal, and I should like, at this stage, to have your Honor's permission to put in as evidence the journals to which I shall refer, and also the Inspectors' reports.

*His Honor:* Very well.

*Mr. Parkes:* Superintending-Engineer Boys' entry in the contract journal is under date of 15th May, 1893, and it appears from that that 130 casks were sent to Contract 90. The Inspectors' daily returns have already been quoted to this Commission by Mr. Davis, and they show that the cement used up to that date, from the very first use of cement, would be 16 casks. That would leave the 853 casks referred to in Inspector Fowle's evidence and quoted from his notebook. It seems to me to be absolutely conclusive on this point—it cannot be answered, and it also corresponds with the 870 casks advanced upon by  
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Superintending-Engineer Boys in his certificates 13, 14, and 15. I come now, your Honor, to the exact notes which were made by Mr. Fowle, not only at the moment of his going to the contract but also a month afterwards, and those notes are accounted for in this way. There were from 850 to 860 casks on the job when he took charge. The delivery of 300 casks by Mr. Try would make in all 1,150 casks. If you look carefully at the inspectors' daily returns, and if they are to be relied upon—and I presume they may be for the purposes of this argument—you will see that there were about 300 casks used up to that time, so that on the date of the 21st July—the date of Inspector Fowle's report—there were 1,150 casks on the works, that is, the 850 and the 300 casks. Between the date of his going there and the date of his making this note there were 300 casks used, which would leave the 850 casks which Inspector Fowle entered in his notebook. The cement tests also prove this because they coincide with and endorse the sale notes and the particulars taken from Messrs. Parbury, Henty, & Co.'s ledger. They endorse the information laid before the Commission by Mr. Christie in his evidence. The next test, according to the departmental book, which took place was of Wouldham cement coming from Parbury, Henty, & Co. on 30th June, 1893, 500 casks, and that also coincides with Inspector Fowle's report. The next test was 500 casks of Germania, and that also coincides with Inspector Fowle's report. He gave other particulars as to 180 casks which was portion of the parcel delivered by Henry Austin and charged as 1,002 casks. We come then to the 69 casks from the storm-water canal. It is possible that this may have come from Contract 69, but it is more likely that it came from Contract 78, a small contract at Long Cove, completed in the previous March. It will be seen that this entirely does away with the idea of Burcombe's having at any time taken across cement from Contract 72. There is no doubt that the residue upon that contract was sold in the manner I have pointed out. Here let me direct your Honor's attention to Mr. Davis' memorandum which is contained upon page 631 of the printed evidence. I might point out that Mr. Christie, who made the researches into the purchases of Messrs. Carter, Gummow, & Co. and Messrs. Carter & Co., has produced before this Commission a return showing the purchases from merchants which cannot be disputed. Mr. Henty was brought here with the object, I presume, of showing some little variation in the information produced before the Commission; but all that he could point out was some little discrepancy as to the actual delivery of some of the cement, which was afterwards satisfactorily cleared up. We find ourselves therefore in this position—that there was only delivered, after the completion of Contract 72, and from the commencement of Contract 79, to Messrs. Carter & Co., from that date to June, 1896, 21,000 casks of cement. Of this, as shown in Mr. Christie's evidence, 13,432 casks were delivered to Contracts 79, 69, and 79A. In answer to that statement Mr. Davis prepared a statement—very cleverly arranged no doubt, but which will not hold water—in which he took the inspectors' reports to begin with; and, at this stage, I should like to draw your Honor's attention to his own evidence. In reply to a question by Mr. Norrie, Mr. Davis said that very little reliance could be placed upon the Inspectors' reports.

*Mr. Davis* : I did not say that.

*His Honor* : I think that what Mr. Davis said was, that they might be relied upon up to about 5 per cent. or so of the quantity.

*Mr. Davis* : That is what I said, your Honor.

*Mr. Parkes* : We will allow that there may have been an error of 5 per cent. But let me show, your Honor, how Mr. Davis has made up his calculation. He has taken the inspectors' reports as being final only as to the quantity of cement used, and he has taken Mr. Christie's figures as being correct. For instance, he has taken the 13,432 casks, and has added to that number that 2,000 odd casks supposed to have been taken from Contract 72. That is the way in which he compiles his figures, and defends this charge. The quantity, according to the inspectors' reports, he runs out at 15,619 casks. The line he has taken is to show that on Contracts 69, 79, and 79A, there was a certain amount of concrete used upon the basis of one cask of cement to 22 feet, in the case of bluestone concrete, and of one cask of cement to 27 feet of sandstone concrete. He works this out in a return which is shown upon page 631. I will now make a comparison between the inspectors' returns worked out upon that basis, if that is the basis upon which the department has gone, and also upon the daily records, to show what a terrible inconsistency there is between these two statements. According to the inspectors' returns upon Contract 79, there were 5,383 barrels used. Mr. Davis works out the quantity, upon his basis, at 4,692. In Contract 69, however, upon Mr. Davis' basis, there were 8,387 casks of cement used. Upon Contract 69, upon the basis of the inspectors' reports, there were only 7,965 casks used. Upon Contract 79A, upon Mr. Davis' basis, there were 2,571 casks used, and upon the basis of the inspectors' returns 2,269. But greater discrepancies come in when you come to look at the different material to which these estimates were applied. Take concrete, for instance: The inspectors' returns for Contract 79 show that 2,569 barrels were used for the concrete. According to Mr. Davis' estimate, for the same contract, 3,992 barrels were used in the concrete.

concrete. In the brickwork upon Contract 79, according to the inspectors' returns, 2,158 casks of cement were used, and according to Mr. Davis' basis, 162 casks. In the cement facing upon the same contract, according to the inspectors' returns, 421 casks were used, and, upon Mr. Davis' basis, 488.

*Mr. Davis* : If your Honor will allow me to interrupt, I should like to make an explanation. Mr. Parkes is arguing upon a fallacy.

*Mr. Parkes* : I listened without making any interruption to the address of Mr. Smith, and I think that the least I am entitled to expect is that I, also, should be heard without interruption.

*His Honor* : Properly speaking, there is no right of reply to Mr. Parkes ; but if certain matter comes in—new matter which has not been touched upon by way of argument—I shall allow an explanation to be made at the close of Mr. Parkes' address, and I shall possibly allow Mr. Parkes, if necessary, to comment upon the explanation. Of course if you think, Mr. Davis, that Mr. Parkes is in any way mis-stating the evidence in the course of his address, you are right in objecting to the mis-statement.

*Mr. Davis* : What I say is that the return of which Mr. Parkes is making use has not been put in in evidence. Mr. Parkes is making, I do not say intentionally, an improper use of the return. In the return for the brickwork it has been customary for the inspectors always to give the quantity of cement used in the concrete packing, inasmuch as the bricklayer uses that cement. For that reason, therefore, I say that Mr. Parkes' argument is based upon a fallacy.

*His Honor* : Do you make that statement as a matter of evidence, Mr. Davis?

*Mr. Davis* : Yes ; and I say that, inasmuch as this return has not been put in as evidence, Mr. Parkes ought not to use it in the manner in which he is doing.

*Mr. Parkes* : The return has been put in evidence, and will be printed as an appendix, I understand.

*Mr. Davis* : It has not been put in as evidence to my knowledge. All that we have put in as evidence has been the tabulated results.

*His Honor* : If a detailed examination has not been made by you of this return, Mr. Davis, I shall allow you to make it, of course, so that you may be clear as to the results. It would take me a long time to go through the whole of these things, but I am afraid I shall have to do so in order to see whether these arguments are well-founded. It would be of great assistance to me if you would do so in the first instance, and we should then see what conclusions of fact you drew from them.

*Mr. Parkes* : I should like to have the return produced now before the Commission. A copy, I understand, has been made by Mr. Davis, and a copy has also been made for the use of the Commission.

*Mr. Davis* : What I say is that the return is no doubt compiled from the inspectors' returns, and that no doubt they correspond ; but, at the same time, the return does not bear the construction which Mr. Parkes places upon it.

*His Honor* : You say, Mr. Davis, that the return does not, in fact, show a distinction between the cement used in mortar and the cement used in the concrete packing, because these two things have been constantly put together in the inspectors' returns.

*Mr. Davis* : Yes ; and it would be utterly impossible to keep them separately, and for this reason : one bricklayer might use from a cask of cement two-thirds for packing and one-third for brickwork, or it might be the other way about.

*His Honor* : The two classes of work would most likely go on together, and, as far as I can see, it would be obviously impossible, Mr. Parkes, to distinguish between the two uses for the cement.

*Mr. Parkes* : There is a difference, your Honor, between brickwork, rendering, and concrete.

*His Honor* : The rendering, of course, can be kept separate, because it is done separately after all the brickwork is finished.

*Mr. Parkes* : So also is the bluestone concrete.

*His Honor* : It is the cement used in the sandstone concrete and in the mortar which I understand is mixed up together.

*Mr. Davis* : Yes.

*Mr. Parkes* : I protest against these interruptions to my address, your Honor, on the part of the department. I listened with every attention to Mr. Smith, and I think the same courtesy should be extended to me.

*His Honor* : If there be any wrong conclusion of fact upon which an argument is founded, it is quite legitimate that it should be pointed out as a fact.

*Mr. Parkes* : I heard many wrong conclusions, your Honor, during the addresses of those who preceded me, but I did not interrupt the speakers. *His*

*His Honor* : You had a right to do so, Mr. Parkes.

*Mr. Davis* : I had no wish to interrupt Mr. Parkes. I only desired to do what was right in the matter. I did not wish Mr. Parkes to draw false conclusions.

*Mr. Parkes* : Taking the concrete, the brickwork, and the cement facing, there is an enormous difference between the brickwork and the cement facing, the figures being respectively in the case of Contract 79, 2,158 barrels and 421 barrels, making a total of 2,579 casks. Compare this with Mr. Davis' totals of 162 casks for brickwork and 488 casks for cement facing. It will be seen that there is a great discrepancy. Then take the concrete : According to the inspectors' returns there should be 2,569 casks, and upon Mr. Davis' basis 3,992 casks. But putting the details aside, and taking the totals, Mr. Davis' total upon Contract 79 is 4,642, and the inspectors' total 5,384. Then take Contract 69. According to the inspectors' return there should be 7,965 casks, and upon Mr. Davis' basis 8,387 casks. If the inspectors' returns were accurate within 5 per cent. the necessary quantity of cement cannot have been supplied to Contract 69. That is clear upon Mr. Davis' own showing. But there is this peculiar thing which I want to point out to your Honor. Mr. Davis and other officers of the department have given evidence—not documentary evidence, but merely statements of their own—that the practice of the department has always been to put cement down as going at the rate of one barrel to 22 feet of bluestone concrete and one barrel to 27 feet of sandstone concrete. Now, if that be so, how comes it that the department, in making its own estimate of this class of material, should, upon Contracts 79, 79a, and 69, put in as their computed values 30s. for sandstone concrete and 50s. for bluestone concrete? Take Contract 77, in connection with which they submitted their own estimate for this contract to the Commission, you will see the price of concrete is there also put in as 50s. for bluestone and 30s. for sandstone concrete. If you take the proportions and pay for the value of each component material at the departmental value the sandstone concrete will be found to be worth only 19s. 6d. and the bluestone concrete only 31s., if you allow upon the basis of Mr. Davis' estimate that only one cask goes to the proportions given. That, I contend, cannot be denied. Concrete is not like other things, at the value of which you might jump, but it contains certain set materials which have a market value. It runs truly in its proportions, and there is no difficulty whatever in arriving at a conclusion as to the value of a yard of the material; but, as I have shown, according to the two estimates, there is a difference in the value of the sandstone concrete as between 19s. 6d. and 30s., and as between 31s. and 50s. for the bluestone concrete, according to the departmental estimate. That conclusively proves one of two things—either that they put a false value upon the materials or that they estimated them approximately on the basis of the proportions put forward by Mr. McCredie and Mr. Thompson, which, I contend, is the correct basis. Evidence has been put before your Honor—not documentary evidence or evidence from tests or anything of that sort—but evidence fixing these proportions; but I have, as against that, submitted to the Commission Mr. McCredie's and Mr. Thompson's double tests, which were most carefully made. There can be no doubt that that was the case—that they were not made with any intention of biasing the Commission in that way. According to these tests they computed the quantity of cement to be used upon contracts 79, 79A, and 69, as being 21,600 casks. Mr. Gilliver, another contractor who gave evidence, was also a practical man, and has probably had as much sewerage work to carry out in the Colony as has any other contractor here. He has given evidence to the effect that the proportions of cement to the bulking of the work are 1 to 19 for bluestone concrete and 1 to 24 for sandstone concrete. If the quantity required for these three contracts is worked out from that basis you will find that 18,532 casks would be required. Mr. Rhodes, another contractor, has also given evidence upon the point. Here let me say that these witnesses have come here, connected with the department as they are, doing work as they are for the department, and that there was certainly nothing which I could give them to encourage them to come. They have come here, as I say, expecting everything in the way of grace from the department. They having given their evidence with this freedom, I will ask your Honor to consider whether some value ought not to be attached to it. According to Mr. Rhodes' calculation the quantity required would be 18,171 casks. Mr. Butcher, whose evidence will be found on page 371, is another contractor who has carried out a considerable quantity of sewer work. According to his estimate the quantity required would be 18,040 casks. Mr. Davis, himself, gives a table of proportions upon page 631, from which it will be seen that the quantity is 15,600 casks. Now it is conclusive to my mind—absolutely conclusive—that there could have been no cement whatever taken from Contract 72 to this contract. It is quite evident, from documentary evidence which has been submitted to the Commission, that the total quantity supplied to the contracts 79, 69, and 79A, was only 13,431 casks. The particulars which make up that total are taken from the books of those who supplied the material. The cement could not have been taken from Contract 72 at its suspension, for the simple reason that these three contracts were not then in existence. On Friday last I pointed out the dates on which each of these three contracts was commenced and was completed. I took those particulars from the records. The particulars appear in the evidence itself, as well as in the various appendices, and,  
according



according to them, there would be—even according to Mr. Davis's table, which appears upon page 631—a deficiency of something like 2,200 casks. According to the evidence of many independent witnesses, the deficiency would be very much greater. How can it possibly be argued, upon the evidence which has been put before your Honor, that there has not been a systematic saving of cement throughout the various works upon these three contracts. I might point out, also, that, although Mr. Davis stated that the inspectors' returns were to be relied upon within about 5 per cent., Mr. Roberts, the cement tester for the department, in reply to Mr. Davis, who was at that time also anxious to shake the inspectors' returns, said that very little reliance could be placed upon them. The answer to question 9630 shows that pretty conclusively. While referring to the office records, I might also draw attention to the fact that the certificates given for tested cement upon these three contracts show a total of only 11,740 casks. There can be no doubt whatever that these were complete certificates, because they tally exactly with the books produced by Mr. Roberts, the cement tester to the department. Now we come to the grand total given. It might be argued—in fact it has been stated before this Commission—that cement is taken from job to job, that it was changed about from place to place wherever contracts might be starting or finishing. This could not have taken place to any great extent, having regard to the dates of starting and completion of the several contracts with which I am dealing. No. 79, for instance, is an isolated contract; and if you come to consider the whole of the contracts you will find that there would have been no great interchange of cement between them. As to the taking of any cement from the Annandale job, there could only be one contract to which, from the dates of starting to completion, it could have been supplied, and that would be Contract 79A. The contractors had delivered 1,200 casks of John Try's cement, which, according to Mr. Roberts, had been condemned, and it will be clearly seen by your Honor, if you look at the inspectors' returns, that it would be absolutely necessary for the contractors to use every available cask which was there outside of the condemned cement, excluding the condemned material of John Try. The total required for Contract 77, according to Mr. M'Credie's evidence, would be 3,464 casks, and for Contract 118, 8,144, there being purchased and delivered for these jobs 7,770 casks, as will be seen from Mr. Christie's evidence setting forth the purchase. I might here refer to a curious coincidence. I do not put it forward as an argument; but, if it be true, as Mr. Davis says in his memo. having reference to the change of schedule upon Contract 79, that there was a saving of 1,300 yards of concrete—concrete that had to be used on the job but not paid for—then, according to Mr. Davis's own statement, it ought to appear that at least 500 or 600 casks were not allowed in that particular quantity, his total being therefore increased to that extent. Now, having pointed out these facts as they appear from the evidence, I will come to the nature of the testimony which has been given as to the saving of cement. It must be admitted that numerous witnesses have come before this Commission who have all coincided in their evidence as to the various methods of cement saving upon the very limited number of jobs into which this Commission has inquired. Take Dawson's evidence first of all. Before going into the details of his evidence, however, I should like to point out that reflections have been cast upon him; and, with a view to shake his testimony, it has been stated by several witnesses that he made threats against these contractors. Two men, Hart and King, have been brought here in order to prove that he stated to them that he intended to put the contractors away, to make it hot for them, or something of that sort. Dawson, in his evidence, says that he did not say that, but that he thought this sort of cheating on the contracts of Carter, Gummow, & Co. should be put a stop to, it being his intention when the proper time came—by which, I presume, he meant the inquiry which was then anticipated—to expose the nature of the work which had been done. In complete answer to this charge brought against Dawson, in connection with which an emphatic endeavour has been made to show that he did this work of his own accord and without Manager Reid's knowledge, I should like to quote Reid's evidence upon pages 153, 154, and 155. Mr. Gummow elicited this evidence from him:—

5685. You have said that you heard Dawson had said that bad work was done—that he had left some bad work, and that he had made some threat about giving the company away? Yes; he said he would put the company away. Those are the words I heard.

5686. Did he ever come to you for blackmail? Never.

5687. He was off the job for nearly a fortnight, you say? Yes.

5688. Did he ask for full pay for that fortnight? No.

5689. When you heard of this bad work was the contract still in the company's hands? Yes.

5690. Could the company have got this work put right if they had thought it was there? Very easily.

Reid formerly had given evidence to the effect that Dawson told him that he intended to put the company away on account of this bad work, and, in answer to Mr. Gummow, he admits that, before the contract was handed over, and not long after the work was done, he knew all about it, and did not tell the contractors anything at all about the matter. Had he done that the work could easily have been put  
right

right. Now, is not that most conclusive as showing that Reid must have known that defective work was going on. If he had been a man of a different description he would have instantly said "Dawson has told me that this bad work has been done; and it ought to be put right." Upon page 154 of the printed evidence it will be found that Reid, on being further examined, said :—

5768. How long would it take a bricklayer to build a succession of drums 14 feet in length? I could not say. I never timed them.

5769. Would it take half a day? No.

5770. How long would it take them? A good man could do eight drums a day.

5771. It would take some hours? Yes.

5772. What would Connors be doing during the time Dawson would be leaving the space open? He would be pointing his work up and cleaning it down.

I may mention that each drum would be 2 ft. 6 in. From Mr. Davis's own evidence it will be seen that Dawson left spaces amounting to 14 feet and 9 feet. Now he could not have left those spaces unpacked without the bricklayer's knowing of it, and without someone else knowing also, because it would have taken half a day to build the drums, and at least half a day to pack them. Looking at this evidence therefore, Dawson could not possibly have left these drums unpacked unless they were done one or two at a time, without its coming to the knowledge of others. I come now to page 155 of Reid's evidence in relation to this same point :—

5776. If a bricklayer is going along with the work, the man who is doing the packing would be in close association with him, would he not? Yes; but you can't be laying bricks while another man is packing.

5777. But the bricklayer must observe the man who is packing, must he not;—he must do so from the narrow space in the tunnel? Yes.

5778. He could not possibly make a mistake, could he, without being observed—the man who was packing? No; if any spaces were left open, of course the other man could see them.

5779. Then Connors could not make a mistake in saying that Dawson had done bad work? There can be no doubt about it at all. There are cases, of course, where a bricklayer would build more than two drums at a time in the case of big work.

5780. *His Honor.*] How many drums back could a man pack? Three drums, comfortably.

5781. What length is a drum? Two feet 6 inches.

It will be seen from that evidence that it would be impossible for this man Dawson to have left from 9 to 14 feet unpacked on three separate occasions—on one occasion 9 feet, one of the cavities which has been discovered; on another occasion, 14 feet; on the third occasion—as discovered by Mr. McCredie upon his second visit to the sewer—about 8 feet; to say nothing of the other smaller holes. This defective work could not have been done without other men upon the works knowing of it. As I have pointed out before, and as Mr. Davis admits in one portion of his evidence, this sort of work is very common upon these contracts. A letter was read to your Honor showing that Mr. Davis had to remonstrate about a space of 9 feet which was left in the Waverley contract. I will now refer your Honor to Dawson's evidence upon page 590, where he says, in reference to Contract 79A :—

589. Were any of the contractors ever there? No; the contractors never came near us.

590. The manager treated it as a joke that you should use so little metal for the concrete? Yes; he often chaffed us about it, saying how well we were getting along with it. Then the quantity of cement was always given to the Government inspector according to the quantity of sand we used. The quantity of cement given to the inspector was always larger than we actually used.

I come now to Contract 79. He says :—

40. Was the defective work in this contract similar to that in Contract 79A? It was not similar. It was scamping in the cement. The cavities were filled in in the case of Contract 79. It was only the cement which was scamped.

41. *His Honor.*] Do you mean the cement in the brickwork or in the concrete? I mean the cement supposed to be used in the concrete.

42. *Mr. Parkes.*] Will you describe to His Honor how you workmen deceived the inspectors in order to get this scamped cement in? We had to get them out of the way. Some reason was given to get them away. There are several ways of reducing the quantity of cement. You can knock the gauge into the sand, and put the cement in.

What does the witness Darcus say?

2146. You noticed the quality of the concrete which was used upon that contract, did you not? Yes, many times.

2147. Will you say how it was mixed? At times it was mixed very carelessly. The correct quantities were not put in. The correct quantities would be 16 of blue metal, 8 of sand, and 4 of cement, but those quantities were not mixed. The mixing was done very carelessly.

2148. Did you at one time apply that better material must be put in? Yes; I had some very difficult work to do. I had to construct some arches which had to carry a very great weight, and I was afraid they might give way.

2149. Was the material bad? I did not consider that it was good enough, and I applied for better.

2150. Did they send it to you? They laughed at me.

What does Chiene say? As to that witness I should like to comment upon what has been said in regard to him. Naturally the defence—if I may call it so—has brought forward evidence with the object of destroying the character of these witnesses who have been brought forward on the charge of defective work. Among other evidence of that kind we have had evidence with the object of destroying Chiene's character. A witness named Eaton came before this Commission. At times very humorous things have occurred, even in connection with the proceedings of this Commission, and this particular incident seems to me to be the most humorous of all; for I may say indirectly I received from this very gentleman the information of the £8 per cwt. being put in the schedule of the Long Cove contract, and I also received, indirectly, from him the advice to call Chiene as a witness. Let me refer your Honor to Chiene's evidence—

4802. *His Honor.*] What was the practice as to the cement; was it gauged as a regular thing;—would a certain number of casks of cement be used as representing a certain bulk? The cask is generally put in holus-bolus.

4803. But is it the practice to gauge the cement in the gauge-box, or to treat so many casks of cement as representing (say) a cubic yard? In concrete a cask of cement is used as representing 4 cubic feet.

4804. So that the practice would not be to put the cement out of the cask into the gauge-box? Not in the case of concrete, but that is done for rendering.

4805. Is there not a method of gauging the sand, metal, and cement, in the mass for sewer packing? A gauge-box is made for the blue or white metal and a gauge-box for the sand, and the cask of cement would represent 4 cubic feet.

4806. I understood you to say just now that the blue or white metal would be heaped up, and that the sand also would be heaped up in the gauge-box, and that then the cask of cement would be put in? Yes.

4807. I want to know what you mean by that? The box is supposed to contain 16 feet of blue metal. The metal is measured in it in the way I describe, and is put on to the board. The sand is then measured and put on, and finally the cask of cement is added.

4808. You mean that one cask of cement would be the proper amount if the other materials were not heaped up in the gauge-box? Yes.

4809. What you complain of is the heaping up of the metal in the gauge-box? Yes.

Take also the evidence of Melville:—

8840. What used he to do? Well, I ordered up some stuff which he had once sent down at Thomas-street.

8841. *His Honor.*] Why? Because there were not the proper quantities in the stuff.

8842. In what way? The quantities should be 2 to 1 for the compo. used for the brickwork.

8843. What did he make it? I found it 3 and 4 to 1.

Further on Melville said:—

8855. But were you threatened with removal by anyone belonging to Carter, Gummow, & Co.? No.

8856. You said you were inspecting on a work which Mr. Gummow did? Yes.

8857. How did his men behave? A report went into the office that concrete was put in one morning mixed with pure sludge from the bottom of a shaft. That was reported to Mr. Wade. Mr. Davis was conversant with the facts.

8858. Did you take any of this stuff from the position in which it had been fixed? I found it at the top of the shaft when I went there early one morning. I had charge of the concrete and another man had charge of the brickwork.

8859. Besides Jack Reid, there was a man working on that contract named Bandeen? Yes; he was a man who was not to be trusted. I was always coming into conflict with these men, and Mr. Davis heard of my doing so on various occasions. It was over concrete and various other things.

And

And again he says:—

8912. *Mr. Gummow.*] Is it not a fact that you are a natural grumbler? I am much obliged to you for the compliment. There is one thing I should like to mention. Through the kind influence of yourself, I presume, I have been shifted out of Government employ. I was a nuisance to you because I would not allow your men to do bad work.

8913. *His Honor.*] Then you say that you are not a natural grumbler? No man who has charge of these contracts can always control his temper. I was thirteen years in the employ of the department. And under Mr. Bennett I lost one of my hands. Finally I got dismissed as I have told you. Mr. Gummow knows very well that at the time of the job in Hyde Park he would not speak to me for three weeks because I would not allow him to do what he liked. It was a question of his tearing the ground to pieces. I would not sanction the measurements without their going to Mr. Wade. I was sent from Abercrombie-street to stop Mr. Gummow from tearing the ground to pieces.

8914. When you say that Mr. Gummow persisted in keeping Shellback on the work, what did you mean? I was referring to what occurred under him. The inspecting work was divided between Gledhill and myself. I was supposed to look after the concrete; but I could not see all the stuff that went in, because the inspector is not supposed to go on to the works until 9 o'clock in the morning, and the men start at 7 o'clock.

8915. There is plenty of time for them to do bad work before the inspector is there? If they choose.

8916. Did Gledhill report Shellback, do you know? I reported him to Mr. Wade. I know nothing of what took place between Mr. Wade and Gledhill; I know that I went there one morning at twenty minutes to 8 o'clock and saw this bad stuff going down the shaft. I did not think it ought to be allowed in justice to the work itself, and I reported it to Mr. Wade, who had some of the stuff taken into the office.

8917. Then did Gledhill try to get Shellback taken off the work? I cannot say. The matter was taken clean out of my hands.

8918. All you know is that Shellback remained? Yes.

8919. You do not know how that came about? No.

I come now to Caughey's evidence:—

14019. Was that good or bad? Part of it. Some gauges went down properly, and some did not.

14020. What would you call a bad gauge? Say about a dozen shovels overfull.

14021. Was all the work done by shovelling? Where it was badly mixed.

14022. Did you see any of the sandstone and the sand for the concrete sifted? No.

14023. Was it screened? I never saw any of it screened.

14024. Was there a screen on the job? Not where I was.

Further on he says:—

14055. Was Reid a man who insisted upon your doing good work or asked you to do bad work? No. After the mixing of the concrete, we had a man who was supposed to be over us, and we had to go by his instructions.

14056. Who was that man? He is not alive now. It was George Humphreys. He was the man I worked under principally then.

14057. Would he instruct the men to do good work or bad? He would start doing inferior work, and we would have to do the same.

14058. How many sumps did you work on? Only No. 11 and No. 12.

14059. At which one were the stones put down? No. 11.

It will be clearly seen that Caughey was not a willing witness. While he could not deny that very bad work was being done on the Glebe job, at least, he did not wish to make it appear as bad as it really and truly was. What did the witness Green say? He gave evidence to the effect that he was out at Shea's Creek, and that he casually saw the men mixing up concrete for Contract 72. He says:—

13817. In the case of Contract No. 72—the Shea's Creek job, do you know how they mixed the concrete? I was not working there; but not being at work at the time I was often over there, and I saw a lot of dirt and stuff being shovelled up with the stone which went in with the concrete.

13818. Have you a good knowledge as to how concrete ought to be mixed? Yes. I take it that my experience of twenty or thirty years ought to tell me how concrete should be mixed.

13819. How was the concrete mixed, in your opinion, on the Shea's Creek job? I have no fault to find with the mixing. What I find fault with is the kind of stuff which was put into the

the concrete. You know that when sandstone is broken a lot of it goes very small, almost like sand. The stuff was shovelled up from the ground where it had been broken, and with it was a lot of sand and dirt.

13820. What effect would that have upon the cement? Well, there would be more sand in the work than there ought to be to begin with, to say nothing of the dirt and the sand, I should say, would take the strength out of the cement in any case.

There is no doubt that that is the way in which the cement, which is a very valuable component, as far as money is concerned, became eliminated from the work. If your Honor will look at Inspector Fowle's evidence, you will see that he freely admits that he had to keep a constantly watchful eye upon the man Reid and other men who were employed by Carter, Gummow, & Co., in order to ensure the proper carrying out of the work as far as concrete and work of that description, in which cement would be used, was concerned. There is only one way, I submit, in which concrete can be properly tested. There is only one way in which you can find out whether the concrete is composed of the specified quantity; and that would be to have these works thoroughly searched, and to have specimens taken from them for analysis, by disinterested and qualified experts. That analysis would prove conclusively whether there has been a saving effected in the cement or not. Failing that, however, the evidence, I submit, which has been placed before your Honor is of such a conclusive nature that it is impossible to see how anyone can say that there has not been, as I alleged in my charges against the department, imperfect supervision and very great loss to the State from the payment by the department for concrete of the most superior kind, when, as a matter of fact, concrete of a very inferior order has been supplied. There has not been sufficient supervision over the whole of these works—in fact, there does not seem to have been that supervision which would be necessary to insure that the proper quantity of cement would be put in. It may not be considered proper to charge Carter, Gummow, & Co. with doing this work knowingly. That I cannot tell. It may be that their workmen did it to please them, or for other reasons best known to themselves; but, as a matter of fact, there the saving is, and certainly there ought to have been a better check kept by the department, because the whole of the blame must rest upon them if a great saving of cement is shown to have been effected by the contractors, thus putting money into their pockets at the expense of the State. The papers I have enumerated, and which are printed in the Appendices, will show, as I pointed out, the time when cement was delivered upon Contract 79 by Parbury, Henty, & Co. The papers will also show the time when the first certificates were given upon the delivered cement—that is, as to its being tested. The papers will also show the time at which the first advance was made upon that cement. Then the inspectors' returns show, date by date, from the commencement of the use of the cement until the completion of the contract, how it was used. Your Honor has before you absolute evidence as to the quantity of cement which was delivered on Contract 79, and as to the quantity of cement used in the work. Then we have entirely independent evidence showing that it would not be possible to bring from Contract 72 to Contract 79, under the circumstances, any cement. The facts to which I have directed attention entirely destroy the supposition on the part of the department, and the contention, on the part of Carter, Gummow, & Co., that a large quantity of cement was transferred from Contract 79 to Contract 72. I would point out that Mr. Boys was employed upon Contract 72—in fact, he came from Contract 72 to Contract 79, and Inspector Fowle acted as chief inspector. But Mr. Boys, having come from Contract 72, would naturally have entered in his journal the receipt of the 2,000 casks if it had been actually transferred from 72 to 79. But nothing of that sort appears in his book. He wrote a minute in reference to 130 casks out of the 999 delivered as having been sent to Contract 90; and in respect of Contract 79, Inspector Fowle's evidence shows that no cement work was started upon the job until May, 1893. There was an interval between the stoppage of Contract 72, which would be in October, 1891, until the first cement was used upon Contract 79, in May, 1893, of about eighteen months, during which the cement would have had to be stored upon the contract had it been taken over at all. Moreover, the transfer would have had to be mentioned in official documents. I come now to a little phase of this inquiry which has received considerable attention, and that is the connection of certain officers of the department with this firm of contractors. I would first of all draw your Honor's attention to Mr. Davis' memorandum which appears upon page 633 of the printed evidence. That is one of many indications which I have adduced before the Commission of the totally unreliable nature of the information supplied to your Honor by the department. Mr. Davis says that Mr. Resident Engineer Weedon, from whom Carter, Gummow, & Co.—I use the name of the firm, because the firm paid the interest—borrowed £2,000, was put in charge of Contract 79A only from March, 1895, to April, 1895. I would ask your Honor to refer to the Parliamentary Return—to look throughout the papers, and to take cognisance of the oft-repeated evidence which appears in them from letters written to Mr. Weedon, from minutes written by him, and also from letters written by and to him, the documents passing backwards and forwards—when you will see that from the start of Contract 79A until a change was made in the branch, and its work was handed over to the Water and Sewerage Board in April, 1895—during the most important part  
of

of the carrying on of that contract—Mr. Weedon was there in charge. If you will refer to page 361 of the Parliamentary Return you will see that on 9th September, 1894, there was a letter from Mr. Davis to Mr. Weedon, and that on the 16th October, 1894, there was a letter of Mr. Weedon's to Mr. Davis. On 27th November, 1894, there was also a letter from Mr. Weedon. On 28th November, 1894, there is a minute concerning Mr. Weedon. On the 16th January, 1895, there is further evidence of correspondence in which Mr. Weedon was concerned. This occurs again on the 7th January, 1895, on the 9th January, 1895, until finally on the 8th March, 1895, Mr. Weedon settled the prices for an addition to Contract 79A—that is, for the High-street branch. Your Honor will have observed the high values which were put upon that contract, and, in this connection, I would ask your Honor to peruse Mr. Weedon's memo. to Supervising-Engineer Davis on the 8th March, 1895:—

|   |       | 8 March, 1895.                                       |      |    |       |    |             |
|---|-------|--|------|----|-------|----|-------------|
|   |       | £  | s.   | d. | £     | s. | d.          |
| ESTIMATE North Shore Sewerage Extension, High-street branch:— |       |  |      |    |       |    |             |
| 767 lineal feet   | ..... | Rock tunnelling complete—4-in. powder; size of sewer |      |    |       |    |             |
|   |       | 3 ft. 3 in. x 2 ft. 2 in. ....                       | 36/- |    | 1,380 | 12 | 0           |
| 100   | „     | .....  |      |    |       |    |             |
|   |       | Rock tunnelling complete—4-in. powder; 9-in. dia.    |      |    |       |    |             |
|   |       | pipes .....  | 27/- |    | 135   | 6  | 0           |
| 90 cubic yards  | ..... | Shaft excavation .....                               | 30/- |    | 135   | 0  | 0           |
| 60 square yards   | ..... | Cement facing .....                                  | 2/6  |    | 7     | 10 | 0           |
| 13½ cubic yards   | ..... | Sandstone concrete .....                             | 30/- |    | 20    | 0  | 0           |
| 33  | „     | .....  |      |    |       |    |             |
|   |       | Bluestone concrete .....                             | 60/- |    | 99    | 0  | 0           |
| 45  | „     | .....  |      |    |       |    |             |
|   |       | Filling .....  | 1/3  |    | 2     | 16 | 3           |
| 360   | „     | .....  |      |    |       |    |             |
|   |       | Surplus material .....                               | 1/-  |    | 18    | 0  | 0           |
| 2 No.   | ..... | Manhole covers (£6).....                             | 3/-  |    | 0     | 18 | 0           |
| 1·2 square yards  | ..... | Bluestone setts .....                                | 30/- |    | 1     | 16 | 0           |
| Estimated cost of 3 ft. 3 in. x 2 ft. 2 in. sewer complete,   |       |  |      |    |       |    |             |
| between 1 m. 38·023 and 1 m. 51·1923 .....                    |       |  |      |    |       |    |             |
|   |       |  |      |    |       |    | 1,800 12 3  |
|   |       |  |      |    |       |    | £1,800 12 3 |

Tracing herewith.

STEPHEN H. WEEDON,  
Resident Engineer.

It will be seen that the bluestone concrete is put down at 60s. and the sandstone concrete at 30s. That branch was not let with Contract 79A. It is a branch for the drainage of houses, and there is no doubt that these are most excessive prices, having regard to the circumstance that the work was of a much cheaper nature than was that in the original contract. It will be observed that Mr. Weedon had complete control of all the earlier portion of this contract. In addition to that, it can be seen from a glance at the Parliamentary papers that there is a greater connection of Mr. Weedon with Contracts 69 and 79 than is set forth by Mr. Davis' memorandum on page 633 of the printed evidence. I do not know how it is that Mr. Davis came to state that Mr. Weedon was on Contract 79A only from March to April, a period of one month, when he was there for a period of more like twelve months. This shakes my faith in the evidence which Mr. Davis has put before the Commission in this tabulated form. I do not wish to argue from this circumstance that there should be any terrible punishment inflicted upon Mr. Weedon for having had this connection with the firm of contractors, for having put money into the contractors' business and works. What I say is simply this—that such practices are not of the very best nature—that is using the mildest expression—and that they ought not to be allowed in connection with Government contracts which these officers have to supervise. It will be remembered that in the case of the Bare Island contract two officers were so severely dealt with as to be dismissed peremptorily, for borrowing money of the contractors. To my mind they were too severely dealt with under all the circumstances. My object, however, is merely to put a stop to any future relations of this description, or any such defective working of the department as your Honor may discover during the course of your inquiry. I do not think this connection of Mr. Weedon's with the contractors should be tolerated, or that it should be accepted as a precedent for other officers of the department to follow. At the same time, I should be very sorry to see him put into a position of trouble or even lose any of his salary in consequence of this transaction. No matter what explanation may be forthcoming, we cannot afford to look upon these matters from a sentimental standpoint. Mr. Weedon's position is one in which he derived a direct benefit from the firm of Carter, Gummow, & Co. It does not matter whether he lent the money privately to Mr. Carter, or whether it was lent by him to the firm. Mr. Christie points out that, from the bank pass-books of the firm of Carter, Gummow, & Co., the quarterly interest was paid by the firm upon this advance of £2,000. It is no explanation to say that Mr. Carter borrowed the money privately from Mr. Weedon, and lent it to his firm. That will not avail, because the benefit derived by Mr. Weedon was direct from the firm. I submit that there was no intention that it should be regarded as a private transaction between Mr. Weedon and Mr. Carter. Mr. Christie, in his evidence, sets forth the state of the firm's business at the time of the transaction. I will refer your Honor to page 232 of the printed evidence, Question 8325. From the facts there disclosed, it is apparent that there was a necessity for the firm, who had an overdraft at that time, to receive a certain amount of money and to pay it into their banking account. In support of that contention, let me direct your Honor's attention to the evidence of Mr. Parfit, the Manager of the Bank of New Zealand. He explained to us that the limit put by the bank on the credit of Carter, Gummow, & Co. was about £3,000. He said that if their overdraft went above that amount he should require an explanation.

explanation. It is clear, therefore, that the money which was borrowed from Mr. Weedon was useful to Carter, Gummow, & Co. at that particular time, as, in addition to their overdraft, they had several other heavy items of expenditure to meet, and Mr. Weedon must have looked to some advantage in having his money with Carter, Gummow, & Co.'s business. Your Honor had before you Mr. Greig of the firm of Richardson & Wrench, a valuer under the Real Property Act. Mr. Greig is a well-known valuer in this country, and his valuations are accepted both here and abroad as above those of any other valuer in the colony. This gentleman valued the various properties of the firm. It was shown that the property upon which Mr. Weedon had advanced this sum of money, and which he held as security, was worth only £1,600 at the present day. It was also shown in Mr. Christie's evidence that although this property was held as security for the £2,000, there was only a certain proportion of it which was really in the name of Mr. Carter, Messrs. Carter, Gummow, & Co., being set down as owners to the extent of £887 10s. Really the property belonged to the firm of Carter, Gummow, & Co., so there can be no doubt about it that Mr. Weedon's interest was wrapped up in the profit, progress, and general prosperity of that firm. Otherwise the security was useless, and his income from it would be anything but assured. It must also be remembered that Mr. Weedon was the supervising engineer upon Contract 72 before coming to Contract 79, so that he had considerable experience with these contractors. I come now to Mr. Rudolph's matter. He is in much the same position, the difference in the two cases being that he borrowed without interest from Carter, Gummow, & Co. Mr. Rudolph was the engineer who supervised the Glebe contract, concerning which there have been so many doubtful rumours, and concerning which, also, some very definite evidence has been brought before this Commission as to its being a contract upon which a certain amount of defective work was done. Mr. Rudolph, no doubt, borrowed this money with the best of intentions, but nevertheless his action in borrowing the money—and I admit willingly that it may be that Mr. Carter lent it with the kindest of intentions—is not one of the very best, is not one which it is advisable to allow in connection with Government work, where so much depends upon these officers, and particularly when you consider the class of men who have to be dealt with. Your Honor must know, after hearing evidence from the heads of the department down to the workmen upon the contracts, that it is looked upon as a fair thing to cheat the Government in any way possible in sewerage construction. Even Mr. Davis and Inspector Fowle have said that these sewerage contractors required constantly watching. According to these gentlemen, the best of these contractors, Carter, Gummow, or any of them, require very careful watching. Then we have the comment of Mr. Carter himself—and Mr. Gummow made a remark to the same effect—that it is only human nature, and a perfectly legitimate thing from their point of view, for contractors to take advantage of an inspector whenever he gives them the chance. In answer to a question asked by your Honor, Mr. Carter admitted that it was but human nature, and he said that contractors—Mr. Forrest, Mr. Snodgrass, his partners, or others—would certainly take advantage of an ignorant inspector; an inspector who was not alive to his duties. This conclusively shows, to my mind, how very necessary it is that there should be no connection whatever between any of the inspectors of the department and the contractors in any monetary transactions, no matter how innocent they may be. I turn now to Mr. O'Hanlon's matter. He had a transaction with Mr. Carter of a similar nature to that of Mr. Rudolph. I would impress upon your Honor that these transactions have been found just at haphazard from a perusal from the bank passbooks of Carter, Gummow, & Co. They would not have been found had a careful search not been instituted through those books. They are transactions which were casually hit upon, and it is possible—seeing that no books were provided by Messrs. Carter, Gummow, & Co. which would in any way show their business transactions, notwithstanding that they had these enormously complex dealings—such, for instance, as Mr. Carter borrowing money from Mr. Weedon and lending it to the firm, and taking money out of the firm and lending it to inspectors, or taking money from the firm for charitable purposes, and giving it here, there, and everywhere—it is quite possible, I say, that, if transactions such as these have been discovered in this particular way, there may be others. Moreover, if transactions of the kind which I have just instanced can be made with the firm's account, how could there, in the absence of books, be any satisfactory adjustment of the partnership? These transactions, as your Honor is aware, have been casually hit upon without any assistance so far as any books from the firm are concerned. They never would have been discovered, perhaps, but for a very close research, and, even as matters stand, we cannot tell what may have taken place in the past in the way of transactions between officers of the department and contractors as regards the lending and borrowing of money or the interchange of money by way of friendly transactions. In addition to these matters, there are smaller matters which, I think, are admitted by Carter, Gummow, & Co. I refer to the giving of amounts at different times by way of subscription to sick lists, submitted to the firm by inspectors, and in which the inspectors and others were concerned, the inspectors being invariably treated with the greatest possible consideration. The one exception appears to be Inspector Reid, with whose relations to these contractors I will deal separately later on. While addressing myself to this question of defective work, I would point out how conclusive has been the evidence throughout that



that, while the department knew of very inferior work going on upon these various contracts, they still allowed to be retained upon the jobs men who had been discovered doing that very defective work. Mr. Davis, when giving his evidence, read letters showing the reasons for the dismissal of certain inspectors, and then proceeded to show that they were immediately reinstated and were sent on to other contracts and kept going in that way. Take the case of Hamilton. He was an inspector, who allowed some very defective work to be done, evidently from carelessness. The department would not have treated him in so harsh a manner, as far as writing is concerned, as disclosed by the letters put in as evidence, had it not been for his allowing such gross carelessness on the part of the contractors, whereby there was such a large saving to their pockets, to the loss of the State. This man was simply changed from the position of inspector on the Waverley contract to the position of inspector on the Glebe contract, at a reduced salary it is true, but still he was engaged on the work of Carter, Gummow, & Co. He has remained in the department ever since, being simply transferred from one of Carter, Gummow, & Co.'s works to another work of the firm. There is evidence that other inspectors have been summarily dealt with for offences of considerably less magnitude than any committed by Hamilton. Again, take the case of Gledhill. Inspector Melville in his evidence clearly pointed out that Gledhill was responsible for the bad concrete which went down behind the Hyde Park sewer—Gledhill as well as the man Shellback. These men were both kept on the work, and they are at the present moment on them, Gledhill being still an inspector. As regards the Waverley contract, it will be remembered that Mr. Davis wrote very strong condemnatory letters concerning an inspector named Vincent. This man has been kept upon Carter, Gummow, & Co.'s works, and has been taken from one district to another, where their works were going on. The evidence is that he has been kept continuously going by the department. He was actually supervising Contract 79A, where the very defective work described by Dawson had taken place. Then the bricklayer, Reidelberg, has also been continuously employed by Carter, Gummow, & Co. upon all their works. This man was condemned by Mr. Davis as having carried out very defective packing upon the Waverley contract. Then there is Hansen, who was also caught at North Shore doing defective packing, and who was simply transferred from Contract 79 to Contract 69, from one work of Carter, Gummow, & Co. to another work of the same firm. Then we have Manager Reid, who has been constantly reported upon every work which Carter & Co. and Carter, Gummow, & Co. have had for some years. He has been constantly reported as a man who would do the greatest possible amount of defective work upon every occasion, endeavouring especially to save cement for his employers. Take Inspector Melville's evidence concerning him. He tells that he caught him close upon a dozen times trying to cheat by saving cement in concrete. The man appears to have been a constant nuisance to the inspectors. Mr. Davis himself says he was not a man of whom he could at all approve. We also have Inspectors Wagg and Reid complaining of the same man. Witness after witness proved, I think, to your Honor's satisfaction, that Reid was a man who laid himself out, in the interests of the contractors, to save cement wherever he could. He was a man also who is said to have quarrelled with both inspectors and men, and we are told that he tried in every possible way to effect a saving to the contractors to the detriment of good work. Yet he was kept constantly upon the jobs of this firm. He left only two or three months before this Commission commenced, and he left the firm then only because they had not work with which to keep him going. There are other men who have been conclusively proved to have been not at all suitable men to be kept upon these contracts. Yet these men had been retained. The treatment of Inspector Reid by these men, when he was starting to keep them in check, is quite consistent with their general conduct. I say that sufficient care has not been exercised, that sufficient supervision has not been maintained in the carrying out of these works, and the conduct and action of the department itself has, whether intentionally or otherwise, been directed to the interests of Carter, Gummow, & Co., instead of to the interests of the State, in the carrying out of the various contracts upon which I have touched, whether casually or in exhaustive detail. I come now to the remark made by Mr. Carter—and it has not yet been challenged, it has not been contradicted—to Inspector Reid. What does Reid say in his evidence?

233. Did you ever receive any intimidation at all from any of the contractors? I saw Mr. Carter in the cable tram at the North Shore after one of these reports, and he told me I was making a fool of myself. He said, "As to these reports of yours you know you cannot hurt us. We are too strong."

That has not been contradicted, and it shows that Mr. Carter was regarded with such kindly feelings, to say the least of it, by the departmental officers that he could afford to defy the inspectors if they were in any way obstructive to him, in the carrying out of his works in such a way that they would not be as perfect as his contract with the Crown would require them to be made. I will also refer your Honor to question 358 in the evidence of Mr. Hickson:—

358. Did Mr. Carter request the removal of your own officer? I am not sure that he actually put it in that way. I think he said that as long as Reid was there there would be friction. He expressed a desire for the withdrawal of Reid—at least, I so understood him.

I should think that if anything would make the mind of an engineer supervising works of this sort suspicious as to the nature of the work that was going on it would be a request from the contractors themselves to have a certain inspector removed from their works. But Mr. Hickson acted upon Mr. Carter's request and removed Inspector Reid. I say emphatically that that must convince everyone that Contract 79A is a contract which has been carried out with an excessive amount of defective work in addition to that which has been pointed out by the witness Dawson—that it has been carried out in a manner in which it could not be carried out had there been an inspector such as Reid upon the job. An inspector will at times complain of little things as well as of great things, and if he allows defective work in small details he will be tolerant of defective work upon a larger scale on the important parts of the work. Everyone who has had to do with the supervision of the construction of works knows how constantly you have to watch the men who are engaged upon the work—how carefully you have to check them in every respect. It is a well-known fact that those engaged in supervision of that kind find it necessary to make constant application to the men to do that which is proper; and that Reid was justified—was fully justified—in keeping the strict control of the work which he did keep—the strict and thorough supervision which he did keep—is fully borne out by the evidence which we have had upon the subject of defective work. Before leaving that question I will direct your Honor's attention to Inspector Melville's evidence concerning Shellback. Some of the statements he made will be found given in reply to question 8897. Inspector Melville pointed out that, in spite of his complaint, Shellback was still continued on the work. I will now deal more particularly with Inspector Reid's case. Your Honor had him before the Commission as a witness, and I have no doubt you came to the conclusion that he was a man of sterling honesty. He is undoubtedly a man who would do his duty even though it entailed disaster to himself. He came to be somewhat fearful of the treatment he received on these works. He was invited by Mr. Snodgrass on one occasion to have a drink and to be sociable; but, knowing the clear line of demarcation which must be drawn between the adequate discharge of his duty in his position of inspector and his fraternal relations with the workmen and contractors, I think he took the proper course in declining to enter into the suggested association with them. The position of an Inspector while engaged in the carrying out of Government works is clearly defined. He must do his duty quietly and persistently, and without having any association with the men by means of which an advantage might be gained over the Department by the contractors. This line of conduct seems to have been the one followed by Reid very carefully throughout, and what has he received for it? He was removed from the job, and ultimately his relations with the Department were altogether severed. Evidence of contractors over whom Reid has acted as an Inspector has been brought before the Commission—for instance, we had Gilliver, Rhodes, and other persons, who have given him the character of being a man who took particular care that not the slightest defective work should go into any job he was supervising—that he was most particular in the carrying out his duties, and that he was not the meddling man that some persons have endeavoured to make him out to be. He exacted the carrying out of the specification to the fullest extent possible, and who can deny that that was the duty he had to perform? He had occasion to make reports constantly with reference to the work of Carter, Gummow, & Co. He told us that he sent in at least three or four reports, and that no attention was paid to them, until he at last came into conflict with the men who persisted in doing bad work. After that he wrote through his superiors to the Engineer-in-Chief, and it is admitted that that report, as well as the other reports which he had forwarded, was received from him. Nothing, however, was done to back up this man in his efforts to get the work properly carried out. He was ultimately removed from the work and was sent on to other contracts. Now I submit that if his services had been continued where he was it would have been to the interest of the State, and it would have prevented work from going on in the manner in which it did on Contract 79A. We cannot at the present time tell the extent of scamped work which may have gone on in connection with these sewers. We have had irrefutable evidence that it is absolutely impossible to tell from the tapping of the brickwork whether drums have been properly packed or not. Inspector Fowle was very emphatic upon that point. He said you could not tell from tapping whether the work was good or not, and Manager Reid, on being questioned by Mr. Davis, gave evidence to the same effect. He is a man of experience, and would be likely to know. There can be no doubt, in my mind, that Mr. M'Creddie in going through these sewers passed many cavities. Mr. Davis said, in answer to your Honor, that in one case where Dawson hammered he thought the ground in that drum was absolutely solid. I will give you the words which Mr. Davis used. You will find them in reply to question 14638:—

14638. In relation to the necessity for watertight packing, I understood Mr. Bagge to say that one principal reason why it was necessary to have watertight packing was because of the great uncertainty of having the joints of the brickwork regularly filled;—as to that reason, can you say whether he is right or whether he is mistaken? I think the joints on the whole would be filled. I have examined a good deal of the work after it has been finished, and I find that in the majority of cases the joints have been fairly filled. I take that which we examined six weeks ago  
at

at North Shore. Although the bricks were very much radiated—I suppose there was as much as three-fourths of an inch on the wedge of the brick—it was probably three minutes before the man, using a 5-lb. hammer, could drive out one of those bricks. There was nothing behind the brick—indeed, I said to Dawson, “That is solid;” but it was hollow all the same. It was simply that the brick had been properly bedded, and the adhesion of the brick to the mortar prevented it from coming back.

It will be clearly seen that an inspection of these works, made by simply tapping, would be by no means conclusive as to the extent of defective work of that nature which may have been carried on.

*His Honor* : On reflection, I have come to the conclusion that the evidence in this inquiry will hardly be complete without the evidence of Mr. Snodgrass, if his attendance could be secured. I wished to avoid the expense of bringing him here from New Zealand; but I think that, if possible, he really ought to come.

*Mr. Carter* : I know nothing of Mr. Snodgrass’s movements, your Honor, except that he is at the Thames, in New Zealand.

*His Honor* : I understand that he is in no way connected with your firm now?

*Mr. Carter* : No.

*His Honor* : Does he correspond with you?

*Mr. Carter* : Not regularly; I heard about a month ago that he was at the Thames. I understood that he was then about to engage in the manufacture of explosives.

*His Honor* : I suppose he could be found easily enough at the Thames?

*Mr. Carter* : I think so, your Honor. It will be merely a question of travelling expenses.

*His Honor* : I suppose that as far as you know Mr. Snodgrass could leave the factory for a time if it has been actually started without any great risk?

*Mr. Carter* : I should think so, your Honor.

*His Honor* : Then I will have a cablegram despatched to him in the course of the day requesting his attendance.

His Honor at 1:10 p.m. adjourned the inquiry until 10 a.m. on Wednesday, October 7th.

C. E. R. MURRAY,

Commissioner.

WEDNESDAY, 7 OCTOBER, 1896.

His Honor sat at the Board Room, Chief Secretary’s Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising), Mr. Ernest Smith (appearing for Mr. Hickson), Mr. Carter, and Mr. Gummow of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, also attended.

*Mr. Davis* : Before Mr. Parkes resumes his address I should like to explain a little matter which occurred yesterday with reference to some evidence which has been given. Mr. Parkes referred to a list of officers employed upon Contract 79A, which was given by me and which appears on page 633 of the printed evidence. A mistake has been made. The list which appears in the evidence is from a rough slip handed to my clerk from which to make it out. I had made a note of interrogation opposite the date of March, 1895, in the case of Mr. Weedon. The clerk copied it without making any inquiry; and a mistake has been made.

*His Honor* : Have you discovered what the date ought to be.

*Mr. Davis* : I find there is a difficulty in getting the precise date from the records. Mr. Boys had a note in his pocket-book; and he wired to me last night that the date would be June 18th, 1894. That would be the date of Mr. Weedon’s taking charge of Contract 79A.

*His Honor* : I will now call upon you, Mr. Parkes, to resume your address.

*Mr. Parkes* : When your Honor adjourned the inquiry yesterday I was dealing with the evidence which had been tendered upon the question of defective work, and I will now read a quotation from that evidence, which will show to some extent how it comes about that some of the defective work has been done. For instance, we have had evidence as to the racing in the work which is encouraged by Carter & Co. in the carrying out of their contract. I will refer your Honor to Question 5389:—

5389. Do you remember making a wager of half-a-sov., at North Shore, five or six years ago, in connection with some pipes which were being laid? Yes; I remember it, not from the making of it, but from the occasion.

5390. You paid the man;—he beat you, did he not? Yes; I paid him.

5391. Were the pipes decently laid? I believe so.

If your Honor will now refer to Question 6695 in Owen's evidence you will see that £50 appears to have been given to the men who could put down a shaft in the quickest time. Then there is further evidence upon this point given by Inspector Fowle. He says:—

16460. And you sometimes caught the men doing bad work? Yes.

16461. How did they excuse themselves;—did they say that the work was being done by order, or did you find that it was being done by order? No; it was due to carelessness, as a rule, on the part of the men. On some occasions, in the bricklaying, the men would race one another to see who could get through the quickest, in order to curry favour with the contractors. Of course the man who got through first with his length would be thought more of by the contractors. He might be thought to be a better man from their point of view than the others.

16462. *Mr. Parkes.*] Were there any prizes attached to this racing? I have never known of any in that work.

16463. *His Honor.*] That sort of thing would be approved by Reid, as far as you could see? Yes.

I point this out to show that there really was an inducement offered to the men to do bad work—I mean the class of bad work which would result from quick work. As a matter of fact, the men themselves could not be said to gain greatly by it, if they gained at all. The clear gainers in a case of that kind are the contractors themselves, because by hurrying the work the workmen diminish the time of their employment. It is absolutely necessary, therefore, that, both on the part of the department, and also on the part of the contractors, the most scrupulous care should be taken in the carrying out of the work. No inducement should be held out to the men to do their work in such a hurried manner that it would be likely to contain more or less bad or defective work. I will also refer to the general testimony given as to the character of Inspector Reid. Mr. Hickson and Mr. Davis have both given him letters of testimonial. These letters have been put in evidence. All the contractors with whom Reid has worked have given him the highest character possible. There can be no doubt, therefore, that he is a man of very good character. I will now deal with the contracts in order—taking, first of all, Contract 77. That contract is a peculiar one, inasmuch as it involves the introduction of what is known as the Monier patent. I would impress upon your Honor that the department consists of a head engineer and of other engineers who are under that head, and that their duties are to prepare the most clever and suitable designs for any given work, and also to prepare specifications, having regard to the most economic considerations, in the interests of the State. Of course economy in construction would naturally be with them a great feature in the efficient discharge of their duties. These are the duties for which they are paid. In the carrying out of this particular contract this understanding would appear to have been departed from. In the first place the heads of the department allowed the contractors to send in on their own behalf their own plan and estimate, and to practically carry out the work at their own price without any check whatever as to whether that price was a fair one or not as regards the State. It is for your Honor to judge whether this course was taken with the idea of favouritism or not. I hold that it was, and I hold also that sufficient evidence has been brought before the Commission to show clearly that that was the case. I would, first of all, touch upon the manner in which this work was introduced. It is not as if the Monier principle were unknown in the department; it was unknown by it until some two years before this contract came up; and it has been clearly proved by the admissions of various witnesses that it was the intention of the heads of the department to take advantage of a favourable opportunity to give the patent a proper test. Their duty, in making this test, would have been to select some special place for the purpose and to have given it a trial with the object of seeing whether the system was economical as well as serviceable. Instead of doing that they undertook to pay the contractors 15 per. cent. for the use of the patent before satisfying themselves whether or not it was a good one to adopt. They called for tenders for an aqueduct, upon the most elaborate design which could possibly have been got out, both from a structural and from an architectural point of view. Tenders were called for; and the alternative design, made by an officer of the department, was submitted by Messrs. Carter, Gummow, & Co., with their tender upon the departmental design. I submit that, upon the evidence, it was known by Mr. Hickson that the design was made by that officer. It is quite clear, from witnesses who have been examined here, that no secret was made by Mr. Baltzer, the draftsman, of his intention in making the plan. It is undeniable, I contend, upon the evidence that the State would be a sufferer by the introduction of the Monier system upon this particular contract, as far as money is concerned. The second portion of the case, as regards this contract, with which I will now deal, is the method by which the sureties were obtained in order to secure this work, should there be any risk. Of course, it was admitted that there would be a certain amount of risk. The patent was a new thing in the country. It was altogether a new departure in construction, and it was seen that a certain amount of risk would accrue from the experiment in such a large and important work as the Johnstone's and White's Creek aqueducts.

In the third place, I want to point out to your Honor what I consider to be unanswerable evidence that a loss was sustained by the State through the substitution of the alternative for the original design. Mr. Hickson ought to have had sufficient experience from what happened in Adelaide, when Wells Brothers sent in their own plan and specification for the Rivoli Bay and Kingston jetties, as has been disclosed to this Commission, because in that case difficulties and complications arose which should have convinced him that it was not a wise practice to allow contractors to put in unchecked designs and estimates for their own work in competition with the departmental plans. Mr. Hickson, in spite of that experience, used every effort possible to induce the Minister to accept the contract sent in in this manner by Carter, Gummow, & Co. He also knew as conclusively as any man could know that an officer of his department was deeply interested in this patent; and he also knew—and both of these facts have been proved, I contend—that this officer had access to all the papers and particulars of the work which was prepared by the departmental officers. There is no doubt whatever about that. In spite of this knowledge, Mr. Hickson never, from his own admission, took the slightest trouble to find out from Mr. Baltzer, Mr. Carter, or from anyone else, what was the actual detailed cost or what material was to be put into the work; whether, taken as a whole, the work bore a fair comparison as regards cost with that under the departmental plan or not. Nothing of this kind was done; but when the tenders came in Mr. Hickson sent on the tender and alternative plan, or rather took them himself to the Board of Reference. That is the first step which was taken when this substituted plan was sent in, and I would point out to your Honor the evidence given by Mr. Hickson and Mr. Darley in connection with the introduction of this Monier principle. Mr. Hickson's evidence upon the point is as follows:—

1288. What did you say to the Board? When this tender came in on 14th March it was arranged that the work should be taken out of my hands and handed over to Mr. Darley. I brought the tender and the plans down to Mr. Darley, and we talked over the matter for a considerable time. The result of the conversation was that we both thought it desirable that an opportunity should be given of testing the Monier arch principle, which was acknowledged by all engineers on the Continent to be a very valuable engineering structure, and that the matter should be considered by the Board of Reference. The papers were then sent down to the Board of Reference without any direct recommendation from myself or Mr. Darley.

Your Honor will see that directly he got this alternative tender and plan he proceeded to discuss the matter with Mr. Darley. What is Mr. Darley's evidence upon this point? He says:—

2030. Had you not had a consultation with Mr. Hickson about the matter before? No; I never saw this aqueduct before the tenders were called for. Before the tenders came before the Board of Reference I did not know whether it was to be a pipe or an aqueduct.

2031. Do you know anything about the Monier arches now? Yes. My attention has been directed to the matter since.

2032. Do not you think that as there is only a difference of something over £200 between the two contracts it would have been better to have a good substantial structure, instead of taking the risk of the Monier system? I do not think there is any risk, and you are getting a much nicer-looking structure.

2033. If there be no risk, why did you, as one of the Board of Reference, suggest that on account of the risk good surety bonds should be given? It was a new thing at the time, but I do not now think that there is any risk in adopting it.

Later on in his evidence the same witness said:—

2076. Are you sure that you never discussed the Monier principle with Mr. Hickson before it came before the Tender Board? I think he had called my attention to it, but not in connection with any particular contract. I remember his showing me some French work about the Monier system. I think he was the first to call my attention to it. I think he said he would like to introduce it into some of our country bridges; but his observations had no connection with any particular contract.

You will see that Mr. Darley absolutely contradicts Mr. Hickson's evidence as to his having interviewed him before this matter came before the Board of Reference. Mr. Barling in his evidence said:—

Mr. Hickson thereupon explained that he and Mr. Darley had carefully gone into the plans and specifications, and also the cost, and that they were prepared to recommend that this particular system should be tried. Upon that explanation the Board unanimously came to the conclusion that it would be perfectly safe to try the work.

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Your Honor will see that Mr. Hickson assured the Board of Reference also that Mr. Darley had gone into the question of cost. Now Mr. Darley has sworn that he did not do anything of the sort. What did Mr. Barling say later on in his evidence?

7427. If this Monier plan, made by an officer of the department, were submitted by the contractors as a substitute for the office design, do you not think that it would be a proper thing for the officer in charge to have taken out the quantities, in order to ascertain what the real value of the lump-sum undertaking on the part of the contractors was? I was perfectly unacquainted with the fact that an officer of the department did prepare a plan for the contractors. I was very much astonished to see that evidence had been given that any officer of the department had made this plan. I did not know it, and I certainly do not think that any member of the Board of Reference knew it. As to the main question of whether the relative values should not have been tested, I imagine that that was gone into.

As a matter of fact at least one member of the Board of Reference must have known that an officer of the department was connected with the patent—that has been admitted—and that member of the Board of Reference was Mr. Hickson. The Board then recommended that this Monier system should be adopted if good sureties were found—not sureties in the ordinary way, but sureties to be taken for a special purpose—not sureties for the ordinary method of carrying out a contract, but sureties for the application of an entirely new system of construction which might turn out badly, necessitating the pulling down of the work to its very foundation, and the replacing of it with another structure. Of what description were these sureties to be? They were to be independent sureties. As it turned out, the sureties were two partners, and certainly not the most financially strong partners, but the least financially strong, in the firm of Carter, Gummow, & Co. Their names were sent in to the department, and the department accepted them, almost admitting, as they do now, that they knew them to be connected in some degree with the firm as contractors. It has been proved conclusively, I think, that they were beneficiaries in the contract from first to last—that they participated in any gain which might be obtained from the work. They were members of the firm purely and simply, and I put it to your Honor whether, if anything had happened such as the contractors' becoming insolvent or wishing to shirk their obligations, there was any further security to the Government from these sureties, being taken. Is there any security to them whatever in having two members of the firm as sureties? If anything of the kind I have indicated had happened, every member of the firm, including Mr. Forrest and Mr. Gillan, would have come in, and there would have been no further remedy given to the State as regards sureties. That certainly was not the intention of the Board of Reference when they told Mr. Hickson that they would agree to the acceptance of the alternative design if independent sureties were found. The matter afterwards went on to Mr. Young, the Secretary for Public Works, and he, reading all the papers which had been put before him, and considering the explanations which were made to him, said, "Yes, I will consent to this if the Board of Reference advises its being carried out, and if I am assured that it is not very much cheaper than the office design which has been prepared." I will read to your Honor Mr. Young's minute of the 27th March, 1893:—

Before approving of this proposal I should like an estimate of the actual value of the work to be carried out by the contractors under the substituted scheme.

Mr. Young's explanation of that is contained in his evidence in reply to Question 7506:—

7506. What was your object? My object was this—that, however satisfactory the Monier arch system might be represented to me to be, I would not have accepted the tender without putting up the specification under the system for public competition, unless it had been reported to me that the actual work to be carried out under the system approached very closely to the departmental estimate for the contract.

Now, any Minister conserving the public interest would write a minute such as Mr. Young wrote, with the objection set forth in his evidence. He continues:—

7508. If you look at page 6 of the Parliamentary Papers ordered to be printed on 9th October, 1895, you will see the following minute by Mr. Hickson:—

To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm, estimates were made for the work on the Monier system, as well as on the department's designs. The result was that the estimate of both works was practically the same. Applying that comparison to this case, it would mean that the departmental estimate for the work under consideration would be £22,000.

Supposing the work in the outfall sewer construction were to a great extent cheaper than the original design for the contract, would you then have accepted the Monier system as a substitute at the same price? I cannot say that I should. I can only make my position clear. The reason why I did it was that it was reported to me that the cost under the Monier arch system would be practically the same as under the departmental plan.

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That is conclusive as to the way in which Mr. Young, the Minister, looked at this matter, and as to the way in which he took the replies of Mr. Hickson which were given to him. I will read to your Honor those replies. Mr. Hickson, for instance, wrote the following minute :—

To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm, estimates were made for the work on the Monier system as well as on the department's designs. The result was that the estimate of both works was practically the same. Applying that comparison to this case, it would mean that the departmental estimate for the work under consideration would be £22,000.

There can be no mistake about that. The report which Mr. Hickson referred to was Mr. Bagge's report of the 21st September, 1894. Mr. Bagge, in that report, drew out an estimate, or rather instructed the officers of his department, who took out an estimate. It was undoubtedly the work of the office, checked and rechecked. Upon one of these schemes the cost was £9 11s. 5d. per lineal foot, the cost of the second scheme per lineal foot being £6 16s. 11d. These two schemes were, according to Mr. Hickson, compared with the Monier scheme, the cost of which came out at £6 6s. 8d. per lineal foot. But your Honor can see that none of these three schemes had ever been adopted by the department. They were all based upon European patents of a certain description, and the comparison which Mr. Bagge really made was between them and Ahearn's Contract No. 101, upon which these estimates were made out by way of comparison. Now, that particular contract was essentially a work which was going on in the office. It contained small-span brick arches between piers of certain bulky foundations, and it was to cost £10 16s. 1d. The comparison, without a doubt, which was made by Mr. Bagge, bore out to a great degree, if it did not altogether do so, the former information which Mr. Hickson had sent to Mr. Young,—showing, as has been made clear to this Commission, that the adoption of the Monier system would reduce the cost of Government work on which it could be used by about 50 per cent. Your Honor put Mr. Hickson through a very close cross-examination in order to obtain an explanation of this difference; and, by reading Mr. Hickson's evidence, I would point out the way in which he makes the explanation. After your Honor had asked for a lengthy explanation on the matter, it was condensed into various set questions. I will quote the questions and the answers given :—

1553. I understand you to say, in point of fact, that Ahearn's plans were wasteful plans;—you mean as to cost, I suppose—the use of a large quantity of unnecessary material? I would not go so far as to say that. No doubt as we went on with our sewerage works we saw where we could save a good deal of material, and we did so.

1554. As between Contract 112 and Contract 77, what you say is that you have effected a substantial saving? Yes; reducing considerably the cost of the work.

1555. Was that done by reducing the co-efficient of strength, or by keeping up the co-efficient of strength and reducing unnecessary material? Yes; we found that keeping up a sufficient co-efficient of strength we had a large margin to go upon.

1556. Do you still say that you really did not understand the note appended to Mr. Bagge's report? I did not take it into account at all, because I was comparing two open aqueducts. Why the question of a triplicate closed sewer should be brought in was, to my mind, quite unintelligible.

1557. I understand that No. 2 scheme of Mr. Bagge's report had been worked upon then? No; it was worked upon as the result of the calculations then made.

1558. It had been worked upon before you wrote this minute? Yes.

1559. There was only an interval of six months? Immediately after Mr. Bagge's report had been presented the contract for No. 112 was got into hand on the basis of No. 2 scheme.

1560. And it was in the working out of the quantities that you came to certain results? Yes; the results are shown on plans No. 2 and No. 3, which I have put in.

1561. After arriving at these results the office drew the plans of No. 77? Yes.

1562. In drawing the plans of No. 77, were the plans under scheme No. 2 in Mr. Bagge's report borne in mind in any way? We bore in mind the result of our researches as to the cost of work upon No. 2 scheme.

1563. You had it in mind then that, as between No. 2 scheme in Mr. Bagge's report and No. 77, there was not much difference;—is that so? There was not very much. I have had the estimates all run out accurately since, and I can show you how they come out.

1564. How was it that in No. 77 the office did not go in for another experiment upon the basis of No. 2 scheme, but preferred to adopt the old system? We did not exactly adopt the old system, because in No. 77 we reduced the cost of our work.



1565. I mean so far as the brick arches and the closed carriers are concerned? The brick arches and concrete represent practically no difference in cost.

1566. Was it that you had concluded that brick arches, if not connected with unnecessarily expensive work, were practically no more expensive than concrete? There was very little difference in cost.

1567. So it was in your mind that only schemes Nos. 2 and 3 were to be compared. Although, in fact, No. 3, a different system from No. 2, was under comparison, what was really in issue as between the department and Carter, Gummow, & Co. was a comparison between No. 77 plans and the Monier system in No. 3? Yes.

1568. But you say that in your mind the comparison between the aqueduct work involved in No. 77 and the Monier system was the same as a comparison between scheme No. 2 and the Monier system? Yes.

1569. Because with the increased saving in your designs for aqueducts you had brought down the cost to something practically equivalent to the cost of No. 2? Yes.

1570. Whereas in Ahearn's Contract No. 101 the cost had been much greater than the cost of scheme No. 2? Yes.

1571. That is your explanation? Yes.

1572. Do you understand, then, that Carter, Gummow, & Co. were working on the basis practically of Mr. Bagge's No. 3 estimate in carrying out the work they were to do? On very much the same basis.

1573. That basis brought the cost down to a little less than the cost of No. 2? Yes.

1574. And you looked in the future to being able to reduce the cost still lower by reducing the quantity of material used? Yes.

1575. Very much below the quantity which appears in scheme No. 3? Considerably less. This is not mere theory. I can show you what was actually done.

Now, the explanation of Mr. Hickson, as contained in the answers to those questions, is this—that the departmental design for Contract 77 was not more costly than was the design for Contract 112. His explanation is that the design for Contract 77 was much cheaper than was that for Contract 101, and that, in comparison with other works also, it was very much cheaper. Your Honor has very carefully examined the plan, and you have had before you Mr. M'Credie and Mr. Thompson as to the comparative values of the different designs. The department has not put forward the slightest contradiction to their values. I wish to point out that it is undeniably the case that the design for Contract 77 is more costly than was that for Contract 101 by £1,250. This is illustrated by the evidence of both Mr. M'Credie and Mr. Thompson. They say that it involves an equal expenditure as regards the material, and, taking one design with the other, as Contract 64, which was Carson's contract, and which was a most expensive design. If you will take the plans and sections referred to by Mr. Cutler and other witnesses you will see, as they pointed out, that the side walls between the inner lining of the sewer and the exterior of the work is the same in Contract 77 as it is in Carson's Contract 64 and in Ahearn's Contract 101. There is no saving in material, and the thickness of the work and the quantities of material are the same. It will be seen on comparing the design of Carson's contract with it that it is exactly the same. Its stone cornices, its plynth moulds, its arches, its patent double-pressed brick facing—everything in its construction makes it identical with the other design. The only difference is that it has greater spans in the arches—that is to say, the arches are extended from 42 feet to 52 feet. As a counteracting element, the piers are greater and the arches more costly. It will be seen, therefore, that there has been no reduction from the date of the letting of Carson's Contract 64 until the drawing of the departmental plan for Contract 77. As to Ahearn's Contract 101, taking the material, and looking at the quantities of the material and the nature of it, there is not the slightest doubt but that Contract 77 is greatly superior and is more costly. Now, how comes it that Mr. Hickson can say that McSweeney's contract, which is an entirely different contract altogether—an open sewer, an open aqueduct, and drawn at the same time as was No. 77—was the one with which he was comparing a design with a closed-in carrier and such elaborate work as is shown upon the departmental design of Contract 77? That is the only explanation which can be given to justify this minute of Mr. Hickson's. It goes to indicate to the Minister that if the department had taken out an estimate it would have been found that the Monier patent would have cost the country £22,000. Your Honor must see that Mr. Hickson could not possibly make that error. He admits that he had Mr. Carter before him as to the sureties, and would it not be in accordance with common sense that he should then say to him, "Show me how you made up this estimate for the lump-sum tender. You must prove to me that you are not getting the best of the Government." Mr. Hickson must have known all along that this work would be done with a great amount of profit to the contractors who sent in the substituted plan. I come now to deal with the real cost of Contract 77. The first evidence I will take to prove that there was a great saving made upon the substituted plan, and, therefore, a great profit given to the contractors, is that

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of Mr. Gummow himself. The object of competition on the part of the Government is to bring in the brains of men, so as to obtain by the use of those brains in competition the execution of work at the cheapest possible cost. That is the object; otherwise we need not have competition at all. If the department deliver themselves over to a system under which the contractors can get the most expensive prices for their work, then the business of the department cannot be conducted in a proper manner. Both Mr. Gummow and Mr. Carter have admitted in their evidence that they put in their estimates for the departmental plan at cost price. It must not be forgotten, however, that Mr. McSweeney would have done the work for £16,300. Mr. Gummow submitted, when giving evidence, at page 649, the detailed quantities of the tender which the firm sent in at the time, when submitting the substituted scheme. He has also pointed out to your Honor that he and Mr. Snodgrass went through this estimate very carefully, in order to make up the price which they submitted in their tender, the full amount being £14,777. That would be for the whole of the contract, including £488 for plant, £750 for management, £200 for smith, and £300 for sundries—a sum of £1,738 over and above the cost of material put in. I submit that the prices of material given carry a very fair profit, as I will point out in detail further on. If your Honor separates the quantities in this tender of Mr. Gummow, you will find that the sum of £7,403 represents work which is common to both designs—the departmental design and the Monier design—and which is altogether outside of the aqueduct. If you deduct the £7,403, representing material not affecting the aqueduct, from the amount of the tender sent in, £15,500—the Monier work substituted, by the way, was nearly £800 in excess of the schedule they made out—you will find that they allowed for the construction of the Monier work £8,097. Now, Mr. Gummow's evidence will be found upon page 639. He said he very carefully kept a tally to see what the actual cost of the work would be to the contractors as it proceeded. He made this tally during the time the contract was going on, and he says:

19440. *His Honor.*] You assumed that the cost of the four would give you a fair average? Yes. I ought also to explain that the men were working eight a half hours a day and saving their Saturday. The arches at White's Creek are a little bit smaller in width, there being a smaller-sized sewer there, than are the arches at Johnstone's Creek. The quantity of 1,325 yards is not the whole total of the concrete and compo., but the estimate which I made as to the four arches at White's Creek. That would make a small difference. There may be 25 or 30 yards of concrete more than I have considered in my calculation. As to the blacksmith's work, it is almost impossible to get that item exactly, because the blacksmith is engaged in sharpening tools, drills, picks, and that sort of thing, as well as doing other work. He also has two men to assist him.

Now, when I asked Mr. Thompson and Mr. McCredie to make out their estimates of quantities in conjunction with Mr. Davis, I said to them "Deal with the matter in the fairest way you possibly can. Take Mr. Davis' estimates if they are not altogether too extravagant." There is no doubt that they did this, having regard to the designs themselves and the rather large amount which they gave. If your Honor will take the trouble to check the quantities in the Monier aqueduct work which were actually used, you will see that these gentlemen made a most liberal allowance for this material. Mr. Gummow, however, set that point at rest by stating that 1,350 yards of material were actually put into the work, from a check made by him as the work actually proceeded. He makes out that this will cost at per cubic yard £3 14s. 6d., or we will call it £3 15s. Multiply 1,350 yards by £3 15s., and you have the sum of £5,060, including supervision and everything. So that the difference between the original tender made out by Mr. Gummow of £8,097 for this Monier work—because I am not taking the aqueduct with the piers, but simply the Monier work rising from the springing of the arches—the difference, as I say, is this—that Mr. Gummow allowed £8,097 in his estimate, the actual cost being £5,062. So that there is no doubt about it that there was a saving of £3,035, which bears out every witness who has been before this Commission, including the Government officers, in their contention that there is a great difference in price between the two designs. The departmental scheme was tendered for by Messrs. Carter, Gummow, & Co. at the admitted cost price of £15,757. If you deduct from that Mr. Gummow's figures, £7,403, you are left with an item of £8,354 to be used in constructing the departmental design with the departmental material above the springing of the arches. That shows that they received for this Monier work, which is so much cheaper in construction, £3,285 of benefit, there being included in both the actual and estimated cost put forward by Mr. Gummow £488 for plant, £750 for management, £200 for smith, and £300 for sundries, the tenders upon the departmental plan being at neat cost. Let me proceed, your Honor, to point out what evidence we have produced before you as to the value of this work. Mr. McCredie and Mr. Thompson went very carefully and minutely into the quantities. Their evidence is to be found upon page 344. Now there is no doubt that these gentlemen acted honestly and in every way properly in arriving at that value. They had nothing to bias them. They had no desire to injure the department. They received but a very small remuneration, and they simply did their duty as independent witnesses before this Commission. They have proved, by taking the market rate for material and labour, that if  
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the original design had been carried out in compo. instead of concrete, there would have been a saving of £4,000 odd. Even if it were carried out in concrete, there would have been a saving of £3,633. Mr. John Young, who certainly is not a man without experience—he is a man, on the other hand, who has had a lifelong knowledge of concrete work—having made it a specialty in his own buildings, and having at all times taken an interest in that particular class of work, having even built houses completely of concrete—has given your Honor an estimate that there would be a saving in favour of the contractors by the substitution of this design over and above every expense which could be legitimately put upon it and the ruling percentage of profit at that time, which was not large, of £3,361. Mr. Alexander Dean has also carefully examined the figures given by Mr. McCredie. He gives upon page 365 of the printed evidence a description of how he and his son went through the estimate, and came to the conclusion that Mr. McCredie and Mr. Thompson had certainly not placed exorbitant values upon the work. I come now to the estimate of Professor Warren. He produced before this Commission a very carelessly drawn-up statement. I do not like to say hard things, but, seeing that Professor Warren was coming before a responsible Commission which had to go so deeply and seriously into so grave a subject, he should not have come here with an ill-prepared document, which certainly does not reflect very much credit upon a man holding such a high position. In this document, as your Honor is aware, there were sundry mistakes found, and all these mistakes—mistakes in simple arithmetic—had to be worked out to make a certain result. When the mistakes in addition and multiplication were pointed out, it was found that they made a considerable difference in Professor Warren's evidence, and, even as it stands now, the addition in some cases is not quite correct. I believe the addition in the case of the material not included in the Monier work is not quite accurate, although, of course, it may have been corrected since I last saw it in type. In any case Professor Warren had to admit that there was a difference between these two works, although he loaded up his estimate with wheelbarrows, sheds, waste material, profit, 15 per cent. commission, and goodness knows what—a difference of £2,397 between the values of these two works. The department itself has submitted an estimate, which appears in the Parliamentary return of the 22nd October, 1895, page 208. An estimate will there be found of the value of the work to be performed on the Johnstone's and White's Creeks aqueducts, and the value is set down at £12,501. Now, with all their efforts at building up the material to the very utmost, the department can only make the figures come to £9,400—that is, they have to admit that there is a difference of £3,000 between the two designs—their own design and that submitted by Carter, Gummow, & Co. Can there be any doubt whatever as to the difference between the value of the two works? It is evident that an artificially-made cement structure must be cheaper than an elaborate chiseled stonework, pointed, and faced with double-pressed bricks, containing also the best class of concrete and other correspondingly expensive material. Let me refer your Honor to Mr. Hickson's statement upon this very question:—

1574. And you looked in the future to being able to reduce the cost still lower by reducing the quantity of material used? Yes.

1575. Very much below the quantity which appears in scheme No. 3? Considerably less. This is not mere theory. I can show you what was actually done. You will see in the book I hand you an illustration of a bridge which has actually been built. The span is 121 ft. 4 in., and the thickness of the crown is only 6½ in., whereas our Monier arch at Johnstone's Creek has a 75-ft. span and is 12 in. thick.

1576. What weight is the bridge to which you are referring calculated to bear? The bridge I have shown you was tested on 14th November, 1890, in the presence of the President of the Zurich Association of Engineers, firstly, by submitting it to an evenly distributed load over one half of the arch, equal to 61 lb. to the square foot, and no measurable deflections could be recorded. It was secondly tested by a moving load of 5 tons being drawn across the bridge, when no vibrations were recorded by the gauges on the loaded or unloaded portions of the bridge, which results were considered satisfactory.

1577–8. This was, as a matter of fact, an experiment;—you thought it would involve no serious risk, and that there would be no extra cost, and that although there would be a small saving only at present, it would probably lead in the future to a great saving, because you contemplated reducing the quantities of the material used? Yes. But with regard to what you say as to the risk, there was absolutely no risk at all, because we put the whole responsibility upon the contractors. Most modern engineers believe in this system, and I wanted it introduced without any risk to the department. Although the saving in this particular structure is practically nothing—that is, only about £200—I am quite satisfied from information which I now have from what has actually been done and from calculations which have been run out, that we shall be able to adopt this style of bridge at a very considerable reduction in the cost of the works.

We are dealing here with an aqueduct the walls of which are only 4½ inches thick, the lower portion of the invert being only about 6 inches thick. The arches have a span of 82 feet. There could be

no reduction in the cost of either the piers or the aqueduct; the only possible reduction which could be made in the cost would be in the arches alone; and, taking the material in these seventeen arches at £3 16s., the value put on the material by the Government officers, the thickness being reduced from 12 inches to 6 inches, the saving would be only about £500. That would be the only amount which, upon a most liberal estimate, could be saved in a value of £9,400, which is nothing like 50 per cent. of saving—in fact, it is hardly worth speaking about. There is no explanation in the evidence of Mr. Hickson upon this point; and I contend that there can be no explanation as to why he did not tell the Minister the true cost, other than this—that he wished to give a friendly consideration to these contractors, in allowing them to receive a sum of £3,000 from the State, which they could not have got if the work had been put up to legitimate and proper competition, which, by the way, would not have taken more than a month to do. Let us examine other portions of Mr. Hickson's minute in reply to the request of the Minister. He says—

To comply with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm, estimates were made for the work on the Monier system as well as on the Department's designs. The result was that the estimate of both works was practically the same. Applying that comparison in this case it would mean that the departmental estimate for the work under consideration would be £22,000.

Supposing that it had taken a week to do it, is that not a fair hindrance? Can it be said that there was any inclination on the part of an officer who wrote such a minute as that to in any way assist to get this work carried out at the cheapest possible cost? As a matter of fact, Mr. McCredie and Mr. Thompson gave evidence that in three days they took out the quantities and made their estimates. Evidence has been forthcoming which shows that a period of nearly two months elapsed between the time of the signing of the contract and the time when the minute to which I have referred was written. There was therefore plenty of time, had Mr. Hickson wished to do so, in which to call for tenders. As to the question of any contractor's being at liberty to put in plans and a tender of his own upon those plans, what possible chance had other contractors who were asked to tender upon the departmental design of putting in an alternative design? Had they an officer in the department who was in a position to get them information, for instance, as to the length and capacity of the aqueducts, or to furnish them with other particulars which are in every sense office property? They had no officer and partner in the department like Mr. Baltzer to do that sort of thing for them; and, if such a thing is to be permitted, we might as well make the practice general—dispense with our officers, and keep only the head of the department, calling upon all contractors to send in their own schemes as well as their own prices for any work which is required. Look at the matter in any way you like, no reasonable explanation of the conduct of Mr. Hickson in writing that minute offers itself. I will now deal with the question of sureties. This was a very risky work, as far as the department knew. At all events, if it is not so considered now, it certainly was then, and the Board of Reference and the Minister thought it advisable that substantial sureties should be taken to safeguard the interests of the State. They made that recommendation in the performance of their duty. Mr. Hickson was required to get sureties, and he admits that Mr. Carter himself came to him and submitted his sureties verbally, whereupon they formed the subject of a conversation. Would you not think that Mr. Hickson, who, in the case of Ahearn's contract, was so very careful to ask if Mr. McArdle had property in this country, which might be held if anything went wrong, would have asked Mr. Carter at that interview whether Mr. Forrest and Mr. Gillan, whom he admits he knew to have been connected with the firm for years in various contracts, were not really contracting with the other members of the firm for Contract 77. In order to introduce this branch of the subject, I will first of all read the letter which Mr. Hickson wrote on 5th April, 1895:—

The accompanying letter of 4th April, 1895, from Messrs. Carter, Gummow, & Co., is a protest against the stringent supplementary specification prepared by Mr. Norrie, at my suggestion, with regard to the alteration in the design of Contract No. 77.

Messrs. Carter and Gummow ask that their own "personal sureties for the amount named," *i.e.*, £12,000 (an amount which they do not dispute), "should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work."

They go on to say that they are "a firm of sound financial standing, well and favourably known to the department as contractors." This is quite true. They are a firm in which I have every confidence. They have done a great deal of work under me, and I can testify that their aim always has been to turn out the very best class of work possible. At the same time, misfortunes happen the very soundest firms of contractors, and the department must look a little way into the future.

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Does not a paragraph of that nature really indicate that Mr. Hickson knew, as any intelligent man must have known, what was his duty to the State under such circumstances. No man without a thorough knowledge of his duty could have penned such a passage. He continues:—

Their own bond for £12,000 would be really of no use if they were unfortunate enough in the meantime to become bankrupt.

Plainer English words could not be used, showing that Mr. Hickson knew what was his duty as regards finding out exactly who these sureties were. He continues:—

I think, therefore, it is right that the sureties should be insisted upon. They give the names of two men—Mr. George Forrest and Mr. James Gillan. From inquiries made, I believe these men to be financially sound, and I think, if their names were accepted as sureties in the penal sum of £6,000 each, the department would be secured as far as it is reasonably possible to be.

Now the enormous sum required in the form of these sureties is in itself, as Mr. John Young pointed out to your Honor, enough to create suspicion in any intelligent mind as to the *bona-fides* of the sureties. Mr. Hickson says:—

From inquiries I have made, I believe these men to be financially sound.

What inquiries did he make? Might it not have been expected that he would make inquiries from Mr. Carter as to whether these men had an interest in their business—whether their property was not contained in the business of Carter, Gummow, & Co. Your Honor will see from the evidence what really did take place. Mr. Hickson, upon page 177, says:—

6541. How did Mr. Carter submit the bondsmen to you;—was it done in writing? I could not tell you that from memory.

6542. What I want to know is, how you came to get the bondsmen submitted to you? It was done either in writing or verbally. The papers will probably show it. I presume it was done in writing. It is nearly always done in writing.

A few days ago Mr. Hickson said that the only interview he had with Mr. Carter was the one in reference to this matter, in which he submitted the two bondsmen. He goes on to give this evidence:—

6545. Do you remember where your conversation took place with Mr. Kane? I know Mr. Kane pretty well, and I have had various conversations with him. The conversation I specially refer to took place, I think, on the Adelaide railway station.

6546. Do you know how it came about? We were talking about the firm generally, and, as an official of the bank, he spoke in the highest terms of the firm; in fact, the expression he used, as far as I can remember, was that he would trust any one of the firm to any extent, and that they were all well-to-do persons.

6547. He was then speaking of the firm in Adelaide, was he not? He was speaking of the firm generally. Mr. Gillan was in Adelaide at the time.

6548. Who were the members of the firm whom you knew to be there? Mr. Gillan and Mr. Gummow were the two who were in Adelaide then.

6549. Mr. Forrest, I understand you to say, was spoken of too? Yes. He was not in Adelaide.

6550. But he was a member of the firm then? Yes, upon some of the contracts.

There is therefore clear evidence of Mr. Hickson's knowledge of the connection of these men with the firm of Carter, Gummow, & Co., and it is hard under those circumstances to account for his minute which I have read. Further on he gives this evidence:—

6551. What gave rise to the conversation you had with Mr. Kane as to the firm;—what led to their names being mentioned? I think it arose in this way: He knew my son was then in Adelaide, and he said it was a very good firm for a young fellow to be with. In the course of our conversation he spoke about the members of the firm generally.

6552. You had known Mr. Kane before then? Yes, a long time.

6553. Did you meet him by accident on the railway station at Adelaide? I think he knew I was coming, and came down to meet me.

6554. That was on your arrival? Yes; I saw him three or four times in Adelaide, I think.

That is the only explanation Mr. Hickson has ever given as to his representation to the Minister—

From inquiries made I believe these men to be financially sound.

That was a long time—a very considerable time—before this contract ever came up—indeed, before it was ever thought of. Further on Mr. Hickson, in reply to Mr. Smith, gave this evidence:—

6555. *Mr. Smith.*] Has the opinion you have expressed in your minute as to these two men being financially sound been confirmed lately? Yes, abundantly confirmed.

6556. Could you specially refer to any way? First of all the bond was taken, and that confirmed my minute.

Do people in a responsible position like this, dealing with such responsible business, rely altogether upon a simple bond being signed? He continues—

But quite lately I had a communication from the manager of the bank here, and he said that, if there were any question at all in connection with the matter, if I would refer to him he would furnish particulars.

6557. You are referring to the manager of the Bank of New Zealand? Yes, or to the sub-manager; I forget which. He said he would give any information necessary as to the stability of the firm. I think Mr. Gillan's name was specially mentioned.

Here is the point. He says—

But quite lately I had a communication from the manager of the bank here, and he said that, if there were any questions at all in connection with the matter, if I would refer to him he would furnish particulars.

What was the evidence of the bank officials? Take the evidence of Mr. Wilson, the former manager of the Bank of New Zealand, which appears on page 198:—

7280. Had you lately any conversation with Mr. Hickson concerning Mr. Forrest or Mr. Gillan? I had a conversation with Mr. Hickson about the firm, I think, and the names of Mr. Forrest and Mr. Gillan may possibly have been mentioned.

7281. As members of the firm? Yes.

7282. On what date was that? I suppose it would be about six weeks or two months ago. The matter was mentioned incidentally in conversation.

7283. What did you then report? I reported that Mr. Gillan was a man of some means.

7284. What property had he in New South Wales? That I do not know; but I know that he has means.

7285. How do you arrive at that conclusion;—had Mr. Gillan a very extensive business with your bank? Not very extensive; but it showed that he was a member of a firm who were carrying on large contracts, and, moreover, that he could afford to have money idle.

7286. In what concerns was he interested? He was a member of the firm of Carter, Gummow, & Co.

7287. Was he a full-share partner? I do not know anything about that. I never had any business with him connected with the firm. Mr. Carter always transacted the business of the firm with me.

7288. Do you know the state of Mr. Gillan's account in the months of May or June, 1895? I could not say now what it was; but I know that he was a man of means.

Mr. Wilson points out clearly that if Mr. Hickson said that he had seen the manager of the bank the statement could not refer to him, because he had left the bank some twelve months before. He says that his knowledge of Mr. Gillan was that he was a member of the firm of Carter, Gummow, & Co., and that he came to a judgment of his means simply because he was interested in that particular firm, which was carrying on large contracts. What was Mr. Parfitt's evidence? Your Honor will find it on page 288. This, I presume, is the gentleman with whom Mr. Hickson must have had communication. He gave this evidence:—

9921. *Mr. Parkes.*] On July 6th of this year, Mr. Rigg, your assistant manager, was a witness before the Commission, and he said that he did not know your business or connection with certain questions, otherwise you would not have been asked to attend to-day;—two days before Mr. Rigg came here, was not Mr. Hickson in your office? I could not answer that question.

9922. Did he not see you? No; I never saw him in my life to my knowledge.

9923. Mr. Hickson has said before this Commission, in answer to questions, that he had a communication from the manager or sub-manager of your bank, in which he said that if any question arose in connection with the sureties of Mr. Forest and Mr. Gillan, if the matter were referred to him he would furnish all particulars;—did you send that? It is quite possible that such a communication may have been sent from the office. Personally, I had nothing to do with it.

9924. And you say you have never seen Mr. Hickson in your life? I have not to my knowledge.

9925. Mr. Hickson in his evidence said that the manager or sub-manager of your bank had said that he would give any information as to the stability of the firm, and he thought that Mr. Gillan's name was specially mentioned; Mr. Rigg, in his evidence, said that no inquiries had been made of him;—did you have any conversation with Mr. Rigg about this matter at all? No. The names you are using now are hardly familiar to me.

9926. You never had any conversation at all with your sub-manager as to the sureties of Mr. Forrest and Mr. Gillan which were given to the Works Department? No.

9927. On no occasion? No.

9928. You never heard from any of your officers whether Mr. Hickson was on July 4th at the bank? No.

Your Honor will see that Mr. Parfitt is not the gentleman who supplied Mr. Hickson with the information. Then take the evidence of Mr. Rigg, the sub-manager, which appears upon page 197.

7228. *Mr. Parkes.*] What is your present position? I am assistant manager of the Bank of New Zealand.

7229. What were you in the Bank of New Zealand in the year 1895? Assistant manager.

7230. In April and May of that year? Yes.

7231. Prior to the month of July in that year, were any inquiries made of you as to the position of Mr. Gillan and Mr. Forrest as sureties in connection with any Government contract? Not that I know of.

7232. No inquiries were made of you? None.

7233. Not through the Bank of New South Wales? Not to my recollection.

7234. Do you remember any being made by any officer of a Government department? As far as I can recollect, none were made by anyone.

Further on he says—

7246. Have you lately informed Mr. Hickson that he can rely upon these men as sureties? No I never informed him about them at all.

7247. Has he spoken to you about them lately? He asked me the other day if any inquiries had been made of me, and I said that there had not been.

7248. On what date was this? Two or three days ago.

7249. Did he then ask you about the position of these gentlemen? Not directly. He asked me if I had reported to the department concerning them, and I said I had not. I do not remember at this moment whether he asked me about them directly; but I think I told him I considered them men who were worth about £5,000 each.

He also gave this evidence—

7261. What in 1895 was the state of the general financial credit of Mr. Gillan? We looked upon him as a man worth £4,000 or £5,000, being in the position in which we supposed him to be as a member of the firm of Carter, Gummow, & Co.

The inference is that otherwise he would not be worth the amount. I come now to Mr. Darley's evidence with reference to this matter. Your Honor will find it upon page 178—

6583. This was a peculiar case—this security given for the permanence of the Monier work. I suppose that, under the circumstances, you would look into the question of sureties more particularly than in any other case? I was dealing with cases of sureties almost daily, and I cannot exactly remember the report. I remember that the substance of the report was that I thought the sureties might be accepted. I must have received a favourable answer as to the substantiality of the men before making the report.

6584. This is the first time you ever had to take sureties for the work in that way? I cannot call to mind a previous case of the kind, or rather a case exactly parallel. I do not think we had a parallel case. We take security for permanence of the work in the case of a reservoir. In that case the contractor has to be responsible when the water is turned on. When we have not been ready to turn the water on, we have taken securities from the contractors in order that they might be paid off, to secure any defective work being afterwards made good; but I do not remember a parallel case to that of Contract 77.

6585. Therefore, I suppose you would be very far from looking on these sureties as a mere matter of form? I certainly made inquiry in the usual way, and I must have received a favourable reply.

Mr. Darley said in his evidence that he directed a Mr. Conley to make inquiries. That gentleman came before the Commission and stated that he had not made any inquiries, and that no officer of his department, as far as he was aware, had made any. It is probable, therefore, that Mr. Darley may have meant to make these inquiries, and in consequence of the confusion in his office which prevailed at that particular time may have omitted to do so. Mr. Hickson, however, was the officer who had to do this work, because he had not then handed over his duties to Mr. Darley; or, had he done so, it was curious that he should have continued to transact the business of the branch until Carter & Co.'s contract was completed and fixed



fixed up, and that he should then have handed it over. There was no reason why he should have left this particular matter of the sureties to Mr. Darley. He seems to have gone out of his way to deal with this transaction, because the branch had been transferred to Mr. Darley before that date. I want to impress upon your Honor that there could not have been, judging from the evidence, any inquiry at all as to the financial state of these men—as to whether they had an interest in the firm's business or not; and this particular paragraph of Mr. Hickson's letter, taken in conjunction with his statement to the effect that their own bond for £12,000 would be really of no use, has very much the appearance, I submit, of deceiving the Minister. Let us examine for a moment the nature of these sureties. Who were they? Mr. Forrest and Mr. Gillan were known to have been connected with the firm of Carter, Gummow, & Co., in and out, for a great length of time upon different contracts. This being so, ought not the department to have made themselves absolutely satisfied upon the point, whether they were connected with the firm in this particular contract before they signed the bond? Although the greatest effort has been made before this Commission to cloak up the whole matter, and to prove that Mr. Forest and Mr. Gillan were not interested in the firm as regards this contract—that they were not partners—I think your Honor will see, from their own admission, which I shall read, that, although they did not, as persons often do in difficulties, fix their property upon their wives, or adopt other methods of putting themselves beyond financial responsibilities should they get into difficulties, the firm so fixed their contracts as to use part of the members as tenderers, and part of the members as sureties; dodging about in that way, instead of endeavouring to escape their proper financial liabilities by other means. Can that be called good and proper business with the department. Is it a kind of business which anyone, viewing it judicially, could condone? The only explanation which has been put before the Commission consists in elaborate evidence as to the reasons why Mr. Forest and Mr. Gillan were not members of the firm of Carter, Gummow, & Co. It is alleged, for instance, that they were not members because their names did not appear in the tender—because they had fixed up between certain members of the firm a deed with certain incongruous statements, but which, at the same time, binds them together as partners in contracts as conclusively as possible—in the particular contract in dispute as well as in other contracts; especially would that be found to be the case if there were any dispute in law as to a settlement between the various parties upon one of the contracts. I think your Honor will dismiss that subterfuge in regard to this particular contract. I will ask you to take Mr. Forrest's and Mr. Gillan's own admission, which ought at once to put an end to argument as to their true position. It is conclusive, from their own statements, that they were members of the firm and that the whole of the money they had was in the firm's business. Mr. Forrest gave this evidence:—

6917. What is the salary you receive from Messrs. Carter, Gummow, & Co.? £10 a week.  
 6918. What would it be for? For management and work.  
 6919. Do you receive it as a partner? Yes, as a partner; we all draw alike.  
 6920. Do you receive it whether you are managing or not? Yes; if there is any work to do we always draw the same salary.  
 6921. Suppose there is no work to do? We have to do with half salary then.  
 6922. I understand that there are a good many of the firm's contracts in which you have been concerned, and a good many in which you have not been concerned? I have an interest in them all, although my name does not appear in them all.  
 6923. You have actually an interest in them? Yes.  
 6924. Then you have been a partner in the firm all along? Yes; from the first.  
 6925. From how long ago would that be? Over eight years.  
 6926. In cases where your name has not appeared in the contracts, have you been still a partner? Yes; still a shareholder.  
 6927. How have you shared in the profits of contracts in connection with which your name has not appeared? Just the same as in the others.  
 6928. Just the same as in those in connection with which your name has appeared? Just the same.

Mr. Gillan also clearly admitted in his evidence that he had been a partner all through, and that he drew an equal salary with the other partners. I need not read his evidence on this point. His partnership in the firm and the fact of his drawing a salary are placed beyond the possibility of doubt when that evidence is perused. What is the use of endeavouring to prove that he did not join the firm, then, until this contract was completed? These two gentlemen themselves admitted that they drew money from the firm in virtue of their interest in it. Mr. Forrest says he drew money for a period of eight years, and that, whatever their profits may have been, he drew his proportionate share; that if there was any loss he had, like the rest of the members, to share it. The same conditions appear to have obtained as to Contract 77. At all events, they admit that they drew their share of the payments in respect of the contract That  
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Mr. Hickson knew of their being members of the firm there is, in my mind, not the shadow of a doubt. I wish now to show your Honor what looseness and laxity in the discharge of duty has been shown by the junior officers of the Public Works Department. Mr. Norrie, for instance, had these sureties sent to him, and he drew up a bond which he placed before these contractors for signature. Mr. Forrest signed a declaration in these terms:—

STATUTORY DECLARATION.

I, George Forrest, of Marrickville, in the Colony of New South Wales, householder, do hereby solemnly declare and affirm that I am possessed of property to the value of £6,000 sterling and more, and that such property consists of—Freehold property, £5,700; cash in bank, £300 sterling. And I make this solemn declaration as to the matters aforesaid, according to the law in this behalf made and subject to the punishment by law provided for any wilfully false statement in any such declaration.

Taken and declared at Marrickville, this 1st day }  
of June, 1895, before me,—

GEO. FORREST.

ROBERT ANDERSON, J.P.

Mr. Gillan signed a similar declaration adding an affirmation to the effect that he had landed property in the colony. In addition to his statutory declaration which has been put before this Commission we have had Mr. Gillan's own evidence to the effect that he had no land in the Colony, and that the only real substantial item towards the £6,000 of value mentioned in his declaration was the £3,000 odd of interest which he had in the firm of Carter, Gummow, & Co. Mr. Forest came before this Commission, first of all, and made a statement to the effect that he was the owner of the Lodge property at North Sydney, which statement he corrected at a subsequent sitting of the Commission. It is very likely that his first statement was the result of pure inadvertence. It appeared from his subsequent examination, however, that he had only a share in the Lodge property. Mr. Carter's and Mr. Forrest's evidence is to the effect that, although he had a share in that property, the deeds are really in the name of Mr. Carter.

*Mr. Andrews* : The certificate of title is in the names of Messrs. Carter, Forrest, and Snodgrass.

*His Honor* : Yes ; that mistake was corrected afterwards by Mr. Carter himself. It was proved that Mr. Forrest had only a share in the property.

*Mr. Parkes* : We will assume that Mr. Forrest has a third interest in the property ; and, even if that be so, we had Mr. Greig, of the firm of Richardson and Wrench, before the Commission, and he clearly set forth the value of the properties held by members of this firm at the time these bonds were signed. It can be seen from the evidence that Mr. Forrest, independently of his interest in the firm of Carter, Gummow, & Co., was not worth the amount set forth in his bond. We can spare them, however, so far as that is concerned, because, after all, the question lies absolutely in the negligence of the office in taking this kind of surety, and in taking partners of the firm as substantial securities in the case of an accident happening. It might be that from very sudden changes from high to low temperatures, as has been suggested before this Commission, this particular work at White's and Johnstone's Creek may crack in such a way as to render it necessary that the whole of the structure should be taken down, and in that case, the piers being 82 feet apart, they would not be available for the departmental design for the work in the event of reconstruction being necessary. The entire structure would have to be re-built, and in that case how could the department obtain any remedy from Carter, Gummow, & Co., if, between the present time and the period of the possible reconstruction of the work, the firm were to become bankrupt. Business is business ; sentiment of any sort is not a thing which belongs to business. There is no such thing as sentimentality in business matters, especially in business dealings with the State, where there must necessarily be a hard and fast line for the regulation of the rights of institutions and individuals, and where proper business methods must, for the same reason, be adopted. We must not look at this question from the point of view of Messrs. Carter, Gummow, & Co. being particularly generous and thoughtful persons who would strain every nerve to do what was right as alleged by the Department. The question must be looked at from the point of view of any ordinary contract into which the State might enter. It is necessary that the State should secure itself beyond all possibility of loss. Having that in view, this description of bond ought not to have been drawn up in connection with this contract. There can be no answer, I submit, to that. There is not the slightest doubt but that Mr. Hickson knew—he must have known—of the position of these sureties, and why could he not have said in his minute to Mr. Young, "Messrs. Forest and Gillan have formerly carried out contracts with Carter, Gummow, & Co. They have appeared in connection with former contracts as members of the firm." He did not, however, do so. Had he taken that course, the Minister, being a reasonable man, would have said, "You must find out whether Mr. Forest and Mr. Gillan are concerned with the firm in this particular contract." But nothing of the sort happened, because Mr. Hickson sent in their names in the most definite language, as if wishing the Minister to believe that Mr. Forrest and Mr. Gillan were persons who had nothing whatever to do with the firm of Carter, Gummow, & Co.,  
but

but were absolutely independent persons. The Minister, of course, accepted Mr. Hickson's recommendation. Mr. Darley added his acceptance; but I suspect that Mr. Darley really looked upon Mr. Hickson as being the person who made inquiries, and that he trusted implicitly in him. He wrote the minute which is attached to the papers. Mr. Young naturally approved of the acceptance of the sureties, as, of course, any Minister would do with such a definite minute. In his evidence, however, he put the full responsibility upon the shoulders of his officers, and how those officers are to explain the affair away I cannot say, for it is impossible to say that this is the proper way in which to conduct Government business, there being such a plain and simple and well-recognised way of transacting that particular business—a way which, one would think, would appeal to every man with a grain of common sense. I come now to the evidence as to how this substituted plan came to be submitted to the department at all. I will refer your Honor first to the evidence of Mr. Young and Mr. Barling. The latter gentleman, being at that time the Under Secretary of the department, said, in reply to Question 7422, that he was assured as to the cost of the alternative design. He subsequently gave this evidence:—

7426. Supposing when the quantities were taken out and the price reduced by 28½ per cent. it showed a difference as between the two designs of £4,125, what would you have said? I should have said that it would be perfectly outrageous to accept the tender. If it were shown that the adoption of this Monier principle would mean a saving to the contractors of £4,128, I should say that it would be perfectly outrageous for anyone to recommend it. I do not believe for a moment that Mr. Hickson or Mr. Darley in their wildest dreams could have imagined such a thing.

That was Mr. Barling's opinion of the business of allowing the contractors to make this difference between the two plans submitted. Mr. Young also expressed the opinion that he would not have accepted Mr. Forrest and Mr. Gillan as sureties if he had had the slightest knowledge that they were connected in any way with the firm's contracts. At Question 7518 he says:—

I should not think there would be any objection to them if they were not partners as regards this particular contract.

That shows the manner in which the heads of the department would view this kind of transaction, and that is the way in which every sensible man would view it. I come to the connection of Mr. Baltzer with this plan. No doubt every invention which goes to cheapen the construction of public works is beneficial. No doubt inventions are sometimes desirable things to introduce. But there is a proper way and an improper way of introducing them, and an office such as the Public Works Department ought to be free from any suspicion whatever in such a matter. If a patent is known of, the State should not be delivered up, with its hands tied, to the holder of that patent. It was known that Mr. Baltzer had this patent, and that he was an officer of the department. A description of the patent has been given very clearly by Mr. Selve, and by an officer of the Patents Office; and I think your Honor will be convinced that it lies only in a little wire connection at the intersection of the bars and rods, and that if a connection of any other description were used there can be no doubt but that these contractors could not maintain the patent. The use of iron and concrete in various forms was illustrated by Mr. John Young and by other witnesses. Iron has been used in concrete construction in this country and in other countries for many years, and the State must be allowed to have the free use of common materials such as these without being tied hand and foot to pay a certain patent-holder upon an arrangement worked out in that patent-holder's interest, the patent-holder being, moreover, an officer of the department who is supposed to be looking entirely after the State's interests.

*His Honor*: I do not profess to have any special knowledge of the law of patents. If you can refer me to any good work on the subject, Mr. Parkes, I shall be much obliged to you. I cannot, however, at the present time, exercising my common sense, accept Mr. Selve's view as to the tying as being at all a material part. It strikes me as being a purely accidental part, the real principle of the system being involved in the placing of the bars in relation to one another. The questions of size and of approximation seem to me to be important elements, but the tying of the bars appear to be almost an immaterial element. Mr. Selve may be perfectly right, but, until I am satisfied that he is, by reference to some good work on patents, I cannot accept his opinion.

*Mr. Parkes*: Of course I am not able to dispute a question of law with your Honor.

*His Honor*: I am looking at the question now from the point of view of common sense, and not as a matter of law.

*Mr. Parkes*: Looking at the matter from the point of view of common sense, I say that the country will have to pay 15 per cent. over the entire cost of construction of Contract 112.

*His Honor*: That is another matter concerning which I will not express an opinion. There is, I think, a great departure there from the principle of the Monier system. It is a matter of degree. That, however,

however, is another question. What I wished to convey to your mind was that I could not accept, without some authority beyond Mr. Selfe's own opinion, that idea of his that the most important element in the system was in the mode of tying the bars.

*Mr. Parkes* : I presume that some day the question will be tested in a court of law, and it will then, in all probability, be settled. I could not produce authorities to your Honor in support of Mr. Selfe's view, but, dropping that aspect of the question altogether, I would take it upon another ground. I will admit for the time being that the patent is one which can be maintained. I still contend, however, that the State ought to have the right of use above private individuals, and upon the most economical terms, because it furnishes all the machinery and protection for patent-holders. Now, there was an officer in the department—an officer, according to the evidence, of very high standing—I mean Mr. Baltzer—who took out this particular patent from information which he received from abroad. He intended, without the slightest doubt—and that can be seen from his subsequent action—to so utilise it as to obtain the greatest possible benefit from it at the hands of the State, his employers. In order to do that he looked round to find some men whom he could utilise as outside agents or partners in the working of the thing, it being impossible for him to do everything himself. With this object in view, he allied himself with Messrs. Carter, Gummow, & Co., who then began to approach the office. Mr. Carter himself has told us that at that period a patent, which was called the "Patent Grip," was being foisted upon the State at a considerable figure, and he thought that he might as well endeavour to get the Monier patent accepted also, since the State paid in such a liberal manner for these things. He set to work accordingly, and Mr. Baltzer produced a book containing information of every description upon the patent, which was left with Mr. Hickson. Mr. Hickson became impressed with the importance of the thing, and the matter generally was worked up to a point of great interest. Mr. Hickson seems to have allowed himself to be a very malleable material in the hands of these gentlemen. He not only took this book and perused it, but agreed to pay 15 per cent. for the use of the patent, in a very dubious fashion, as I consider. Quite apart from that, the department made tests and took all manner of interest in promoting the patent. They also went to elaborate expense in constructing and pulling down a culvert in order to promote the interests of this particular officer, Mr. Baltzer, and of these particular contractors. Now the proper course to have taken in this matter, I submit, was to have said to these patent-holders, and, first of all, to Mr. Baltzer: "As you are an officer of the department you will not receive any interest in this matter until it has been approved of by the Government, and then you must not remain here working in the interests of the patent. You must take your interest in it as a proper partner of these contractors." The department should have said to the contractors: "We will test this patent for you if you will take the responsibility of the test, and if you can prove at your own expense, and not at the expense of the State, that it is a good thing, we will accept the patent and pay you so much royalty. You will derive a future benefit from its having been proved to be a good thing. If it does not turn out to be a success we will not pay you anything for the test." The Government is not supposed to supply contractors or others with means of perfecting and proving by test various patents, even in the interest of future saving to the department. The cost should be borne by those who are seeking to have the monopoly granted to them by the State. This Monier patent was introduced by Mr. Baltzer, and was accepted by the office in the manner I have described. Mr. Baltzer has given evidence before the Commission that he drew the plan—and a carefully drawn plan it was—not with the intention of submitting it, but simply from a love of making designs. It is a strange thing, however, that in its details—in the calculations in everything—he made it exactly fit in with the piece of work in connection with which it was subsequently used. Is it contended for a moment that, seeing that the office went so elaborately into the design for this contract, calculating the carrying capacity, and making all the other necessary calculations, Mr. Baltzer did not calculate the small comparative cost of this particular design side by side with the office design? The evidence behind the scenes proves conclusively that there cannot be a doubt about it—that Mr. Baltzer, Mr. Carter, and Mr. Gummow, put their heads together and saw that there was a really good sum of money to be made by getting this patent introduced in this particular position. Of course there is the question whether Mr. Hickson knew that this officer was preparing this plan for this special purpose or not. Mr. Hickson has said in his evidence that he did not know anything about this plan until it appeared in the tender-box. He has said that lately, but at an earlier stage of this inquiry he gave this evidence, in reply to my questions:—

1579. *Mr. Parkes*.] Why, when the department was calling for tenders for Contract No. 77, did you not call for tenders upon two schemes—one upon the office plan and the other on the Monier patent? I considered the question, and I came to the conclusion that it would be better not to do so, because calling for tenders upon the Monier principle would be leaving it in the hands of only one firm of contractors to tender.

That

That seems to me to point clearly to the fact—because Mr. Hickson admits that he went into the question of submitting these two designs—that he had a knowledge that this plan was being made for Carter, Gummow, & Co. But let us take also the evidence of Mr. Littlejohn and of Mr. Hungerford. Mr. Littlejohn said :—

6876. *His Honor.*] As to the preparation of the Monier plan which was put in or sent in after the tenders for No. 77 were sent in—the plan which explains the lump-sum tender of £15,500—what did you hear about that in the office? I understand that you refer to the plans which were sent in with Carter, Gummow, & Co.'s tender. Mr. Baltzer told me that he was going to prepare some plans for them to send in with their tender. He used to take home his instruments every day for that purpose, and bring them back again in the morning. On one occasion, I remember that he forgot his instruments. Some time after that, I remember his bringing the plans in, and as he unrolled them I remember his saying, "I have these plans to-day, so you can look at them." He then showed me the plans.

6877. How many sheets were there? Three sheets. When I was shown the Monier plan this morning I did not altogether remember it, because I recollected seeing three sheets. I do not know whether they were all to be submitted, probably not, because the details would not be required. I know a man who was living with him at the time, and who saw him at night working upon these plans.

6878. Who is that? Mr. Hungerford.

6879. Is he the gentleman who is now in the office? Yes; he is in one of the clerical branches.

6880. Is that Mr. E. Hungerford? Yes. He was living in the same house, and he used to see Mr. Baltzer working upon these plans at night.

Mr. Hungerford's evidence was as follows :—

7533. You knew Mr. Baltzer well? Very well.

7534. Are you intimately acquainted with him? Yes, very intimately.

7535. You lodged in the same house? Yes, for some years.

7536. Before he left the department? Yes.

7537. I want to know what you knew from Mr. Baltzer as to his preparation of plans, or of a plan for use by Messrs. Carter, Gummow, & Co. in connection with their lump-sum tender for Contract 77? Mr. Baltzer was engaged for some time on those plans. I used to see him at work upon them constantly.

7538. Where was he engaged upon them? At home.

7539. Partly at home and partly in the office, or entirely at home? Entirely at home, so far as I know. I never saw him in the office, so that I cannot speak of what he did there; but we always came over from North Shore in the same boat, and I should certainly have seen him carrying plans. I presume he would not have had one plan at home and another in the office.

Then, later on, he says :—

7542. Do you know from Mr. Baltzer how he came to prepare this Monier plan? Yes; in connection with the patenting of the Monier system.

7543. Were the plans to be used with the lump-sum tender for Contract 77? He told me he was preparing them for that contract.

7544. At whose request? He never told me that.

7545. He simply said that he was preparing plans? Yes.

7546. You knew from him that these plans were going to be used in some way in relation to Contract 77? Certainly.

7547. Did you know what was going to be done in reference to them? He told me that an alternative tender was going to be put in.

7548. Did he tell you that as a secret or openly? Quite openly.

7549. Did he ask you to keep it to yourself, or what did he say? He did not ask me to do so.

7550. Was the matter generally known to any other person besides yourself? I could not say.

7551. He made no secret of it? Not to me.

Mr. Littlejohn also told the Commission that the matter was not made a secret of, and that it was known in the office; and can it be possible that, known as it was in the office, Mr. Hickson would not himself have known that such a plan was to be submitted. The suspicious circumstance upon the top of that, however, is that Mr. Hickson should not have gone into the estimate of the cost—that he should not have gone into the question whether the sureties were proper sureties or not. On the part of a man of such keen intelligence as Mr. Hickson such an omission of duty is not natural. I submit that the evidence is of such a nature as to show that there was something beyond neglect upon the part of

Mr. Hickson, and that he must have had the fullest intention, if only from the point of view of kindness to these contractors, of doing the best he could for them in this matter. If he had not had such an intention they would certainly not have had the contract under such improper conditions. I submit that the State got the worst of the contract to the extent of something like £3,200, or, at all events, a sum ranging between that amount and £4,000. Now, I hesitate about touching upon the financial stability of Messrs. Carter, Gummow, & Co., but in all contracting businesses there are ups and downs, so that you never know where a man is, unless he is a man who has a substantial backing as security in the case of accident. Now, the whole of the evidence before the Commission upon this point goes to show that Carter, Gummow, & Co. held, outside of their business, £9,000 worth of property, and that they had upon that a mortgage of more than one-half its value. Inside of their business one can see, from a glance at the bank books, that they were working on an overdraft. Mr. Parfitt, the bank manager, has said that the limit of the account of the firm was £3,000, and that if the amount went over that they must make an explanation. All this goes to show that you cannot always tell the position of contractors at a given moment. At the present moment Messrs. Carter, Gummow, & Co. may be low down. Perhaps with two or three successful contracts they may in the course of two or three years be worth £20,000 or £30,000. There is always a great hazard in contractors' businesses, and they certainly ought not to be taken as their own sureties. It must be conclusive to the mind of any business-man, that, in taking sureties in a case like this, men must be taken who have some landed property in the country upon which the State, without any bother, can put its hand, if there be any necessity to do so. Sureties are taken not so much with the object of obtaining recompense as to make contractors think very deeply before they will go insolvent, and throw the risk of loss upon their sureties. If substantial security is given by sureties they will at all times keep an eye on the contractors to see that they are not doing wrong, and in that way they may be relied upon to safeguard the interests of the country. If, on the other hand, the sureties are useless sureties, you might as well at once deliver up the whole business of competition and let the country sail along as best it can without it. Leaving Contract 77 for the time being, I will come to Contract 79. The history of Contract 79 is this: When tenders were called there was, according to Mr. Hickson's own statement, a sum of money of £170,000 upon the Estimates for the carrying out of sewerage at North Sydney. Of this amount a certain portion had been expended. There was available only a certain amount of money. A perusal of the Loan Act confirms that fact. If your Honor would like to see the Act I can put it in as evidence.

*His Honor*: A Loan Act is one of those public things which a Commissioner, like any other Court, can take cognisance of. It is a matter of such public knowledge that it is hardly necessary to make evidence of it.

*Mr. Parkes*: This sum of money being available, there was a little delay in the acceptance of the tender—a little temporary delay on the part of the Minister, Mr. Bruce Smith, until he saw how matters would turn out in the year 1892. That can be shown clearly from his own minute, holding up this contract after tenders came in for a short space of time. But there was money available, and there was no reason why this contract should not have been proceeded with in a reasonable time. Yet we have the evidence of Mr. Hudson, who, in conjunction with Mr. Bond, was the successful contractor, that the officers of the department were telling him that the work would not go on for two years. He was constantly applying to know when the work would be proceeded with. The Tender Board had the tenders for Contract 79 placed before them, and they decided to accept the lowest—that of Messrs. Bond and Hudson. But no notification was sent to the firm to that effect, nor was it made to Mr. Hudson when he repeatedly called to ask whether it was probable that the contract would shortly be proceeded with. He was never told that he might go on with his tender if he waited. There is no evidence to show that any inducement was offered to Messrs. Bond and Hudson to get them to abide by their tender, and there is full evidence that the withdrawal of their tender was only too readily accepted, without any remonstrance at all, or without any approach being made to them to see whether they would not continue, seeing that the contract was likely to be proceeded with in a few weeks time. Tenders having been called, it was found, as I said, that Bond and Hudson were the lowest tenderers. They were found to be within a shade of £30,000 below the tender of Carter & Co. Carter & Co., Gummow and Gillan, and Maddison and Ewing, were evidently at that time joined together. If they did not absolutely join together in a deed of partnership, they were joined together for the purposes of this contract. That has been proved by the books and evidence which has been adduced before this Commission, because the moneys of Carter & Co., upon this contract, were paid into the firm of Carter, Gummow, & Co., and the distribution of what profits there might be to distribute, such as to those to Mr. Maddison and to Mr. Ewing, was from the account of Carter, Gummow, & Co., although they might not actually have signed the deed until six months after the job was started. There can be no doubt that they were joint beneficiaries in the contract. They joined together in the first place to prevent Messrs. Bond and Hudson from obtaining the contract, and they wrote the joint letter of protest  
which

which appears upon page 270 of the Parliamentary return, the letter being dated the 10th June, 1891. They requested that Mr. Hickson would cancel the contract of Messrs. Bond and Hudson, because they had been the lowest tenderers upon another contract and had not taken up the job. If Mr. Hickson had done that it would have been a very peculiar thing. No one could have acceded to a request such as that; and Mr. Hickson did what it was very proper that he should do—that is, he declined to entertain the request, and recommended that Bond and Hudson's tender should be accepted. Why he did not notify Messrs. Bond and Hudson that in the near future they might expect to get the contract, I cannot tell. At all events, the delay seems to be very suspicious and in every way curious, particularly having regard to the receipt of the letter from Bond and Hudson of the 28th September, 1891, in which they say:—

*In re Contract No. 79, Sydney Sewerage Works.*

Dear Sir,

88, Sussex-street, Sydney, 28 September, 1891.

On 10th June of this year we had the pleasure of submitting a tender for the above works, and, we believe, were successful in being the lowest tenderers.

We have been anticipating the acceptance of our tender for some months, but, not hearing from your department, we have, in the meantime, entered upon other obligations, and must consequently respectfully ask you to permit us to withdraw our tender, and to return us the deposit attached thereto now lying in your hands, viz., £369.

We are, &c.,

C. B. BOND

(Bond and Hudson).

Mr. Hudson, in the course of his evidence, said—

8592. You know where the Tender Board Room is? Yes.

8593. Did you ever speak to the clerk in the Board-room? You mean Mr. Mitchell—yes. I went often down to him to get back the amount which we had put in with our tender.

8594. Did you speak to him about the contract? I could not say now.

8595. Therefore, the only intimation you had as to the acceptance or rejection of your tender was through the newspapers? Yes; I saw from the newspapers that Carter & Co. had the job.

8596. In the meantime you were under the impression that you would get the work, although it might be hung up for two years? Yes; they told me two years might elapse before it was proceeded with.

It will be seen that Mr. Hudson, up till the day he saw that Carter & Co.'s tender was accepted, was expecting to get this contract, and he gave evidence to the effect that Mr. Bond had put the sum of £2,000 into the bank as bond money for the proper carrying out of the work, showing that he was willing to carry it out. Not only that, but Mr. Hudson stated in his evidence that he anticipated making out of the contract something like £5,000. Mr. Kenwood also gave evidence upon this point:—

9024. When Mr. Carter saw you with reference to this tender of Bond and Hudson's, did he not point out to you that you were rather low in your tendering? No; the first I heard of that was through Mr. Hudson. He said that he had seen Mr. Snodgrass, and that Mr. Snodgrass had asked him what we were going to do.

9025. But you had heard that your tender was low, taking the schedule basis? No; I thought we had a fair price.

Mr. Kenwood is himself an engineer and contractor. He knows very well what prices are; he was not likely to make a mistake in coming to the conclusion that Bond and Hudson had a good price. Mr. Hudson, as I have said, thought the firm would make something like £5,000 out of the contract. Now, while this delay was taking place, Mr. Carter approached Mr. Bond, through Mr. Kenwood, and persuaded that gentleman to accept the sum of £1,500, and Mr. Kenwood, who was a son-in-law of Mr. Bond's, a sum of £200; the object being that Carter, Gummow, & Co. should, for that consideration, obtain a sum of £3,000 from the State. That, no doubt, is a fair way in which to state the position, because, looking at the way in which tenders were going, and accepting the evidence of Mr. Hudson and Mr. Kenwood, Bond and Hudson had put in a good paying tender, and Mr. Carter, in giving the £1,700 to these gentlemen to withdraw their tender, stepped in and deprived the Government of the opportunity to obtain the services of the firm for a sum of £3,000 below the price which he afterwards induced the Government to give his own firm upon their contract. Let me here draw attention to the difference between these two tenders, taking the items which were really paid for in the vouchers. In the first place I will take the item of excavation in hard rock—the item adopted for the tunnel-work done by Carter, Gummow, & Co. Messrs. Carter & Co. received 60s. upon that item, and Bond and Hudson asked for 65s. On that item only, therefore, there would have been an increase, but when we come to shaft excavation and excavation in road-surfaces it will be seen how cheap were the prices of Messrs. Bond and Hudson. In Carter & Co.'s tender the excavations in hard rock where charges of powder 4 inches in length are used—I mean item No. 7—were charged at 78s., whereas Bond and Hudson's figure would have been 35s.; for excavation in road-surfaces, Bond and Hudson put in



a price of 30s.; whereas the price put in by Carter, Gummow, & Co. was 78s. The 75 yards of road excavation given in the probable quantities was also increased, according to final voucher, to 544 cubic yards. Some of the items which Bond and Hudson sent in were highly priced, and if those prices had been adopted and the contract had been carried out upon them it would have panned out above the corresponding prices which Carter & Co. sent in. The excessive items which Bond and Hudson sent in were those which they thought would not be adopted. If they worked upon the same basis as did Carter, Gummow, & Co.—and the Department say that all contractors do work in a similar way—which I deny—they would have rigged their schedule so as to obtain an enormous sum out of the public funds. Messrs. Bond and Hudson put in the item of guttering and gadding at 80s. Of course manual labour is much more costly than is blasting out with powder, and they would not have risked putting in less than 80s., seeing that they did not know definitely that guttering and gadding would not be done. Supposing that Bond and Hudson had chosen to put in 60s. for that item, and correspondingly low prices for other items which they had known would not be carried out, their tender would then have been very low indeed. Take the other contractors. If they had known that guttering and gadding would not have been done upon this contract, they would not have put in the very high sums they did opposite that item. Some of them put in £7 for guttering and gadding work, and none of them came down to the price of Carter, Gummow, & Co., which was 63s. Your Honor will see what this kind of thing leads to—that is, allowing the contractor to obtain benefits, after his tender is accepted, by the manipulation of the schedule. Under such circumstances, a contract may start at £40,000, and may pan out at the close at £40,000, although there have been certain items eliminated and a certain number of other items increased. Notwithstanding that the initial and the closing sum may be both £40,000, the contractor will have received considerable benefit upon the extra items put in and upon the items eliminated. There can be no doubt that if Bond and Hudson's tender had been accepted it would have been greatly to the advantage of the State, and that Carter, Gummow, & Co., in interfering with the right of the State to receive the benefit of the services of those tenderers, put the Government to a loss of something like £6,000, made up by the difference between Carter, Gummow, & Co.'s tender and Bond and Hudson's tender—the difference between the items which would have been finally adopted, as shown by the final certificate. What is to be thought of action of that kind I do not know, if it is not to be strongly condemned. If in private practice or employment there had been such laxity, to put it mildly, in the carrying on of business, interfering with the interests of the constituents of a firm, and causing such a loss as that which I have indicated in this instance—causing an interference, for instance, with the right of the firm to obtain competitive valuations—I do not know what would have taken place. I am not acquainted with the law on the subject, and I do not know how this matter stands legally. I would not submit to your Honor that this interference with the right of the State to obtain the services of Bond and Hudson is actually punishable by law; all I want to make clear is that it was a highly improper thing to occur in connection with a Government contract—that it is a thing which ought not to be permitted. I intend presently to bring further proof to show that there is grave reason for doubting whether these circumstances were not thoroughly known to the Engineer-in-Chief; I intend to show that the very acts of the Engineer-in-Chief assisted this kind of business. It is naturally very difficult to obtain strong proof of the firm's having been assisted by him; I should be just as pleased if no strong proof could be brought, but at the same time I should like to see an end put to any transactions like this—to prevent the recurrence of any such thing. It could be easily stopped by having some definite method of tendering. For instance, if a contractor who, in open competition, is £3,000 over the lowest tenderer, is not allowed to have the next place if the lowest tenderer withdraws, that would at once put an end to all collusion in connection with these matters. I would like to draw attention to Mr. Barling's opinion of this transaction. He gave this evidence:—

13908. *Mr. Parkes.*] Would it not have been a fair thing to re-tender this contract when there was a difference of nearly £3,000 between Bond and Hudson and the next tenderer? I submitted it for fresh tenders to be called, and approved of that's being done; and it was only when these other considerations, with which I had nothing to do, came in that another course was taken.

That referred to Mr. Hickson's interference with the course of tendering on the very last day before tenders were to be re-advertised, and when he induced Mr. Lyne to give this contract to Messrs. Carter & Co. Mr. Barling gave this further evidence—

13898. But I presume you would not have agreed to Messrs. Carter & Co.'s having this contract without tender had you known that Bond and Hudson were willing to take it up? Certainly not. Most certainly not—it would have been a wrong thing to do.

13899. If you had known at that time that Bond and Hudson had been bought off by Messrs. Carter, Gummow, & Co., would you have accepted Messrs. Carter, Gummow, & Co.'s tender? I should say most certainly not.

I come now to the manner in which Carter & Co., after this transaction, managed to get this contract given to them instead of having it re-tendered. I will point out this suspicious circumstance about it. Would it be natural for Messrs. Gummow, Gillan, & Co., if they were not associated in this contract, seeing how close their tender was to that of Carter & Co., to join with them in making the first protest. What would they have gained by protesting against Messrs. Bond and Hudson's receiving the contract if it were not to be re-tendered? How did Carter & Co. go about the obtaining of this contract? They approached Mr. Hickson seven days before he wrote the minute which I will read to Your Honor, and which appears on page 271 of the Parliamentary return. After Messrs. Bond and Hudson had, on the 28th September, withdrawn their tender—as Mr. Hudson has explained, not with his knowledge—Mr. Barling instructed Mr. Hickson to have fresh tenders called. Mr. Hickson noted that in a minute, and then Carter & Co., about seven days before Mr. Hickson took the second action, came to him with a certain claim, a claim for the stoppage of a former contract. Mr. Hickson then wrote this minute on the very day the tenders were to be received,—

Since writing my minute of 6/10/91, complications have arisen with Carter & Co., *re* their contract No. 72 having been stopped. They have made large claims on this account, some of which, no doubt, could not be entertained, but on some items they have made a good case. They are prepared, if they obtained this work, to waive all claims on No. 72. As their tender is a reasonable one, and some £3,600 below the estimate, I think it might fairly be accepted. If this course were adopted, work would be given at once to a large number of men.—R.H., 23/2/92. Under Secretary. Important. I would draw your Honor's attention to the last passage which occurs in that minute. We find the same thing occurring in connection with 79A, where the Minister let the contract without competition, because, as it seemed, it would give employment to a large number of men. There are not a great number of men employed upon these sewerage contracts, and it is simply absurd to make the number of men who would be employed an excuse for giving the contract. The claim submitted by Messrs. Carter & Co. appears in Mr. Christie's evidence upon page 256, and is as follows:—

Carter & Co.'s claim in *re* Contract No. 72.—Losses by Withdrawal of Contract Work.

|  |                   | Rate. | £     | s. | d. |   |
|--|-------------------|-------|-------|----|----|---|
| Rent of Knight's paddock .....                           | 40 weeks ...      | 5/-   | 10    | 0  | 0  | Required for storage purposes, Macdonald-street.                          |
| Sandstone for concrete broken and stacked.....           | 1,000 c. yds. ... | 8/-   | 400   | 0  | 0  | Material purchased before withdrawal of work.                             |
| Portland cement.....                                     | 1,300 casks ...   | 14/9  | 958   | 15 | 0  | do do   |
| Do loss on sale .....                                    | 2,000 „ ...       | 2/6   | 250   | 0  | 0  | do do   |
| Gratings .....   | 25 .....          | 70/-  | 87    | 10 | 0  | do do   |
| Man-hole covers .....                                    | 4 .....           | 150/- | 30    | 0  | 0  | do do   |
| Interest on expenditure, £3,211 5s. ...                  | 3 months... ..    | 8 %   | 64    | 4  | 6  | do do   |
| Valuation of plant on ground for completion of contract. | .....             | ..... | 500   | 0  | 0  | Cost of cement sold is included in £3,211 5s.                             |
| Loss of profit on work withdrawn ...                     | £7,000 .....      | 25 %  | 1,750 | 0  | 0  | The greatest profit would have accrued from this portion of the contract. |
|  |                   |       | 4,050 | 9  | 6  |   |

It has been very clearly proved in evidence, and also from the papers which have been placed before the Commission, that, after the notice by Mr. Hickson that the works would not be continued beyond a certain point—I refer to the notice of October, 1891—work upon this contract was still going on and was being paid for, according to vouchers which have been placed before your Honor. The Portland cement referred to in the claim was being used extensively in the carrying out of the work, and, as a matter of fact, there was neither cessation nor was there any hindrance in the onward conduct of the contract. Although the notice to which I have referred was given in October, the works were not stopped, and in April when the new Loan Bill of that year was passed, containing the required sum of money—it being known by the Department and the contractors that it would be so passed—the work was at once continued. What is there, in that claim, which any reasonable man knowing the circumstances as Mr. Hickson knew them, could consider fairly chargeable against the department. Let me take the items “Sandstone for concrete broken and stacked,”—that was used. The cement was also used; the manhole covers were used. The interest on the expenditure was not as represented. The valuation of plant for the completion of the contract ought not to have been in the claim because the plant was not only used there, but was taken to other contracts. As to the loss of profit on work withdrawn, there was no work withdrawn; the contract was continued. There was never any intention, I submit, to withdraw the work, as both Mr. Hickson and the contractors well knew. I cannot see any item in that claim in regard to which any man wishing to conserve the interests of the public can allow that the slightest legal or equitable right exists. At all events, that was the claim made. Mr. Christie in his evidence, upon page 256, in connection with this matter, says:—

(l) Messrs. Carter & Co.'s claim is dated 15 February, 1892, and was marked by Mr. Hickson to Mr. Bagge for report on 18th February, 1892. Mr. Bagge sent it to Mr. Davis for report on 22nd February, 1892, Mr. Davis returned the papers on 26th February, 1892, with the following minute:—

“This matter has now been settled. I understand the contractors have signed the office measurements, accepting them.” It

It would thus appear that on 22nd February, 1892 (when Mr. Hickson advised the Minister that he thought Messrs. Carter & Co. could make good a claim for something like £2,000 as compensation on Contract 72), the documents were not with Mr. Hickson, and the claim had not been looked into or reported on, nor has it at any subsequent date so been dealt with.

- (m) It has been stated in evidence before the Commission that Mr. Bond, without Mr. Hudson's knowledge, withdrew the tender of Bond and Hudson; that Mr. Bond received £750 for so doing, and that Mr. Kenwood (Mr. Bond's son-in-law) was paid £200 for negotiating the matter.

There is no doubt that Mr. Christie, looking through the dates and other particulars and comparing one fact with another, has there pointed out to your Honor conclusive evidence that Mr. Hickson had not perused this document setting forth the claim of the contractors, or that he had even waited for it to be reported upon, before he interviewed the Minister. It was upon the very last day for re-tendering upon which Mr. Hickson approached the Minister, and he then hurriedly wrote minutes granting this concession of another contract to the contractors, Messrs. Carter, Gummow, & Co., who were notified accordingly. Of course, as your Honor will see, within a very short period—almost on the same day, I think—a congratulatory letter which appears in the Parliamentary papers was written from the Mayor of North Sydney referring to the letting of this contract. The date of accepting this contract, not of signing it, must have been conveyed to the Mayor, Mr. Punch, very quickly, seeing that on the 23rd this undertaking was accepted, and that on the 24th he wrote the following:—

Dear Mr. Lyne,

24 February, 1892.

Permit me to thank you for the prompt manner you have settled the North Sydney sewerage contract. I am sure the people in the district will join with me in praise of you for the consideration you have given them on all occasions when your assistance has been asked for the carrying out of public works. Long may you continue in your present place, for I feel sure the country will progress with such men as you at the head of affairs.

Again thanking you, I am, dear Mr. Lyne,—

Yours, &c.,  
F. PUNCH.

It was very close upon that date that Mr. Punch received the news. All these things seem to have been done in a wonderful hurry, and that of itself gives rise to suspicion.

*Mr. Smith*: Might I point out that tenders were not called for until the 9th March.

*His Honor*: Tenders were called for a future time. It is the closing of the tendering I understand to which Mr. Parkes alludes.

*Mr. Parkes*: Mr. Hickson, on the 23rd February, wrote his minute, and Mr. Punch wrote his letter on the following day.

*Mr. Smith*: Tenders had been called for that date, but the notice was afterwards withdrawn.

*Mr. Parkes*: Although Mr. Barling said that tenders were to be called for they were not called for. The matter was hung up until the date when Mr. Hickson interfered by seeing the Minister and putting this claim before him.

*His Honor*: The notice appears to have been sent to the *Gazette*, and to have been withdrawn before the advertisement appeared.

*Mr. Parkes*: Allow me to direct your Honor's attention to Mr. Barling's evidence upon this point. He said that, knowing that Messrs. Bond and Hudson had withdrawn their tender, he gave instructions that fresh tenders should be called, but that fresh tenders were not called, and the whole thing was hung up until Mr. Lyne came into office, the matter being only submitted to and approved by him on the 22nd February, the matter having been delayed from the time Mr. Barling instructed that fresh tenders should be called—that is, after the 28th September, 1891, until the 22nd February, 1892. No action was taken in this interval, and then Mr. Lyne suddenly approved of the calling for tenders. No sooner had he done so than, on 23rd February, Mr. Hickson interfered and stopped it. At this stage I would ask your Honor to direct the production to the Commission of the journal Contract 72. It is a most important journal, and it is absolutely essential that we should have it.

*His Honor*: Mr. Hungerford, I understood, has instituted an unsuccessful search for that and other papers, but I will ask Mr. Davis to instruct Mr. Hungerford to make a particular search for this journal. It is as important in one sense as is the original plan of the same contract.

*Mr. Parkes*: The claim which it has been stated in evidence was put in by and made up by Mr. B. C. Simpson is undoubtedly in Mr. Carter's own handwriting.

*His Honor*: What is the date?

*Mr. Parkes*: The date is the 15th February.

*His Honor*: Is it admitted to be in Mr. Carter's handwriting?

*Mr. Carter*: Yes, your Honor.

*Mr.*

*Mr. Davis* : I think your Honor will find that the subject matter of Mr. Carter's letter was before the department long before that date.

*His Honor* : I think it must be so. It appears from the terms of the paper itself that there must have been something before that date. I suppose these are the whole of the papers which the department have been able to discover dealing with the question.

*Mr. Davis* : I think Mr. B. C. Simpson's letters have been put in in evidence. They bear directly upon this very question. As a matter of fact Mr. Carter's letter does not do so.

*Mr. Christie* : It is the first record of any specific claim.

*His Honor* : That is, of any claim put in in a tabulated form.

*Mr. Christie* : Yes.

*Mr. Davis* : I think Mr. Simpson mentions the amount in one of his letters, but I am not sure about it.

*His Honor* : There is a letter of Mr. B. C. Simpson's, dated 10th December, referring to something which transpired earlier. Correspondence had apparently been going on sometime before.

*Mr. Parkes* : I would suggest that, in cases where I produce documentary evidence, I ought to be answered by documentary evidence. I have consistently produced throughout the proceedings of the Commission documentary evidence of this nature, and I think it ought to be answered by documentary evidence. I think the department ought to produce documents showing that the claim was submitted before the statement of claim which I have put in.

*His Honor* : Some of the original papers have been already put in.

*Mr. Parkes* : But none containing the details.

*His Honor* : What Mr. Smith, I understand, is objecting to is the statement that the letter of Mr. Carter, to which you were referring, was the first appearance of a claim.

*Mr. Parkes* : It is the first appearance of the items of the claim.

*His Honor* : Apparently it is. At all events it is the first that has been found. Mr. Christie's statement is accurate in that respect. What Mr. Christie states is, that it appeared at that time in a definite form, not that it then appeared for the first time.

His Honor at 1.5 p.m. adjourned the inquiry until 10 a.m. on Thursday, 8th October, 1896.

C. E. R. MURRAY,  
Commissioner.

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THURSDAY, 8 OCTOBER, 1896.

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising); attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, Bond Clerk, attended.

Edward Hungerford was recalled and further examined.

James Watson Fraser and Michael McMahon were sworn and examined.

*His Honor* : I will now call upon Mr. Parkes to resume his address.

*Mr. Parkes* : When the Commission adjourned yesterday I was referring to the claim made by Carter & Co. with reference to Contract 72, and upon which Mr. Hickson obtained the consent of Mr. Lyne to the granting to the firm of Contract 79, the firm's tender price for the contract being £3,000 above the tender price of the lowest tenderers, Messrs. Bond and Hudson. Now, the peculiarity of the circumstances is this, that before this Commission sat the whole of this matter was talked of, not as a claim for suspension, but as a claim for the withdrawal of a portion of the contract. I wish to impress upon your Honor that the question of suspension has come forward only since this and other matters have been referred to this Commission for inquiry. Mr. Carter, in the statement of claim which is attached to his letter of the 15th February, 1892, says, "Loss by withdrawal of contract work." You will see he does not say "suspension"; he says "withdrawal." Now, Mr. Hickson, as will be seen upon page 271 of the Parliamentary return, in referring the matter to Mr. Lyne, says:—

Since writing my minute of 6/10/91 complications have arisen with Carter & Co. *re* their Contract 72 having been stopped.

As a matter of fact he does not use the word "suspended"; but if you refer to Mr. Hickson's letters, written months before, to Mr. Lyne, to the contractors, and, through Mr. Barling, to certain municipal authorities,

authorities, you will find that he refers to the work as being only suspended. I still maintain, therefore, that Mr. Christie's evidence, which I laid before your Honor yesterday, is absolutely correct—that is, that Mr. Hickson, when he recommended to Mr. Lyne the acceptance of Carter & Co.'s tender for Contract 79, had never seen this claim. Mr. Simpson, as is evidenced by his letter, which is among the appendices, was going on the basis absolutely that there was a withdrawal of a portion of the contract, until we come to a period when he seems to have had an interview with Mr. Hickson. He appears to have been told that the work was to be gone on with, because in his final letter of 10th December, 1891, he asks that the suspension should be quickly settled and the continuation of the contract entered upon. In his first letter he says:—

Messrs. Carter & Co. have again seen me respecting their claims for compensation on account of the withdrawal of the most profitable portion of their Sewerage Contract No. 72, concerning which claim I wrote to you on the 19th October. Mr. Piper, of your department, called on me on the 3rd ultimo, and stated that you agreed with him as to the contractors' right to complete their contract; but, pending their completion, Messrs. Carter & Co. allege that they are being put to continued expense, and desire that a settlement of the question should be arrived at.

That is the settlement of the question—that they are to go on with their contract.

They appear to want only what is fair, which, I am quite sure, you will be willing to give them; and I shall be pleased if I can assist in a satisfactory settlement. I shall be glad to call upon you at any time that will be convenient to you.

Mr. Hickson made a minute upon this paper, asking for an interview, and that interview must have taken place. This claim could not by anyone who understands ordinary business be entertained if there was a continuation of the contract in contemplation, and it is very clear that there was. It is clear that this intention was conveyed to Carter & Co., and also to Mr. Simpson. We will take the items of the claim *seriatim*:—"Rent of Knight's paddock, 40 weeks, £10." That might be allowed. Then there is "Sandstone for concrete, broken and stacked, £400." That certainly would be used, and was actually being used, because, as I have pointed out from the evidence—and it cannot be denied—this work was actually going on, and certificates were being paid in respect of it up to February. Then there was also the request for a return of the retention money which set forth the amount of the work then done, the end of the section being reached. As regards the next item, "Portland cement, 1,300 casks at 14s. 9d.—£958 15s.," that must have been used even before this claim was entered upon. Then there is, "Portland cement, loss on sale, 2,000 casks at 2s. 6d.—£250." That is a loss which certainly did not occur unless the cement was resold afterwards, of which we have not had any evidence. Undoubtedly it is not an item which can be taken into consideration in connection with the question of suspension, when there was a large portion of the contract—something like £8,000 worth—to be continued at a later date. The next item is, "Gratings, 75 at 70s.—£87 10s." There is a letter among the documents which have been put before your Honor showing that they were bought by the department. The next item is, "Manhole covers, 4 at 150s.—£30." Those were all used. The next items are, "Interest on expenditure, £3,211 5s.—three months at 8 per cent., £64 4s. 6d.; valuation of plant on ground for completion of contract, £500." The plant was used in the completion of the contract. Then the last item is, "Loss of profit on the work withdrawn, £7,000 at 25 per cent.—£1,750." We know that the work was afterwards continued, and whatever profit there may have been upon it was obtained by the contractors, not lost by them. I desire to point out to your Honor the remarkable nature of this Contract 72, because it is evident that it was started, first of all, upon a certain plan. That plan was to continue it from a certain junction at Macdonaldtown Park to Shea's Creek. There was a clause in the contract put in for a very proper and obvious reason. That clause is quoted in Mr. Davis's evidence, upon page 519:—

It is to be understood that the lower 13 or 27 chains of the channel shall not be constructed until the engineer gives a written order to that effect; and the engineer shall have the power to suspend the execution of these portions of the work, or any other part of the contract, or to reduce the length of the contract by the extent of the said 13 or 27 chains, or any other part of the sewer shown on the drawings, that he may consider necessary, and the contract shall not thereby be invalidated, nor shall the contractor be entitled to any compensation on account of such temporary suspension of any part or parts of the contract or permanent reduction of same.

That clause is a definite clause put into the specification;—and for what reason? The reason adduced is, that the Government had a certain sum of money from which alone this work could be constructed. If the whole of the work were constructed the Loan Vote would be exceeded. It was reduced in this way for the purpose of keeping it within the Loan Vote, and also for another purpose—to prevent the work from going on to the Public Works Committee, which, in the first place, was a very wrong thing for the department to have done, because it was a deliberate interference with an Act of Parliament enacted for

for the control of this very department in its expenditure. If your Honor will turn to the specification of Contract 72 you will see the proper description of the work which Carter, Gummow, & Co. had to carry out under their schedule. You will see the extent of the contract to be performed at that time.

The works comprised in this contract consist in the necessary excavation, shoring, timbering, piling, unwatering, concrete, brickwork, stonework, rendering, re-filling, pipe-laying, carpenter's work, ironwork, pitching, paving, ballasting, metalling, leading surplus materials to spoil, &c., required in the construction of the following, viz. :—

|                      |                  |   |                                 |
|----------------------|------------------|---|---------------------------------|
| From Shea's Creek to | 20 chains        | open channel  | 11 ft. 6 in. x 7 ft. 6 in.      |
| „                    | 20 chains to 28  | „ oval sewer  | 10 ft. 6 in. x 6 ft. 6 in.      |
| „                    | 28 „ to 39·12    | „ „   | 10 ft. 6 in. x 6 ft.            |
| „                    | 39·12 „ to 39·77 | „ junction of two creeks, with flat concrete decking between wrought-iron rolled girders. |                                 |
| „                    | 39·70 „ to 48·17 | „ oval sewer  | 7 ft. 2 in. x 6 ft.             |
| „                    | 48·17 „ to 58    | „ circular sewer of   | 6 ft. internal diameter.        |
| „                    | 58 „ to 62·50    | „ „ of  | 5 ft. 10 in. internal diameter. |
| „                    | 62·50 „ to 66    | „ „ of  | 5 ft. 2 in. internal diameter.  |
| „                    | 66 „ to 72       | „ „ of  | 3 ft. internal diameter.        |
| „                    | 72 „ to 76·58    | „ „ of  | 2 ft. 6 in. internal diameter.  |

in open cutting in mud, sand, loam, clay, shale, and ironstone, as shown on longitudinal section, and as shall be directed, with all branches, junctions, curves, manholes, flushing chambers, subducts, road-making, and all other works in connection with those herein enumerated, and the maintenance of the whole of the works for a period of three months after they have been formally taken over by the engineer.

That defines the extent of the contract absolutely. There can be no doubt that to say that any other work which was afterwards put in was not extra work is only a quibble. I will proceed to show, from Mr. Davis' evidence, how this contention is borne out. Let me, first of all, quote a minute by Mr. Hickson, which appears upon page 514 of the printed evidence, which is dated the 5th February, 1892. Mr. Hickson says :—

This tender was accepted on the understanding that the cost of the work be reduced so as to bring the cost within the amount allowed without reference to the Public Works Committee.

That, I submit, was a very wrong action for Mr. Hickson to take. The Public Works Act, establishing the Committee, did not contemplate any infringement of that sort.

*His Honor* : I quite agree with you, Mr. Parkes, but it has been often done in other cases. It does not come very much within the question before the Commission, of course.

*Mr. Parkes* : Still, it shows a reason for the reduction of this work. Mr. Hickson's minute continues :—

At the commencement of the contract the sum of £15,500 was available, and this was proposed to be expended on the work between the Mitchell Road and Munni-street (C to E on sketch), a clause allowing a reduction of the work, A to C, being inserted in the specification.

On starting the work, however, it was found that there was no outlet to the sewer at Mitchell Road at C, and a channel had to be cut along the proposed course of Shea's Creek Canal (A to B), at a cost of £4,000, to provide an outlet, and the sewer continued from Mitchell Road (C) to the commencement of the outlet channel (B), at a cost of £8,000.

This unavoidable construction of the sewer in the first instance, from A to D, exhausted the funds, and that portion of the work from the Macdonaldtown Park junction at D to the point of commencement at Munni-street (E), which formed part of the original contract, has had to be omitted for the present.

That, as I say, was written on 5th February, 1892, yet Mr. Hickson on 23rd February, 1892, writes to the Minister as follows :—

Since writing my minute of 6/10/91 complications have arisen with Carter & Co. *re* their contract No. 72 having been stopped.

Going a stage further in the matter, we find Mr. Davis' own minute of 3rd October, 1891 :—

The amount of tender for Contract No. 72 was £20,650, but it was accepted conditionally upon the contract's being reduced by £3,000.

It is advisable that Contract No. 72 should be continued so as to give an outlet to Contract No. 75.

|  |              |
|--|--------------|
| The cost of doing this will be .....           | £18,764 4 10 |
| Deduct amount paid to date .....               | 9,680 13 9   |
| Amount required to finish to Contract 75 ..... | 9,087 11 1   |
| Amount available from vote .....               | 5,754 0 0    |
| Balance to be provided .....                   | £3,333 11 1  |

I beg to suggest that this amount be paid from the following votes, viz. :—

|   |            |
|---|------------|
| (1.) There will probably be a balance of £2,000 from the Macdonaldtown Storm-water Channel Vote, after that channel has been paid for, which might be used for Contract No. 72, which is part and parcel of the same work ..... | £2,000 0 0 |
| (2.) The following amounts, being balances left from votes from the undermentioned storm-water channels, might also be used for this purpose :—   |            |
| University, storm-water channel .....   | 131 0 0    |
| Phillip-street, Alexandria, storm-water channel.....  | 815 0 0    |
| Pymont Bridge Road, storm-water channel .....   | 265 0 0    |
| Alexandria Park, storm-water channel.....   | 57 0 0     |
|   | £3,268 0 0 |

Mr. Bagge.

J. DAVIS.

That shows what an easy conscience Mr. Davis has in shifting about these votes. He would have returned this money as having been expended upon the University storm-water channel, the storm-water channel at Phillip-street, Alexandria, the storm-water channel at Pymont Bridge Road, and the storm-water channel at Alexandria Park, it having been expended upon Contract No. 72. All this goes to clearly prove that this contract had a certain limit and that a certain amount of extra work, an extension of the work, was afterwards decided upon—that as a matter of fact the claim which Carter, Gummow, & Co. put in was for an amount of work which was a contemplated reduction when they signed their contract. That circumstance the contractors themselves, as well as the department, must have known. This amount of extra work which was added to the contract to carry out the canal should, at least, have been taken into consideration. Upon page 516 of the evidence you will also see a minute by Mr. Barling, under date of 28th October, 1891, in which he says :—

On the Loan Estimates for 1890 the following votes were taken :—

Macdonaldtown Park Storm-water Sewer, from Swanson-street to Ashmore-street; thence from Ashmore-street to Macdonald-street—£8,500.

Storm-water Channel from Munni-street, Newtown, through Macdonaldtown Park to Shea's Creek—£15,500.

The work comprised in the first item is shown on the accompanying plan marked "A" to "B." It is being carried out by Messrs. Parry and Farley, and is nearly completed. The cost will be about £6,500, leaving a balance on the vote of about £2,000.

The work comprised in the second item is now being carried out by Carter & Co. Its position is shown on plan starting from point "C," and it is intended to terminate at "E," supposing sufficient funds are at disposal for the purpose, the contract being a schedule one. It was found during the progress of this work that an earthen drain was required from point "C" to "F" on plan, running along the course of Shea's Creek Canal. This work was one which it was first understood would be carried out by the Harbours and Rivers Branch in connection with the canal works, but it was subsequently decided to include the work in the Roads Branch Contract. This earthen drain will absorb £4,000 of the money, leaving a deficiency on the vote of something like £9,000. The contract of Messrs. Parry and Farley has been shown as terminating at point "B" on plan, and a small gap has been left between "B" and "D," which it is estimated will cost £1,264 to complete. This can be paid for out of the balance available on the £8,500 vote. It will be seen, therefore, that a further sum of £9,000 will be required to complete the whole of the work from "E" to "F." Of this sum, £4,000 is required on account of the earthen drain referred to, and which was not contemplated when the work was undertaken, and the balance, £5,000, is required to complete the work up to "E." In other words, the £9,000 represents "extras," not contemplated when the contract was let.

It is represented that the matter is so urgent that the Minister is asked whether special arrangements cannot be made to permit of this work being proceeded with, in anticipation of further funds being voted. None of the additional sum will be required until next year. This further amount will bring the cost of the Munni-street sewer to about £25,000.

J.B.

Can there be any doubt whatever, in the face of that minute, and the plan indicating so clearly the contract, that the work originally contemplated was from "C" to "E," and that after the work had started the piece of canal which runs across the site of the proposed ship-canal, under the Harbours and Rivers Department, that is, from "C" to "F," was an extra given to the contractors. If the question is to be looked at from the point of view of equity, let me point out at what cost this work was given to the contractors. Your Honor saw the site, and must have noticed the nature of the material which had to be excavated. Although the canal itself, which runs from "D" to "C," was only 12 feet across, this further canal,—this extension of the earthwork, as shown upon the tracing which has been placed before the Commission,—is about 21 feet at the bottom and about 50 feet at the top.

*Mr. Davis:* Those are not the correct dimensions. The evidence goes to show that the size required to discharge the quantity of water which would come down a concrete canal was provided in the earth canal.

*His Honor:* As far as I can see, Mr. Parkes is rather overstating than understating the size of the channel. I could quite understand your objection, Mr. Davis, had the opposite been the case. I do not know whether Mr. Parkes intends to contend that the size of the channel was unnecessarily large.

*Mr. Parkes:* Yes, your Honor.

*Mr. Davis:* As I have already said, the size was that required to discharge the quantity of water which came down the concrete channel.

*His*



*His Honor* : It goes without saying that the earth channel would have to be larger than would a concrete channel, but it is a question of engineering whether it was or was not unduly large.

*Mr. Parkes* : The original storm-water channel, as far as can be judged from the plans, is about 9 feet deep, but the extra earth canal is only about 5 feet 6 inches deep, but the channel is spread out to a very great extent. The quantity which it contained was about 22,000 cubic yards, and that was paid for at the rate of 2s. 6d. for excavation, and 1s. for the placing of the spoil 25 feet away from the margin of the channel, as will be seen by the two letters which I will now read to your Honor. On the 13th March, 1891, Mr. Tillett, of the Harbours and Rivers branch, wrote the following minute:—

It has just come to my knowledge that in carrying out the works of the Munni-street to Shea's Creek Sewer, a part of which is along the centre line of the proposed Shea's Creek Canal, and is itself an open channel, the material from the open channel is being disposed in such a position as in the event of the Shea's Creek Canal being extended to Buckland the whole of their material will have again to be moved: it may be possible that this material can be so disposed as to make one moving sufficient. I would suggest that the Engineer-in-Chief for Roads and Bridges' attention be drawn to the matter.

On the following page your Honor will find a minute by Mr. Davis containing the following:—

The ground is of such soft nature that I do not think it practicable to move our excavated material clear of the 750 feet proposed canal resumption, except at great expense, and as it does not appear that the cross section of the excavation for the canal is definitely settled, I recommend that our contractors be allowed to go on depositing the earth parallel with the canal, leaving 25 feet from the edge of the canal for the future bank.

It will be seen that afterwards, when the Harbours and Rivers Department came to deal with the matter, they had to shift this material. Now the payment of this price of 3s. 6d. for the excavation of this canal, and the deposit of the spoil 25 feet from the margin—

*Mr. Davis* : The evidence is not that 3s. 6d. was paid.

*His Honor* : 2s. 6d. appears to have been paid for the excavation, and 1s. for depositing the spoil?

*Mr. Davis* : Yes, your Honor, and the evidence is that the 1s. was not paid.

*Mr. Parkes* : If your Honor will take out the area of the canal you will find that it comes to 22,000 yards. Those 22,000 yards, if paid for at the rate of 2s. 6d. per yard for excavation, will not make £4,000, the sum of money which was put down as being the amount of money required for this work. It is very easy to be seen that the extra shilling was required to make up the £4,000, the sum of money which was paid for the canal. It is simply a quibble to interrupt my address with matters of this sort. I think that unless I am stating that which is not a fact I ought not to be interrupted.

*His Honor* : The question to which Mr. Davis is alluding is, I take it, 15790 and the following questions in his own evidence:—

15790. Did the contractors receive 1s. a yard for filling—for putting the spoil 25 yards from the bank? No.

15791. What became of the spoil of the canal? It was put as the minute I have just read—the minute of the 16th March—indicates.

15792. Where was it put? As that minute indicates.

15793. What does the minute say? I think 25 ft. from the edge of the proposed canal.

15794. And did the Harbours and Rivers Branch remove it again? I do not know what happened afterwards.

15795. The Harbours and Rivers Branch excavated the ground where it was deposited? I do not think so. I believe after we had drained the swamp a period elapsed before the ships' canal was brought up to that point. I suppose a couple of years elapsed. The swamp being drained, Chinamen started to cultivate upon the soil we had put there; in fact, they had some nice gardens there, and it was not until the ship canal was put into operation that the gardens were abandoned.

15796. Do you call that the losing end of a contract where the contractors were receiving 2s. 6d. for excavating soft material, and where they deposited it at 1s. a yard? It was a very nasty end of the contract.

There is no contradiction to your assumption, Mr. Parkes, that 1s. a yard was paid for depositing. The final voucher would show that.

*Mr. Parkes* : If your Honor will look at page 139 of the Parliamentary Return your Honor will see the original contract. The probable quantity of excavation is set down at 26,200 yards, at 2s. 6d.

*His Honor* : The final certificate shows the general excavation at 53,410 yards, at 2s. 6d., and the filling in at 27,961 yards, at 1s., corresponding with the amount originally contemplated. *Mr.*

*Mr. Parkes* : Your Honor will see that the quantity of filling given in the schedule on page 139 of the Parliamentary Return is only 12,000 yards. In the minute of Mr. Barling, to which I have already referred, you will find these words :—

It will be seen, therefore, that a further sum of £9,000 will be required to complete the whole of the work from "E" to "F." Of this sum £4,000 is required on account of the earthen drain referred to.

If you take the 22,000 yards at 3s. 6d., you will find that it will make up the £4,000. I say that if the Engineer-in-Chief recommended that in respect of this simple notice of an intention to suspend the work at a certain point—the work was really not suspended but went on continuously—a claim existed upon grounds of an equitable nature, surely the interests of the country ought to have been taken into consideration, when the contractors were given a piece of canaling at a cost of 3s. 6d. per cubic yard. It is not so long ago when the Contractor's Association waited upon the present Secretary for Public Works, Mr. Young, and undertook to take out as much of this class of excavation as was required, and to deposit it wherever the Minister wished, at 7d. per yard. That is an excellent price for such a class of excavation, as any professional man will tell your Honor.

*His Honor* : When did that occur ?

*Mr. Parkes* : About two months ago.

*Mr. Davis* : It was a totally different case. The material was different.

*Mr. Carter* : I think Mr Parkes is referring to sand.

*Mr. Davis* : There is absolutely no parallel between the two cases.

*His Honor* : The circumstance to which Mr. Parkes refers is not in evidence ; and I do not, in fact, know of my own knowledge whether anything of the kind occurred. If anything of the kind occurred which could be made material to this inquiry, I should take evidence in reference to it if it were produced. That which occurred very lately it would be hardly fair, however, to compare with what occurred in 1891.

*Mr. Parkes* : Will your Honor allow me to put in the evidence ?

*His Honor* : Yes.

*Mr. Parkes* : Then I will do so at a later stage.

*His Honor* : Of course I shall also allow evidence to be tendered in reply.

*Mr. Parkes* : But putting that question aside for the time being, the cost of this excavation is equal, as a matter of fact, to the cost put in many contracts, which have been laid before your Honor, for the blasting out of solid rock, viz., 4s. Take, for instance, Carter & Co.'s own schedule for Contract 69. They have put in items there which they certainly were not asked to carry out.

*His Honor* : No one says that those are the proper values. The contractors themselves do not contend that they are proper values.

*Mr. Parkes* : But the department has, in some of these cases, put in blasting at a very small price, viz., 6s. a yard. If this extra work were required, it must have been known before the contract was started that the contractors would have to do it ; and that, without the slightest doubt, was the object of the clause in the contract which was referred to in Mr. Hickson's letter giving power to the Engineer-in-Chief to suspend or to alter or cut off a portion of the contract wherever it might happen to be at the time. This clause gave the department absolute power and left the contractors without the slightest right to compensation.

*His Honor* : I see that in the schedule for Contract 118 excavation in hard rock with 4-inch charges is put down at 6s. 6d., whereas excavation in surfacé soil, mud, sand, clay, ballast, and soft rock, is put down at 2s.

*Mr. Parkes* : The schedules in various contracts show very small prices for rock excavation, but there can be no doubt that 3s. 6d. per yard was an enormous price for the excavation in the case of Contract 72. Mr. Hickson's communication to the contractors in respect to the suspension of the contract was in these terms :—

With reference to your contract, No. 72, Sydney Sewerage Works, Munni-street, Shea's Creek, south-west channel, I have the honor to inform you that, in accordance with clause No. 3 of the specification, which gives me power to make such permanent alterations as may be considered necessary, I have decided to terminate the contract after the construction of the junction chamber and connection with the Macdonaldtown Park storm-water channel at 41.30 chains, thereby omitting that portion of the contract from such junction upwards to the point of termination of the sewer, as shown on drawings at Union-street, and hereby give you notice that the Munni-street storm-water channel is not to be carried on beyond the before-mentioned junction.

The

The explanation of that letter in the evidence is this—that it was sent by Mr. Hickson to the contractors merely as a bluff. I do not think your Honor can possibly accept that explanation as seriously given. Here we have the business letter of a man who has made provision in his specification guarding against his getting into difficulties by running beyond the money available or allotted for the contract. He knew that under this clause he could alter the contract as he liked. As a matter of fact the contract was started and carried out in such an unbusinesslike fashion, and in such a confused way, that Mr. Hickson, no doubt, saw that he would get into difficulties unless he took this step—unless he availed himself of the clause which he had specially provided in the specification. No valid claim for compensation therefor could have arisen from the exercise of power under that clause. What does Mr. Hickson himself say in his own letter of 5th February, 1892:—

At the commencement of the contract the sum of £15,500 was available, and this was proposed to be expended on the work between the Mitchell Road and Munni-street, C to E on sketch, a clause allowing a reduction of the work, A to C, being inserted in the specification.

Mr. Hickson must have known that the stoppage was only of a temporary nature. He could not, as a matter of fact, have known the items which were put into the contractors' claim. Coming to those items, is it a reasonable thing to suppose that a shrewd man like Mr. B. C. Simpson, the engineer, could ever have conceived the idea of submitting items such as those in a claim in respect of the suspension of a contract? If Mr. Simpson did submit this claim, as Messrs Carter & Co. allege—although it is in Mr. Carter's handwriting—there can be no doubt that it was submitted on the assumption that there would be an absolute stoppage of the contract. Each item in the claim shows that. When Mr. Carter saw that there was a question of the Minister's calling for tenders for Contract 79, he at once saw Mr. Hickson, and that gentleman, I presume, said to him, "Well, it will be difficult to overcome the Minister." It was then, we may presume, that Mr. Carter produced his claim in respect of Contract 72—and that Mr. Hickson, without seeing what it actually contained, and knowing nothing, except that it was conveyed to him by Mr. Carter, went to the Minister and advised him to accept Carter & Co.'s tender for Contract 79 upon the understanding that their claim in respect of Contract 72 would be withdrawn. Now the suspicious business about the whole of this transaction lies in these constant interviews between Mr. Carter and Mr. Hickson. Here is another suspicious circumstance. Is it at all likely that a man so shrewd in business as is Mr. Carter, shaping his everyday business to a course of gain, would have paid Messrs. Bond and Hudson a sum of £750 three months before he got this particular contract, unless he really was sure that his firm would obtain it? Let me refer your Honor to Mr. Hudson's evidence upon page 254:—

9072. Did you go to the clerk in the tender room—to the officer in charge of tenders? I cannot say, speaking from memory.

9073. He never informed you that Mr. Bond had withdrawn his tender altogether? No.

9074. What did he tell you? He said we could get back our money by applying for it.

9075. And that you could take your tender up at any time? He said that we could withdraw our money without prejudice.

9076. Without prejudice to your tender? Yes.

9077. Was there any probability to your mind of the job's being gone on with? Long before that I asked when the department were likely to go on with the job. I was continually coming down to know if the department were going on with it, and they said they were not likely to be going on with it for two years.

9078. Could you not recognise the officer you saw if he were brought here? No, I cannot say that I could.

It will be clearly seen that Mr. Hudson, in spite of the fact that ample money was voted for Contract 79, and that there was not the slightest doubt but that the work would be sanctioned at an early date by the Minister, was humbugged in this way by the office. I will direct your Honor's attention to Mr. Carter's evidence upon page 253. He said, in answer to my questions:—

9026. *Mr. Parkes.*] When you made the arrangement with Mr. Bond, which has been referred to this morning, did you then give him a promissory-note? No; I gave him a cheque.

9027. For what amount? £750.

9028. That was another £750, then? Yes.

9029. In all, then, you paid Mr. Bond £1,500? Yes.

9030. First you gave him a cheque for £750 and then a promissory-note for £750? Yes.

9031. Did the cheque go through the account of Carter, Gummow, & Co.? Yes. I have some faint recollection of the agreement which has been referred to. To the best of my recollection it was torn up in Mr. Bond's presence.

9032. Was it after the promissory-note had been paid that the document was torn up? Yes.

9033.

9033. *His Honor.*] I do not understand how it comes about that the promissory note bears this date;—was that the date of the transaction? No; the transaction occurred towards the close of 1891. Your question refreshes my memory to some extent with reference to the agreement. There were only a few words in it. It was to the effect that we were to pay Mr. Bond £750 down, contract or no contract—I risked that £750—and that if the tender were accepted a promissory note was to be given to him for the balance of £750. I presume the tender would be accepted about that date—that is, the 23rd March—and that I then gave him the promissory note.

9034. *Mr. Parkes.*] The contract was signed on March 13th, was it not? Yes; you will see that that would allow me ten days for the transaction of this business with Mr. Bond. The cheque to Kenwood and Kerle was a payment for services rendered.

9035. Why did you not pay that in September instead of March? They were not entitled to it until the transaction was completed.

9036. It was not completed until the payment of the promissory note in June, 1892? I think that when I once gave the promissory note the transaction was settled.

9037. *His Honor.*] Then it cost you £1,700 to get the contract? Yes.

Then let me refer your Honor to Mr. Kenwood's evidence upon page 251. He there gives a very clear illustration of the manner in which Mr. Carter went about obtaining this contract by buying out Bond and Hudson. Now, the fact of Mr. Carter's paying so large a sum as £750—an amount which his firm were really not in a position to pay at that time, as is evidenced by their giving a P.N. later on, and by a perusal of their banking account, Weedon's money at that time being paid into it —

*Mr. Carter:* That is entirely a misstatement.

*His Honor:* Mr. Weedon's money was paid into the account long after that.

*Mr. Parkes:* A perusal of Mr. Christie's evidence and the bank-books of Carter & Co. will establish the fact that Mr. Carter had at that time an overdraft at the bank; and the fact of his giving £750 in this way, at a time when the firm were in need of work and money—because Mr. Carter said in his own evidence that there they were at the end of their work—is conclusive evidence that he must have had some assurance—that he must have relied implicitly upon what he could do with the Department, founded, possibly, upon a knowledge of what he had done with the Department before. There must have been something of this kind operating upon his mind to justify him in giving away this large sum of £750. I do not think I can be called abnormally suspicious because I look at the transaction in that way. Keen business people do not hazard money in that way; for it must be remembered that in this case it had been mentioned that tenders were to be called for. That being so, Mr. Carter must have had some assurance that his own firm would receive the contract. Mr. Barling, no doubt, gave instructions in perfect good faith that tenders were to be called, and he believed, no doubt, that they would be called; but, as against that, we have Mr. Hickson, on the last day of tendering, or within eight days of the receipt of this statement of claim from Carter, Gummow, & Co., appearing at the last moment to check Mr. Lyne's hands with regard to the tendering. These are facts which have a very suspicious appearance. I am coming now to the nature of this contract, and as to the way in which it was altered after it had been let. We have in Mr. Davis' evidence a statement in which he says:—

Since the inauguration of the Sewerage Branch in November, 1879, up to the present date, 117 contracts have been let and completed, with the following result:—Amount of tenders, worked out at schedule rates, £1,440,225; total amount of final vouchers, £1,433,186. Showing that the amount of the tenders worked out at schedule rates has exceeded the amounts of final vouchers by the sum of £7,039, or a saving of that amount in about one and a half million pounds worth of work. It will therefore be seen that, although speculative tendering has been in vogue for sixteen years, while in some cases the quantities at schedule rates worked out to more than the amount of the tender, the opposite occurred quite as frequently.

This is merely a statement. There is no documentary evidence in proof of it. The agreement between the returns might be simply the result of accident, because the rearrangement of the schedules might bring that about, and yet give to the contractors working under them a vast advantage in obtaining a greater amount of money at the conclusion of the contract than they anticipated when they started. Take the schedule of Contract 79. The tender amount was £39,000, and Mr. Davis claims that it worked out at £40,000. But notice the items which are eliminated. The items upon which the contractor carried out the work were not the items which he put into his tender. For instance, there was no timber left in the shafts, and other items such as subducts, handpacked filling, brickwork, permanent puddling, surplus material, and a lot of other items were decreased, a number of other items being increased; so that really the schedule upon which the contract was completed was not at all like the schedule upon which the

the firm tendered. As a matter of fact, Carter & Co., as shown by Mr. Thompson's evidence—and it has not been answered by the Department—benefited by the readjustment of the schedule to the extent of about £3,000. The matter is referred to in Mr. Thompson's evidence upon page 306. It will be seen, upon reference to the joint report of Mr. McCredie and Mr. Thompson, which appears on that page, that they do not proceed on the basis taken by the Department, for it must be admitted that there was only a certain proportion of work specified in the Government schedule to be gadded out, and a certain proportion, as specified, to be blasted out. Mr. Davis's memo. deals with this matter, in reply to Mr. Thompson, as if the Department had the power to substitute throughout the work gadding for blasting out. Mr. Thompson proceeds upon the proper assumption that the Department only substituted the blasting for the gadding in the proportion of 800 cubic yards which they put into the specification. He takes as a basis—and it ought to be a fair basis—not the rigged schedule of Carter, Gummow, & Co., but an office valuation originally thought to be Contract 79, but which turned out to be Contract 79A, on account of the departments being unable to produce their original schedule of Contract 79. In respect of Contract 79A, a continuation of Contract 79, it may be fairly argued that the proportion of the items represents the proportion of the items in the neighbouring contract, and in that the department, according to the schedule which appears upon page 339 of the Parliamentary return, put down excavation in hard rock where gadding only is permitted, 72s., and excavation in hard rock where charges of powder four inches in length are permitted, 55s., the difference being 17s. If you look at any departmental schedule you will see that they put the guttering and gadding down at an increased price over the blasting. Of course, manual labour is a great deal the more costly way of carrying out this work than blowing it out with powder. Mr. Thompson has taken a very fair basis, I submit, in doing that. It was a larger and more expensive work, and he would have been inclined to increase it. Your Honor asked him a very pertinent question as to whether, the contract being a larger and more expensive contract, the items would not have been increased. That would be so, and the basis, I submit, is a fair one, to show that the substitution gave the contractors a great benefit. I will show that Mr. Davis's memorandum is on an entirely wrong basis, because the contractors were paid to within half an inch of the full limit of the concrete which would have been paid for if the contract had been carried out according to the letter of the specification. I will now read the report of Mr. McCredie and Mr. Thompson :—

Varney Parkes, Esq., M.L.A., Public Works Inquiry Commission.

Dear Sir,

250, Pitt-street, Sydney, 23 July, 1896.

We have carefully gone through the schedule and final voucher in connection with Contract No. 79, and have the honor to report as follows :—

*Item No. 1.*—In this item the schedule quantities give 800 cubic yards of "excavation in tunnel, guttering, and gadding," and the final voucher has 21·22 cubic yards, showing a deduction of 778·78 cubic yards, which latter quantity was allowed to be carried out as excavation with 4-inch powder, at a merely nominal reduction in cost of 3s. per cubic yard, as per schedule, whereas the proper difference in value would have been 17s. per cubic yard, thus the alteration benefited the contractors by 14s. per cubic yard, amounting to £545 2s. 11d.

Had the above-mentioned 778·78 cubic yards been carried out by guttering and gadding, we would point out that the contractor would have had a loss of 9s. per cubic yard, which would have amounted to £350 9s., based on the Department's estimate of 72s. per cubic yard.

*Item No. 5.*—The schedule quantities give 361 cubic yards of guttering and gadding in shafts, while the final return shows that excavation with 4-inch powder was substituted, which would give the contractor an increased profit of 5s. per cubic yard, amounting to £90 5s.

*Item No. 17.*—In this item there is an increase of 852·17 cubic yards of sandstone concrete in the final return over the quantity shown in the schedule, which would result in the contractor gaining a profit of 7s. 6d. per cubic yard, amounting to £319 11s. 3d., the Government estimate being 30s. per cubic yard.

*Items Nos. 10 to 15 (inclusive).*—For these items the contractor only allows £3 4s. 2d., while a fair cost would amount to £238 15s.; and as they were not carried out, the contractor was saved a loss of £235 10s. 10d.

*Item No. 20.*—This item, 180 cubic yards of brickwork, the contract rate for which was 20s. per cubic yard, or £180, was omitted; whereas the Department's estimated value is 60s. per cubic yard, and which, if it had been carried out, would have resulted in a loss to the contractor of £360.

We may point out that in Item No. 4 the schedule quantities give 75 cubic yards excavation in road surfaces, whereas the quantity paid for was 541·77 cubic yards; and as the contractor's price was 78s. per cubic yard, against the Department's estimated value of 6s. per cubic yard, this increase gave the contractor an additional profit of £1,680 7s. 5d.

We are, &c.,

GEORGE MCCREDIE,  
W. THOMPSON.

It will be clearly seen that the department was conferring benefit by the rearrangement of the schedule, although it came out at £40,000 with the addition of £1,200 for a branch sewer, and the addition of other small works Carter & Co. received by the readjustment of the items, a great benefit over and above the contract which they signed. Let me come now to Mr. Davis' explanation of this matter in his memorandum.

*His Honor:* I would point out that the only readjustment was the substitution of 4-inch powder blasting for guttering and gadding. All the other items adjust themselves, leaving out, of course, subducts.

Mr.

*Mr. Davis* : I have not wished to interrupt Mr. Parkes, although I might have done so repeatedly for the purpose of correcting misstatements. In this case he seems to have forgotten the fact that the statement of Mr. McCredie and Mr. Thompson was practically withdrawn, and that we had no opportunity to cross-examine them in reference to it.

*His Honor* : If the proportions were the same and the quantities greater, then the difference would be proportionately greater, and it is upon the difference that the argument has been founded. At the same time the only readjustment lies in the substitution of blasting for guttering and gadding.

*Mr. Parkes* : With reference to the statement which Mr. Davis has just made in regard to Mr. McCredie and Mr. Thompson, I should like to point out that they were both brought back for the purposes of cross-examination, but that the department declined to cross-examine them. Mr. Davis' statement that the contract would come out at a certain amount is a fallacious statement. With an indefinite schedule it is impossible to make a calculation of that kind. I will deal now with Mr. Davis' statement as to the subducts. He has made an estimate showing the amount of saving in this respect. It will be found in his memorandum No. 6, upon page 508 of the printed evidence :—

When the shafts were sunk to the level of the tunnels, and the contractors were about to start driving, comparative estimates were made for the different modes of excavating the tunnel provided for in the schedule. Although the price for guttering and gadding was somewhat above that for blasting—taking into consideration the fact that if the tunnels were driven by the latter means they could not be taken out to the precise size required, and therefore more concrete would be used in the lining than if the excavation were done by guttering and gadding—it was found the department would effect a saving of about £1,250 on the whole length of the tunnels, if they were taken out without the use of explosives. The contractors saw the Engineer-in-Chief in my presence respecting the matter, and offered, if they were allowed to do the excavation by the use of 4 inches of compressed powder, to allow an equivalent to the above sum in the quantity of concrete paid for. On these conditions the Engineer-in-Chief approved of the excavations being done by blasting, and the work was carried out accordingly; and in the final voucher the concrete which was included was reduced equal to £1,302 9s. 8d.

Mr. Davis shows in his statement that the total amount of sandstone packing in the tunnels paid for, less the Ernest-street branch, was 421 cubic yards; and that in the bluestone sewer 1,219 cubic yards, less the Ernest-street branch, were paid for. The summary shows the amount saved on the sandstone concrete as £705, and on the bluestone concrete £596; that is upon the assumption that there were only 2 inches of lining paid for. But, as a matter of fact, if your Honor will turn to page 318 of the Parliamentary papers, it will be seen that the amount of lining which was allowed was  $3\frac{1}{4}$  inches over and above what was required to make the periphery of the sewer. Coming to the actual facts of the case, it is provided in the specification, as has been stated by Mr. Davis, that when blasting is carried out on these contracts there shall be a limit of 4 inches margin in the concrete to be paid for. I will take Mr. Davis' figures. He says there were 421 yards of sandstone concrete, omitting the Ernest-street branch—a very small amount, some 90 yards. I will ask you to turn to the voucher upon page 333 of the Parliamentary return. How is it possible that such a saving can be made when we see that, according to the final voucher, sandstone concrete assumed the dimensions of 1,872 cubic yards, and bluestone concrete the dimensions of 1,562 cubic yards? Those were the quantities that were actually paid for, the quantities in the tender schedule being 1,023 and 1,390 yards respectively. As a matter of fact, the so-called saving in this matter was no saving at all, but was a great benefit to the contractors. I have pointed out in respect of Contract 79 those which I consider to be the main concessions which were granted to these contractors. All that I have to say, in concluding my remarks as regards that contract, is that where the contractors are dealing with the public those who have charge of the public interests should not always think of the position of the contractors, and try invariably to do that which will meet their convenience or produce profit for them. It has been shown that, in this case, everything was done by the department for the contractors; every action taken by the department tended to give them the best advantage which they could have obtained upon the contract. From the very first, when an opportunity was given to them to buy off Bond and Hudson, up till the time when the final voucher was paid, everything upon the contract was worked to the advantage of the contractors. The State has some say in the matter, and it certainly ought to have some definite method of carrying on its work. When the Public Works Department calls for competitive undertakings it ought at least to have a fair basis upon which the competition can take place, so that it will get the full benefit of it. I come now to Contract 72 itself. I have dealt pretty extensively with that contract during the time I have been dealing with Contract 79, but I should like to point out clearly to your Honor what was the position of that contract, beginning with its earlier stages. In the first place, the department submitted an estimate to Parliament that £15,500 was required to build a sewer from Munni-street to Shea's Creek.

Parliament

Parliament voted that money upon a very definite scale. The lowest tender, according to the Parliamentary papers, which came in for Contract 72, for the amount of work competed for—that is, from Shea's Creek to a certain chainage—was £20,650. Then this question came up—that if that tender were accepted the work would have to go before the Public Works Committee; and, in order to avoid that course, the estimate was reduced, as Mr. Davis has admitted in his minute, by £3,000, making the contract sum about £17,700. In order that the work might come within £15,500 which was voted—if that question should arise—a clause was put in the specification, which appears upon page 141 of the Parliamentary return. I refer to clause 3, which has been so often read before the Commission. That clause provides that at a certain time, if a further sum of money had not been voted in a succeeding Loan Bill, the portion set forth in the clause, or any other portion, might be cut off from the contract. As the work proceeded the department seemed suddenly to find out that they had not a proper outlet, and, as regards that point, it seems very dubious whether they were right in coming to that conclusion. However, they did, for whatever reasons, come to that conclusion. Below the level of this sewer there was running Shea's Creek; and it would have taken, without any channel whatever being cut, the output. It was simply a question of cutting some 50 feet between the end of the sewer and Shea's Creek. That would have taken the water without any necessity for cutting the channel at a different level through which to run down the water.

*His Honor* : I understand that there was a flat without any definite channel at all.

*Mr. Parkes* : At all times there was a channel of sufficient depth to carry away any water that might come from the sewer. If you examine residents in the locality your Honor can soon settle the point, if there is any doubt in your mind.

*Mr. Davis* : That question was fully gone into in M'Namara's case.

*Mr. Parkes* : I should like to know how it was possible to connect the channel, which was only 5 feet 6 inches, with the sewer, which was about 12 feet.

*Mr. Davis* : The greatest depth would be 7 feet 6 inches.

*Mr. Parkes* : The channel was much less in depth, as shown by the drawing, than was the sewer. The level of the land must have been below the top of the sewer, and the channel without a doubt was cut without any necessity. Even supposing we allow that there was a necessity, it was an extra in every sense of the word, and was no part and parcel of the contract in the first instance. However, this channel was cut, and the claim in Carter & Co's. case is that they had the most expensive portion of the work to do in the first instance. Now I want to know how it is that, if the wrong end of the contract was commenced, Carter & Co. did not object to that. The truth is that they commenced at the end of the contract in respect of which they received the greatest amount of remuneration for the work they were doing. They commenced at the end where they had nothing but soft sand cutting at the extravagant price of 2s. 6d. for excavation and 1s. for refilling. That is the reason why the contractors commenced at that end. This clause would apply to any portion of the work, whether it was commenced at one end or the other. The clause allows of a certain amount of money being expended, and there is then power to terminate, permanently or temporarily, any portion of the contract. It was found ultimately necessary, after notice had been given by Mr. Hickson to the contractors in October, 1891, to obtain an extra amount of money, to be hurriedly voted by Parliament, for the continuation of the work. The department immediately set about doing this. They set to work to make out their reasons for the vote, and they then persuaded the Minister to put an amount on the Estimates. The amount was so put on and passed. Now it is well known that Loan Bills are generally introduced, not at the early part of a Session, but towards the close of it. If you search the records of this particular case you will find that the Bill, at every stage, had this £9,000 in it. Carter & Co. must have known that the work would be continued. The department certainly knew, Mr. Hickson's letter being written to meet the contingency of the works not being continued, or the happening of any accident. During the whole of this time Carter & Co. were working upon this contract—that is beyond dispute—and within a few weeks of the time of the notification of the second contract. Now on the very day on which the Loan Bill was passed through Parliament, Mr. Hickson notified Carter & Co. that their contract would be continued. Where, then, is there any equitable claim in respect of the contract? Where is there any justification for the statement to the Minister that Carter & Co. had an equitable claim for that very short suspension, when, as a matter of fact, the firm received an extension of the contract at very excellent prices? Instead of an injury being done to the contractors in respect of this contract, a vast benefit was conferred upon them by giving them this extra work and associating them with the contract right through. If the Public Works Department manages the whole of its contracts in the way in which Contract 72 was managed, then I certainly do not think Mr. Smith's remark that Mr. Hickson has shown to the country throughout this inquiry that he has ever looked to the safeguarding of



the interests of the public is very well established. I will now take up the question of the rigging of schedules, and especially with respect to Contracts 69 and 79. In the first place I should like to point out to your Honor that in any work of this description the first care of an engineer should be to get the most definite proposal possible put down in the plan and specification. After this definite proposal has been so put down, the contractors can compete fairly for the work. In order that they may be enabled to do this, proper borings should be made right to the depth of the contemplated sewer. This has not been done in the case of departmental work, and the particulars, form, and manner, of the schedules, even up to the present day, is not at all satisfactory. The different classes of material are so confusingly put together that they must inevitably lead contractors at all times to speculate in their prices. The first reason and prime basis of speculation by contractors in tendering is to be found in the indefinite manner in which information is given to them by the department. As a matter of fact, that information is given in such a manner as to invite speculative tendering, and to result in benefit to the contractors rather than to the public. As regards this question, let me refer your Honor to the evidence of Mr. Young, upon page 358, and to the evidence of Mr. Dean, upon page 349. Speaking generally as to that evidence, it shows conclusively that these men, who are the two oldest of the contractors in and about the city of Sydney, if not in New South Wales, are not familiar with the methods of schedule rigging which were adopted by Carter, Gummow, & Co. in their tenders for Contracts 69 and 79. It is contended by the department that this is an existing evil; but the fact remains that the tenders of Carter & Co. for Contracts 69 and 79 contained prices of a most extravagant nature. I will turn, for a moment, to Mr. Bagge's evidence, on page 404. Mr. Bagge was an officer of the department for a great number of years. He is evidently an honorable old man who understands his business, and he seems to have been wonderfully struck by the nature of the tenders which were sent in at that period. He says, in his evidence, it reminded him of what had taken place in Victoria.

I remember that when this rigging occurred in Victoria an officer of the Public Works Department reported the matter to Mr. Wardell, Inspector-General of Public Works, and complained about the practice. The matter was sent to the Crown Solicitor, and that officer wrote a minute to this effect:—He said “that the engineer was responsible to his employers for the work being carried out within the sum tendered, and that if, therefore, a contractor gave speculative prices upon certain items, he should not be paid those speculative prices, but must be allowed only so much, permitting of the remainder of the work being constructed within the amount of the contract if an emergency should arise.” We acted accordingly in Victoria.

Mr. Bagge had not seen the schedules from the time he left the office, perhaps for a much longer period than that, and if he could recollect them you will see that, from the very nature of the schedules, his memory must be pretty good. At all events he was very exact upon this point. The schedules showed that where other contractors were allowed 30s. and 50s. for shaft excavation—the first work done upon these contracts—Carter & Co. were allowed the enormous sum of 78s. Now Owen, a man who excavated for Carter & Co. by sub-contract, stated clearly in his evidence that this work cost 15s. a yard let out to sub-contractors. That being so, the contractors must have made an enormous profit. Owen's evidence will be found upon page 179.

6679. Do you know what was paid to the men working in the shafts? Fifteen shillings when they started and more when they got deep. When they got down to a good depth 17s. 6d. was paid, and it rose afterwards.

6680. Did they ever get over £1 in the shafts? I do not know what they got, but I do not think so.

It will be seen from this evidence that the profits of the contractors upon shaft excavation were remarkably good, and that it agreed with what Mr. Bagge pointed out. It is very likely that it would be so, seeing that in his estimate for Contract 79A he has put in figures corresponding to a reasonable proportion. He says upon page 404, question 13106:—

Of course Carter, Gummow, & Co. are an old firm, who have done a quarter of million pounds worth of work for us, and I can well understand that they would have no intention of dropping the work. Still there may be trouble in the money market in the getting of money, and my opinion is that they are simply endeavouring to raise money out of this part of the contract with which to complete the remainder of the job.

It is a significant fact that at the commencement of this job the second payment to Messrs. Bond and Hudson, who were bought off, was made on a promissory note.

I told Mr. Hickson further that I thought the tender ought to be sent back to Carter, Gummow, & Co., with a request that they would re-arrange their prices in proper proportion, not exceeding the sum total of the contract.

The

The object of Mr. Bagge in sending back that tender was to so fix the schedule that in paying the contractors the department would not put the country to the risk of making over-payment, in case trouble came. It was the action of a dutiful and faithful officer of the Crown. He continues—

Mr. Hickson, however, said that would not do, and that we must stand by the prices. I told him that in Victoria a contract such as that would be returned to the contractor with the request that he would remodel his prices.

I have already quoted the evidence which immediately follows, but, further on, Mr. Bagge says:—

I remember saying to Mr. Davis at the time, "It is all very well for Mr. Hickson to say that, but we do not know what may occur. We cannot tell what trouble there may be in store for us. Don't you pay the full quantities, whatever you do; be sure to keep sufficient money in hand to cover the contract." That, I honestly believe, Mr. Davis did. I remember his saying "You need not feel afraid; I do not return the full quantities. I always keep sufficient money in hand to render us perfectly safe."

He said later on that, in addition to calling Mr. Hickson's attention to Contract 79, he had also called his attention to the schedule of Contract 69, and especially to the item of £50 for bluestone pitchers. Now he was cross-examined very severely by Mr. Davis—and Mr. Davis did not spare Mr. Bagge when he cross-examined him—with regard to Contract 69. I will ask your Honor to turn to Mr. Bagge's evidence at question 13190—

13190. With regard to Contract 69—was it before or after the receipt of tenders that you saw Mr. Hickson with regard to the price of £50 per square yard for bluestone pitchers? If I saw Mr. Hickson it would always occur when the tenders were sent up to me. The tenders would come up to me from the Board. I then looked through them and recommended the acceptance of a certain tender. If I saw any incongruity in connection with a tender, I would direct Mr. Hickson's attention to it.

13191. Are you sure that you went to Mr. Hickson and pointed out to him this price of £50 for bluestone pitchers? Yes.

13192. You are sure of that? Yes.

13193. Why did you not put it in your recommendation? For the simple reason that Mr. Hickson told me that it was of no use objecting, and that we should have to pay the price given. He insisted upon the price in the schedule being paid. I suggested that the tenders should be sent back to Carter, Gummow, & Co., and that they should be asked to revise their prices, but he said that that could not be done.

Leaving that evidence for the moment, I wish to comment upon the item in the schedule of Contract 69 relating to the bluestone pitchers. That, I think, is beyond what may be called fair speculation—fair, honest, dealing. If anyone took advantage of a mistake of that kind in any other business—if he insisted upon the payment of money at a rate like that—if he endeavoured to obtain money in that way, he would be liable to get into trouble. In this case, if it is to be admitted—as Mr. Carter, Mr. Gummow, Mr. Davis, and others have admitted—that an advantage was taken of this £50 being an absolute mistake on the part of the department, and of the putting in of 12 yards instead of 37, then I say that, if ever there was justification on the part of the head of a department for determining that the contractor should not be allowed to take the advantage, that he should not be paid at such an exorbitant rate, it would exist in this case. There cannot be the slightest doubt about that, surely. Where 500 per cent. was being paid upon a particular item, surely the head of a department should have used every effort possible to prevent an imposition upon the State. In regard to this particular item, the sum of £1,850 instead of about £37 was paid. Mr. Davis, in his examination, admits that Mr. Hickson did not express any wonderful indignation in seeing this sum of £50. He says that Mr. Hickson looked at it in a casual way as forming part of a rigged schedule, and determined that the price must be paid. The strange part of the evidence of Mr. Davis as to this schedule will be found in his memorandum upon page 497, where he says:—

From my own knowledge, it has been the habit for a number of years for tenderers to take advantage of the uncertainty referred to. No doubt, in the case of Contract No. 69, the speculation assumed serious proportions. When Mr. Hickson saw the pitch it had reached, as indicated by that contract, he decided to adopt an entirely new system, which has since been introduced, where applicable, in the other branches of the Department of Public Works, and also by the Board of Water Supply and Sewerage, and, I understand, by his advice, by the Melbourne Board of Water Supply and Sewerage, where the same difficulty was being experienced. The tender for Contract No. 69 was received on the 27th December, 1893, and the first tender under the new system was received in March, 1894; no time, therefore, was lost after the receipt of the tender for Contract No. 69 in adopting the new system.

I will ask your Honor to turn now to another portion of Mr. Davis's evidence, where you will find him saying:—

I should like to add, with regard to the bluestone pitchers, that it is usual, when a contract is let, to forward to the supervising officer a schedule of prices, which is really a copy of the contractor's tender. At the time Contract 69 was let that was done. I received a schedule, and in that schedule a clerical error was made. As it happened, it proved to be rather a serious one. The clerk, instead of putting down £50 opposite the item of bluestone pitchers, had put down 50s. per square yard. It was not until the beginning of May that I discovered that there had been a mistake. So that from December until May I was carrying out the contract upon the assumption that the bluestone pitchers were to cost the department 50s. a square yard, and not, as it turned out, £50 per square yard.

Mr. Hickson has also given evidence confirmatory of that given by Mr. Davis on his behalf—that the department never observed this price of the pitchers until the date of the May certificate. Then how is it possible, I asked, that they could have let the first contract in March, or have called for tenders early in the year 1894. They would have had to compile the specification and schedule about the time tenders were coming in for Contract 69; so that if they altered the old system, and first adopted the new system in the case of Cook and Webb's tender, it would have been long before the month of May when they first found this price for bluestone pitchers in the schedule. I will not go to the length of saying that it was absolutely so, but to my mind the real truth of the matter was this—the first contract under the new system was McSweeney's contract, No. 112, in 1895. I asked Mr. Hickson very particularly as to the change in the schedule, and he said in his evidence upon page 578:—

17407. Cook and Webb's contract was for an annual supply of ironwork, was it not;—it has been referred to as the first contract let under the new system? I forget which was the first contract.

17408. Are you not aware that the Treasury has for years past called for all its supplies upon a schedule upon which tenderers have been asked to tender at a percentage above or below given prices, or at par? Yes. The same thing applies to the Works Department.

17409. Then the change of system was not an innovation? Entirely, as far as public works themselves are concerned.

17410. But in other departments it has been adopted for perhaps twenty years in connection with annual supplies? It has been done in the Works Department for years so far as annual supplies are concerned.

17411. This contract of Cook and Webb's was a contract for annual supplies, was it not? That I could not say, speaking from memory.

17412. It was for the supply of ironwork for sewerage contracts, was it not? I should have to see the specification before I could say whether it was for an annual supply or not. It does not appear to be very clear from the specification whether it was for an annual supply or not. It appears to be for a definite quantity of material for sewerage contracts.

17413. But, ordinarily, all these contracts for the supply of material are called for annually? Ordinarily, that would be so, so far as the supply of material is concerned; but this is a different contract. It is not one of the ordinary contracts for a supply of material.

17414. It is for the supply of ironwork for all contracts, is it not? Yes.

As a matter of fact this system of tendering is not a new thing. It has been adopted in connection with the Treasury supplies—that is, all annual supplies for the public departments are called for on this system of tendering at par, and a percentage above or below schedule rates. Mr. Davis has taken this contract of Cook and Webb's, which was really one of these contracts for ordinary supply, as if it were the first contract let under the new system of tendering.

*Mr. Davis:* There is no evidence to that effect. The evidence is to the contrary.

*His Honor:* The system seems to have been adopted in the case of annual supplies, but not upon ordinary contracts.

*Mr. Davis:* The evidence is that Cook and Webb's contract is just the same kind of contract as had been let for ironwork previously. The same system was adopted as was adopted in the case of Contract 69.

*His Honor:* What I understand you to mean is, that in former similar contracts to that of Cook and Webb the schedule system was adopted, although in many ordinary annual contracts the other system was adopted.

*Mr. Davis:* Yes; there is no doubt that in many cases the other system was adopted.

*Mr.*

*Mr. Parkes*: If Cook and Webb's contract was the first contract upon which the new system was adopted, of what value is the evidence that the £50 for bluestone pitchers was first seen when the May voucher for Contract 69 was presented for payment. In order to allow for the tenders coming in in March, the schedule would have had to be prepared for the contract at about the time the tenders for Contract 69 came in. That is December, 1893. If that be so it strongly supports Mr. Bagge's evidence, when he says that he showed this item of £50 in the schedule to Mr. Hickson, and that it was known both to that gentleman and to Mr. Davis. If it had not been known to these gentlemen they would not have so prepared the schedule for Cook and Webb's contract, the tenders for which came in but a few months afterwards, actuated as they say they were by Contract 69. Mr. Hickson, upon page 578, says:—

17415. Sometimes you called for the supply of leather and other materials for use on contracts? For use in the department.

17416. Those tenders are called always on a system under which tenderers can tender at a percentage above or below prices or at par? Yes. That has been in force for years. I do not claim any originality in respect of the system itself. The originality lay in the application of the system to public works. That had never been done before. I got the Water and Sewerage Board to take the same course.

17417. They had been doing so before, had they not? Not on sewerage contracts.

17418. But on water contracts? I do not know about those.

We had Mr. Smail's evidence that the system had been adopted for years previously in connection with water-pipe contracts.

*His Honor*: The general idea was not new; there is no doubt about that.

*Mr. Parkes*: Mr. Hickson also replied to some questions by your Honor with reference to the same matter. The evidence will be found upon page 50:—

1796. You concluded, therefore, that the fairest plan would be to take off an estimate of each item, and to let the contractors tender at, above, or below, it at a fixed ratio? Yes. I think that is the proper way to do the work, though, of course, none of the contractors liked the change.

1797. It was a new idea so far as your experience goes;—it had not been adopted in the other Colonies? I do not know of any place where it had been adopted before. As a matter of fact, I know that it is not adopted in the Railway Department in this Colony.

I merely point this out to show that unless documentary evidence is produced, showing clearly when the change did take place, the assurance ought not to be accepted merely upon evidence of that description. We ought not to have merely word-of-mouth evidence in a matter of this kind. Another thing I wish to point out is that, as a matter of fact, if Cook and Webb's tender was not the first tender which was accepted under the changed system, then the first tender which was accepted would be a genuine contract for sewerage work—work of a definite nature. I refer to Mr. McSweeney's Contract 112. The tender for that work was not accepted until the commencement of 1895. In point of fact, the reason why the change in the system was made was that public comment, as well as comment in the office, was very severe in regard to the nature of the tenders sent in for Contracts 69 and 79. No doubt an item like that of £50 per square yard for bluestone pitchers is calculated to cause considerable comment among the officers of the department. Naturally, it would be shown to Mr. Bagge, and he would show the item to his superior officer. We have it in evidence from various witnesses that considerable comment was made upon this particular item, and there must also have been considerable comment on the part of the public outside, and particularly among the contracting body. I come now to the statement that it is impossible to alter these contracts when they have been signed—for the Engineer-in-Chief to avail himself of a clause in the specification giving him power to make alterations. Mr. Darley, in his evidence, admits that he interviewed Messrs. Carter & Co., in order to induce them to agree to an alteration in a schedule which had been put in in connection with the Long Cove contract. In that case there was a mistake made in the department by putting down "cwts." for "tons," at a cost of £8. Mr. Darley saw the error and pointed it out to the contractors, who agreed that a mistake had been made, and that the amount ought not to be paid. I should like to know why Mr. Hickson should not have followed a similar course in regard to Contract 69. Surely if the practice held good in one case it would hold good in the other. Had we not Mr. Gilliver's evidence as to the manner in which he was treated in connection with the Rookwood contract. A bridge was to have been built in conjunction with the sewer there. He had a very fair figure for the work, but the bridge was cut out of the contract under clauses 16 and 17 of the specification, which had so often been referred to during the evidence. Mr. Hickson said that there was no parallel between the two cases. He says:—

17154. You heard the evidence of Mr. Gilliver about the cutting out of a bridge on one of his contracts? I read it.

17155.

17155. I think the effect of his evidence was that you ought to have dealt with this item of bluestone pitchers in connection with Contract 69 in just the same way that you dealt with his bridge? That apparently is what he thought.

17156. Will you explain in what way the cases are not parallel? They are totally different cases. First of all, I should tell you that the bridge ought not to have been put in. It was a mistake, and it was left out, not because it was a bad-paying or a good-paying item. I do not know whether the contractors would have lost or made anything upon it, but it was left out because, in my opinion, it was a work which ought not to have been charged to the ratepayers of Sydney. It was not required for the pipe line. All that we required was what we put in at the time—a trestle bridge. As regards a traffic bridge, I maintain that it would have been unfair to charge the ratepayers of the whole suburban area with the cost of such a bridge, which was required only for local purposes. As to the pitching, it was specified for, and the work had to be carried out. I certainly should not have been justified in taking it out because it happened to be a big paying item, unless at the same time I had been prepared to increase some of the low-paying items, which would have been a most dangerous thing to do.

When the bridge was taken out of Mr. Gilliver's contract, there was nothing said about increasing any of the lower priced items in order to admit of that being done; but it seemed that, in the opinion of Mr. Hickson, the building of the bridge was not justifiable, although it was included in the contract, and, entertaining that opinion, he availed himself of the power which he conceived he had under the contract, to cut the thing out. The same argument holds good with regard to the bluestone pitchers. It was equally patent that the ratepayers of Sydney should not be called upon to pay the enormous cost of £50 per square yard for bluestone pitchers. It is an absolutely parallel case. There can be no quibble as to that. There might have been, as Mr. Davis has suggested, and quite properly so, a substitution of special bluestone concrete. Mr. Gilliver, in his evidence, gave an instance where, on the Parramatta Road, bluestone concrete had been used for this purpose. It was used, moreover, in a place where there was pretty heavy vehicular traffic. Why, then, could bluestone concrete not be used in the case of a road like the Illawarra Road. If Mr. Hickson could take the course he did in connection with Mr. Gilliver's contract, there is no reason why he could not have taken a similar course in regard to Contract 69. I cannot see that, in his explanation, he has satisfied the Commission that there is any difference between the two cases. If the argument holds good that a contract, when it has been once signed, cannot be varied, whatever reason there may be for the variation, then Mr. Gilliver was absolutely right in insisting that the bridge in the case of this contract should be built. If Mr. Carter was absolutely right in insisting that he should receive £50 a yard for bluestone pitchers, then Mr. Gilliver was absolutely right in insisting on the building of the bridge. With regard to this question of variation of contracts, I would like to call your Honor's attention to Mr. Smail's evidence, which appears upon pages 400 and 415. The evidence at those two points reads very strangely. Upon page 400 Mr. Smail gave this evidence :—

13000. Have the correspondence or minutes between yourself and the Board been kept? There was just one report, which I forwarded to the Board.

13001. Did you originate that report? Certainly.

13002. It came from you alone? Yes. Of course the district officers may have drawn my attention to the matter.

13003. But it emanated in your office? Yes.

13004. Would you have the papers in the matter? Yes; I daresay they could be produced.

13005. And your report? I presume so.

13006. Then as a matter of fact you did not get instructions from the Public Works Department that you were to carry out this new system? No.

13007. You are the sole originator of it? I was not the sole originator. I was simply copying the practice which we had had in the Water Branch in the laying of mains by contract. The items there were comparatively few, but it was considered that we might apply the same system to larger contracts.

13008. How long had you been using the system? It had been in use in the Water Branch for three or four years before I introduced it into the Sewerage Branch. It was not a new thing, and I do not claim any originality for it.

13009. Who was in charge of the Water Branch? Mr. Trevor Jones. I succeeded him. He was at that time engineer for water, while I was engineer for sewerage.

13010. Had he used it for some time as engineer for water? I think so. The prices were fixed for rock and soil, or whatever the item might be, and the contractors had to tender at par or above or below those prices.

That

That was very emphatic evidence ; but Mr. Smail, in giving evidence further on, said :—

There is one matter I should like to mention. Mr. Davis asked me a question as to a certain contract, and I was misled as to the date. In that respect I should like to amend my evidence. Mr. Davis alluded to Cook and Webb's contract. The copy which misled me showed that the date of letting was 28th March, 1895, whereas, as a matter of fact, it should have been 1894 ; so that the Government Construction Branch certainly got the first contract out under the new system. Our first contract under that system was not let until some time afterwards. I should like, also, to mention that Mr. Hickson, being a member of the Board and also Engineer-in-Chief for Construction, this matter was discussed by him and by me for some time. He had noticed in his department, as I had in mine, that this manipulating of schedules was going on, and as I mentioned in my evidence the other day, we tried to check it. I claim no originality for the new system.

13339. It had been in vogue for some time in your Water Branch, had it not? As a matter of fact, the Water Branch had carried out the system since 1888 in small contracts.

The inference is that Mr. Smail must have been interviewed between the first occasion upon which he gave evidence and the second occasion. It appears to me to be very curious evidence, in conjunction with Mr. Hickson's subsequent statement to your Honor, and Mr. Davis's memorandum as to the time the contract was started and the time at which he found the item of £50 included in the schedule. It is almost certain, I submit, that that contract of Cook and Webb's could not have been the contract which was first taken up under the new system. I believe, from evidence produced, it will be seen that the first contract taken up under the new system was McSweeney's Contract No. 112. I have already pointed out that Mr. McCredie and Mr. Thompson went into the question of the arrangement of the schedule of Contract 79, and their report has been placed before your Honor. Mr. Thompson, who is an able quantity surveyor, carefully analysed the quantities in connection with all the tenders which were submitted in Contract 69. A very curious thing occurred in connection with the sheet of contracts, which appears in the Parliamentary return commencing at page 67, and that is, that Mr. Hickson must have perused, at an early date, these tenders. If you take the schedule of Carter & Co., on page 78, you will see that, in respect of items 74 to 77, Mr. Hickson—he has admitted in his evidence that it was his handwriting—wrote a correction to the effect that the rates quoted were “shillings” per “cwt.,” not “pounds,” the correction being initialed by Messrs. Carter, Gummow, & Co. That shows pretty clearly that he must himself have perused the items in the schedule. He must have done so in order to make that alteration. I was about to point out that Mr. Thompson has gone into an analysis of the cost of this contract, supposing it to have been worked out ultimately upon the schedule given to Carter & Co., and taking the prices put in by the various tenderers. Mr. Thompson proves by his analysis that Mr. Ahearn's tender would have been considerably the best one for the department to accept. Your Honor will find Mr. Thompson's evidence upon page 374. He handed in with his evidence a very carefully prepared statement, showing that Ahearn's tender would have worked out at £6,317 less than the amount disclosed by the final payment made to Carter, Gummow, & Co., and also that MacKenzie's would have worked out at a less price than that of Carter, Gummow, & Co. It was shown that the items selected for Carter & Co., if tendered upon by these various contractors, would have greatly reduced their tenders. It was shown that, although Carter & Co.'s tender looked to be the cheapest at the commencement, they were allowed to so fix their schedules that they received thousands of pounds more upon the work than they were entitled to receive. It is necessary to look into the schedule to see of what a curious nature it is. The Government schedule will be found upon page 62 of the Parliamentary Returns. Take Item No. 2, “Excavation in Hard Shale, Rock, 1,165 yards.” Three different items of excavation are given at the same probable quantity. Items Nos. 6, 7, and 8, also deal with excavation, and contain the same probable quantity, viz., 1,140 cubic yards. Then, Items 9, 10, and 11, are in exactly the same position, the probable quantity being in each case 1,850 yards. It is quite evident from the regular recurrence of these figures that no effort was made to arrive at any data for the excavation. The result of framing schedules with quantities like these is that 9,780 yards is put in for tunnel excavation when, as a matter of fact, the department could have seen from the bores, imperfectly taken though they were, that they would have to use timber and to increase the excavation, and that it would come out more like the amount at which it ultimately did come out, viz., 14,500 cubic yards, when the work was completed. It is evident that a schedule prepared in that way is an invitation to contractors to rig their schedules with the object of getting the best of the Government. Plans were made and bores were taken to a certain depth. Why could not these have been taken to the proper depths? Why could not the department have prepared a complete plan, showing the nature of the borings taken, or, at all events, sufficient of them to show the description of the ground, at the same time preparing a schedule upon the estimate thus formed? But there was no proper estimate. There was a certain guide given, it is true, but a few hundred yards more or less does not seem to have mattered very much so far as the department was concerned.

*His*

*His Honor* : I will call your attention to one thing, as it is a point which might be utilised if there were a right of reply to your address, Mr. Parkes, and that is, that these schedules were, in point of fact, actually prepared by Mr. Bagge.

*Mr. Davis* : There is another thing I should like to mention. Mr. Parkes said that in regard to several of the items the same quantities were used, the materials being different. As a matter of fact, the material in the cases to which he referred is the same. That is only a different mode of taking out the same material. Mr. Parkes made that observation apply to Items 2, 3, and 4, but the same thing applies to what he said in regard to Items 9, 10, and 11.

*His Honor* : That appears to be so on the face of the schedule.

*Mr. Parkes* : Mr. Bagge, as a matter of fact, did not make out the schedules. He merely perused them. They were made out by officers of his department. Various witnesses have described to your Honor the manner in which the schedules were made out.

*His Honor* : Mr. Bagge said, I think, that he went into the matter, and that he consulted Mr. Davis as to the prices. Of course, he would not take out the quantities himself.

*Mr. Parkes*.] Let me refer your Honor to Mr. Bagge's evidence :—

13098. *Mr. Parkes* : Were you in the habit of making up all the schedules for sewerage contracts before you left the department? I made up all the schedules from No. 3 Contract.

13099. Did you prepare the schedules yourself, or were they prepared by the officers of your department? I generally prepared the schedules myself; but the quantities were taken out by a regular staff. I used to inspect the quantities.

13100. Who put in the prices? They were put in virtually by all of us. For instance, I looked to Mr. Davis to inform me carefully of what changes had taken place in connection with outside work, because I had nothing to do with that. Then we had a consultation about the prices in vogue at the time, and the schedule was drawn up accordingly.

13101. In connection with which contract was that? That applies to all contracts. As each contract came out we had a consultation, because the prices were constantly altered.

You will see that Mr. Bagge says that he simply revised the quantities; that he did not absolutely take them out himself. I contend that there is no justification for the submitting of quantities in this fashion. It is offering an invitation to contractors to fix their schedules, as it will be seen Carter & Co. fixed theirs, without apparently going into any quantities—that is to say, they arrived at an average, and met the department in that way. Mr. Davis has laid before the Commission a memorandum dealing with this matter, which appears upon page 499 of the printed evidence. He has gone to considerable trouble to show that subducts, although put into Carter & Co.'s tender at 1d. per yard, were really costing 12s. 2d. I do not think your Honor will look upon the explanation contained in Mr. Davis' memorandum as being in any way satisfactory. It requires a great stretch of imagination to believe that Carter & Co., if they carried out these subducts, would be paid for them at the rate of 12s. 2d. According to the specification the subducts are supposed to contain certain work—that is, the piping, the casing, and the packing. There can be no mistake about that part of the specification. The rock excavation would have to be done at the cost of the contractors, because there is a clause in the specification which says that if powder is used there shall be a margin given upon excavation of any kind in the contract, and that that shall be 4 inches. They could not possibly have taken the value to be more than one-half included in the item of excavation. It is simply absurd. If your Honor will look at the quantities you will see that the department gives estimates for subducts in hard rock at 6 inches internal diameter, 4s.; 9 inches internal diameter, 6s.; 6 inches internal diameter, 7s.; 9 inches internal diameter, 8s. Now, if it were intended that there should be included in that item piping only, why should the department itself put in these extravagant prices when piping is worth at the very most only, when laid, 2s. a foot. Then you must take the excavation. But what would it take to imbed a 6-inch or 9-inch drain-pipe per lineal yard? 3 cubic feet would go to every yard, and there would therefore be 27 feet run to make up that measurement. The contention of Mr. Davis, therefore, is absolutely absurd. The truth is that this item was intended to include the whole of the subducts, and the argument as to the 12s. 2d. is fallacious, the supposition being simply put forward in order to make this catch business of Carter & Co. appear less glaring. If subducts were not to be used in the contract, why put them in? It has been proved in the evidence that subducts were really used, and if there was any contract in the neighbourhood of the city of Sydney requiring subducts it would have been Contract 69, because it traversed a low bed adjoining Botany Bay, very little above sea level, and it might be anticipated that water would come in pretty freely. Carter & Co. are the only persons out of the whole eleven contractors for these works who could venture to put in such a sum of money for subducts. They must have known, absolutely, that they would receive consideration from the department before they would dare to risk that item. As I say, the amount is not included



included in their excavation, and that argument was simply put forward to make the item appear less glaring than it really is. Supposing there was a certain amount of excavation to be added, it would only be about 3 feet, which would be a small proportion, and instead of representing anything like 12s. 2d., it would represent only about 3s. 1d.

His Honor, at 1.5 p.m., adjourned the inquiry until 10 a.m. on Friday, October 9th.

C. E. R. MURRAY,  
Commissioner.

FRIDAY, 9 OCTOBER, 1896.

His Honor, the Commissioner, sat at the Board-room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. Ernest Smith (appearing for Mr. Hickson); Mr. Carter, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising), attended.

Mr. J. Davis, Engineer for Sewerage, and Mr. Norrie, bond clerk, also attended.

*His Honor* : As there has been no cross-examination of any officer of the department upon the question of the cost of subducts, and as I have not yet found time to look up the matter myself, I intend to ask for some explanation as to how the different items have been arrived at by Mr. Davis. I think it would be fairer to you, Mr. Parkes, to ask Mr. Davis to make the explanation now before you resume your address, than to ask him to make it at a later stage when your address has been concluded, unless, of course, you prefer that the explanation should stand over.

*Mr. Parkes* : I do not see that there is much upon which Mr. Davis can be asked any questions.

*His Honor* : You, yourself, Mr. Parkes, did not cross-examine him as to how he arrived at his items for subducts.

*Mr. Parkes* : It has been very clearly explained, I think.

*His Honor* : Mr. Davis gave the amount, I think, but he did not explain how the items were made up.

*Mr. Parkes* : Mr. Hickson gave a description of the matter in his evidence.

*His Honor* : I am aware of that, but Mr. Davis gave certain amounts and you did not cross-examine him upon them.

*Mr. Parkes* : I thought the matter was so definitely stated that Mr. Davis would be only likely to repeat what is already in evidence.

*His Honor* : No particulars were given by Mr. Davis as to how he made up the amounts. I intend to ask him to explain that matter, and I thought of doing so now in fairness to you, Mr. Parkes.

Joseph Davis was recalled and further examined.

*His Honor* : I will now call upon you, Mr. Parkes, to resume your address.

*Mr. Parkes* : The explanation which Mr. Davis has given this morning in regard to the item of subducts does not very much affect what I said to your Honor yesterday, because, after all, what was contained in the specification no doubt was the foundation of the estimate in the departmental schedule, the prices given being from 5s. to 8s. Carter & Co. put down 1d. and the other contractors did not do anything of the sort. If the department add 12s. 1d. for excavation it, of course, makes up the amount, but it does seem to be a monstrous sum for the excavation required—that is, half a yard for the running yard of subduct. If the amount were to be made up the excavation would have to be very large and would be perfectly unnecessary for the purpose. When the inquiry was adjourned yesterday I was dealing with the schedules of Contracts 69 and 79. Mr. Barling, it will be remembered, gave some evidence with regard to the item of £50 a yard for bluestone pitchers in Carter & Co.'s tender in Contract 69. He gave the following evidence in reference to that item:—

13944. You depend for everything of that kind upon the heads of the branches of the department? Undoubtedly.

13945. *His Honor*.] The question is whether, if your attention had been called by one of the heads of the department to this particular item, you would have agreed to the acceptance of the tender? If my attention had been directed to it as a member of the Board of Reference, then, of course, exception would have been taken to the tender.

13946. And the Tender Board would then have gone into the question? Undoubtedly.

Now, my contention has been that Mr. Hickson was shown this particular item by Mr. Bagge. It is pretty clear, from Mr. Bagge's own evidence, and from the surrounding circumstances, that that must have been so—that is, if Mr. Davis and Mr. Hickson are correct in saying that Cook and Webb's contract was the first contract under the new system, and after they had seen the stage to which the rigging of schedules had arrived in the case of Contract 69. There is another circumstance which somewhat upholds Mr. Bagge's testimony as being correct, and that is, that in the Parliamentary papers, on page 305, there will be found a minute written by Mr. Bagge in the early stages of Carter & Co.'s contract at North

Shore, in which he said that Carter & Co. had undoubtedly fixed their prices speculatively to increase their profits on the contract as much as possible to the loss of the department. It has been proved from the evidence that what Mr. Bagge alleges really did take place—that, as he points out, Carter & Co.'s tender for No. 79 was so arranged that the most extravagant prices were put into the first part of the contract. I would point out that even the new specification, or, indeed, any specification, would be of very little effect if there be not perfect data, or data as nearly perfect as possible, put down in the Government schedule and in the Government plan upon which tenders are invited for these works. The old system, supposing definite information were given, would be equally good. It is a system which has been used all over the world, and no doubt it has been used with such effect as we have seen exhibited in the schedules of Contracts 79 and 69, where proper information has not been afforded to contractors. If proper information had been afforded to them in the case of Contract 69—and it could easily have been obtained—no doubt there would have been no opportunity for the rigging of the schedule in the manner in which Carter & Co. rigged it. But, after it was discovered that the schedule had been rigged in this manner, can it be said that it was not the duty of the Government officers to save the country against the ultimate effects of the carrying out of the contracts under such a schedule. I should like to point out that unless proper information and proper prices be given by the department, even under the new schedules, the country will probably have to pay through the nose. Look at the varying nature of the schedules which were submitted in the cases of Contracts 77, 117, and 112—the whole of them being schedules under the new system. Mr. Thompson, in his evidence upon page 117, clearly points out the varying nature of these schedules. He gave this evidence:—

4339. Before we go any further into these figures, I want you to look at the tender forms of Contracts 112, 101, and 77;—what, for instance, is the price set down for bluestone concrete, in the ordinary form, in the case of No. 77? £2 10s. a yard is set down for bluestone concrete in any situation.

4340. What is it in the case of 101? 34s.

4341. In the case of 112, what is the price? £2 5s.

4342. So that the price in the case of 77 exceeds the other two, does it not? Yes.

4343. What is the price set down for special bluestone concrete in the case of No. 77;—I mean the schedule to the original plan? £3.

4344. What is the price of special bluestone concrete per yard in the case of 112? £2 15s., including the placing in position, the mastic plates and bars, &c.

4345. What is the price in the case of 77;—it is £3 without any iron, is it not? Yes.

4346. The material is of the same nature, as far as you can see? I think it is rather better in the case of 112, because it is 1, 1½, and 3.

4347. You mean better than in the case of 77? Yes.

4348. And yet it is set down at £2 15s.? Yes.

4349. Including all the ironwork? Yes.

It will be seen that in one case special bluestone concrete—7, 3, and 2—was put down at £3, and in the case of Contract 112 an extra special quality of bluestone concrete, including ironwork, 3½, 1½, and 1, was put down at £2 15s. Item No. 10 in the schedule of Contract 112 is for special bluestone concrete, as specified in clauses 2, 7, and 8, the price being £2 15s. In the case of Contract 77 the specification provides for special bluestone concrete for the inner lining of the sewer at £3. With reference to No. 112, Mr. Thomson gave this evidence:—

4350. *His Honor.*] What is the composition of the special bluestone concrete in the case of No. 112? One of cement, one and a half of sand, and three of ¾-inch blue metal.

4351. *Mr. Parkes.*] Yet, including the ironwork, it is put down at 55s., as against 60s. in the case of Contract 77? Yes.

Let me now refer your Honor to the specification of Contract 117. It was referred to in Mr. Gilliver's evidence upon page 136. He was there asked some questions with reference to Contracts 77 and 117:—

5053. Coming to Contract No. 77, I believe you are carrying out the adjoining contract? Yes.

5054. In Contract No. 117 you are paid at the rate of 28s. per cubic yard for excavations in rock where charges of powder not exceeding 4 inches in length are allowed? Yes,—less 9 per cent.

5055. That is your actual payment? Yes.

5056. Will that price pay you? I hope so.

5057. Do you think it will? Yes.

5058. You are satisfied with it? Yes. I expect to make 12 per cent. out of it.

5059. Is there any difference as regards the solid rock to be excavated where 4-inch charges of powder are allowed as between Carter, Gummow, & Co.'s job and yours? No; it is all about one class of ground. If anything, they have a bit the best of it, because they have a bigger tunnel than we have, and the bigger the tunnel the lower the price at which it can be taken out.

5060. Have you any excavation in your contract where guttering and gadding only are permitted? Yes.

5061. What is the rate at which you are being paid? £1 15s. per cubic yard, less 9 per cent. The price in Contract 77 is £3 15s.
5062. *His Honor.*] Your contract is No. 117? Yes.
5063. And it follows on from No. 77? Yes; we junction with Carter, Gummow, & Co.'s job midway in the hill.
5064. On the north-west side of White's Creek? Yes.
5065. *Mr. Parkes.*] Let us now take bluestone concrete in any situation—what are you being paid for that? I think the Government price is £2 per cubic yard.
5066. What is the price in Contract 77 for bluestone concrete in any situation? £2 10s.
5067. Do you think £2 will pay you? Yes.
5068. Will it pay you well? I expect to make from 10 to 15 per cent. upon the whole contract.
5069. Taking the whole of the prices, as far as you can recollect them, in the case of Contract 77, they represent a great increase upon the prices in Contract 117, do they not? Yes; in some cases they are 100 per cent. higher.
5070. And the nature of the work is not different? No; it is the same. Their drive, however, is a little larger than ours, and they have a slight pull upon us in that respect.

It will be seen that the schedules vary in prices, although the same class of material, and practically for the same class of work. Unless some definite data be given it will be impossible to prevent contractors from speculating upon one price more than upon another. It will, in fact, be impossible to regulate the matter at all under any form of schedule unless proper and definite information is given to the contractors. Take the case of Contract 69. If proper care had been exercised, and if proper information had been given, the work would have turned out all right both to the office and to Messrs. Carter & Co., and not exclusively to the benefit of Carter Gummow, & Co. I come now to Contract 79A. That is another contract which is let without tender. As your Honor is aware, it was let through Mr. Carter's approaching Mr. Lyne in company with Mr. E. M. Clark, the Member for St. Leonards. Mr. Hickson wrote a minute in which he pointed out to Mr. Lyne that the contract could be carried out at a much less cost than that set down in the Government schedule, if the work were put up to tender. The contract, however, was let to Messrs. Carter, Gummow, & Co., without tender, and upon departmental schedule prices. We have no papers showing the nature of the transaction in connection with this contract. Whether such papers existed or not it is hard to tell, but such papers as have been asked for by the Commission it has been often impossible to obtain. There must have been some papers in connection with the matter, because Mr. Barling in his evidence distinctly told your Honor that he was not consulted in connection with the contract at all, and that the minutes came to him as the first indication of what had been done in connection with it. Whether it was another case of "While you remain in charge of the office the affairs of the country will go on well," or something of that description, it is hard to say. But there the matter stands. The fact remains that the contract was let to this firm, and there is no documentary evidence to show how it was let. At any rate it was let greatly to the advantage of Carter & Co., without any effort at public tendering, to ascertain what was the true cost of the work. A parallel case has been drawn by the department in the extension given to Mr. Gilliver, and two or three other cases in which contracts have been let without tendering. Let me point out the difference in these cases. In the case of Gilliver's contract the extension was let on his own prices, arrived at by an exacting competition upon the original contract. Moreover, it was a similar class of work. In the case of Contract 79A the contract was let, not after competition upon a similar class of work, but after a competition upon a very much more expensive work. It was also let upon the schedule of the department taken out for this reduced class of work upon an entirely different description of contract. There is no parallel between the two cases, and there can be no doubt that whoever may have been at fault the contract ought, in the interests of the public, to have been tendered for. No special effort seems to have been exerted by the Engineer-in-Chief, Mr. Hickson, to impress upon Mr. Lyne that great benefit would have been derived by the public if the contract were put up to open competition. According to Mr. Barling, Mr. Hickson had interviews with Mr. Lyne without Mr. Barling's being in any way informed of the nature of them, the matter being finally settled between Mr. Lyne, Mr. Hickson, Mr. Carter, and Mr. E. M. Clark. There is no evidence to show in what way the matter was finally settled, and I suppose it will have to remain without any further evidence being tendered. As to the advances which have been made upon material, I included that matter in my charges because I consider that special facilities were given to Messrs. Carter, Gummow, & Co., which were not given to other contractors. No case of similar treatment has been placed before the Commission by the department. In the first place, the State is not supposed to be a lender of money. The State is not supposed to be an institution for the financing of contractors. When a public department like the Works Department calls for public tenders it sets out a specification showing certain responsibilities which will be put upon the contractors' shoulders. Upon that specification and the conditions it contains, the contractors tender and enter into an agreement with the Crown. The conditions are inserted for one purpose only, that being to safeguard the public interests. They are clearly set forth in the specification. If your Honor will turn to

to Mr. Christie's evidence upon page 295, you will see that it is clearly defined what is required to be held in hand by the officers of the Department in order to secure the Government against accident in connection with the contract. In the first place, the material is placed upon the site, and there is a clause put into the specification to prevent the removal of the material, because that material becomes part and parcel of the security for the contract; and, although that clause has been referred to in evidence as a clause inserted with the object of allowing advances to be made upon material, I contend, your Honor, that the purport of it is absolutely to afford security for the proper carrying out of the contract, in order that, in case of accident, there may be no delay or loss of money to the State through the coming in of another contractor to carry out the work in the event of the first contractor's becoming insolvent. I will direct your Honor's attention to clause 14 of the specification, which appears upon page 294 of the printed evidence. The first section of the clause is in these terms:—

All approved materials, plant, and prepared work, brought upon the ground for use in or on the works shall be considered, and shall be, the property of Her Majesty the Queen until completion of contract; and contractor shall not take away, remove, or dispose of, any such material or plant or prepared work without the written authority of the Superintending Officer.

I contend that that clause is simply inserted as one of the safeguards of the contract. It is not inserted with any intention that material shall be advanced upon. The plant only temporarily becomes the property of the Crown, for the simple reason that, during the carrying out of the contract, it might be very awkward if the contractors had the right to remove it from the site in the event of any accidents occurring. This brings me to the question of the cash bond. What would be the object of taking a cash deposit for the due completion of the work, otherwise than with the object of holding it throughout the term of maintenance, for the purpose of remedying any defects arising from scamped work which might be discovered after the contract had been completed? The object of taking the bond is to keep the contractors to their work—to make them do proper work. If the bond is returned before the date upon which the contract is finally taken over, then instantly the security is gone, and there would be no reason whatever for providing for it in the specification. The contract might just as well have gone ahead without any bond at all for its due and proper performance, unless the bond money be kept, as the specification distinctly provides, until the term of maintenance has expired, and the work is proved to be thoroughly satisfactory. I intend, later on, to refer to a memorandum of Mr. Davis's with reference to the return of the money in connection with Contract 79. I come now to the retention money. There is no doubt that, as the works proceed, it would be fair to allow for the return of a certain amount of the retention money; but it would not be fair, in the interests of the State, to allow retention money to be returned when payments were being made, or when advances on material were being made, which exceeded the real value of the work and of the material on the job at that particular time, as will be seen to have been the case in that portion of Mr. Christie's evidence in which he draws certain conclusions as to the state of Carter & Co.'s contracts at certain periods. If, upon a given contract, these three concessions are extended to contractors in connection with the cash deposit, retention money, and advances on material, what possible security has the State over the contractors for the due and proper fulfilment of that contract? Let me point out the difference between Carter, Gummow, & Co.'s Contract 79, and the cases quoted by Mr. Davis upon page 502. Mr. Davis there says:—

Fixed deposits were frequently returned to contractors prior to the expiration of the maintenance period—so often, in fact, that the clerk in charge of bonds and contracts had a form struck off to meet such cases; but every case was considered on its own merits. I attach a list hereto, showing some instances in which this practice has been followed.

Mr. Davis has been careful to put the matter in this way: "Fixed deposits were frequently returned to contractors prior to the expiration of the maintenance period." In the case of Carter, Gummow, & Co., however, the facts are these. If your Honor refers to page 333 of the Parliamentary return, you will find the following letter from Mr. Boys:—

*Subject:—State of Contract 79.*  
Department of Public Works, Roads and Bridges and Sewerage Branch,  
North Sydney, 29 November, 1894.

I BEG to report that this contract is complete, with the exception of two sets of bluestone pitchers—one set for shaft No. 4, Ernest-street; one set for shaft No. 4A, Ernest-street. These two sets were ordered, but were delivered on the Marrickville contract in error.

Two off-let valves were on, but, as the valves are made of timber, they swelled, and I had them taken off to be eased and the worm gear cleaned.

The contractors are replacing these to-day, and I will inspect this work when finished.

I think it would have been better for the Department to have put this gear back when the sewer is in use, as I am certain that it will get very rusted if left unused for long.

A little rock excavation has to be done at the outlet at Long Bay. The contractors are doing this.

The work in this contract, generally, has been faithfully carried out, and is, I think, a credit to everyone concerned.

Attached is the certificate of the satisfactory condition of the streets, from the Borough Council, North Sydney.

The maintenance time for this work expires 10th October, 1894.

J. W. T. BOYS.  
That

That is under date of 29th November. It is a report notifying the completion of the contract; but the date on which the cash deposit was returned to Carter, Gummow, & Co., was the 19th June previous. It will be seen from page 328 of the Parliamentary return, that on 19th June Mr. Barling wrote the following letter:—

Gentlemen,

Department of Public Works, Sydney, 19 June, 1894.

I am directed to inform you that the Secretary for Public Works has approved of the return to you of the Bank fixed deposit receipt for £2,000, held as security for the due performance of your contract for the construction of the main outfall sewer, North Sydney, on condition that you lodge security to the extent of £650, in respect of the works in extension of the contract referred to.

I have, &c.,

J. BARLING,

(*Per* D.C.M'L.),

Under Secretary.

Now, £650 had been already lodged upon an entirely different contract. It had been lodged upon Contract 79A just about that time; so that, practically, by the return of that cash deposit, which was recommended by Mr. Hickson on the 13th June, 1894, six days before the date of the Under Secretary's letter, supposing any portion of Contract 79 had collapsed, or anything had gone wrong with it, there would have been nothing upon which the Government could come with which to remedy the state of the works. What is object of taking a bond at all, if the money is to be returned in that manner? As to the retention money, it will be seen from Mr. Christie's evidence that it was returned in such a manner as to leave very little upon the contract—I think it was a matter of some £220 over and above the money which was paid upon the voucher. At all events there was very little money left with which to complete the contract in case anything had occurred to jeopardise the interests of the State. I would point out that the specification says most distinctly that advances "may" be made. I do not pretend to have any legal knowledge or experience, but I submit that the bond which appears upon page 71 is really useless. It gives the Minister the right to make advances at a certain percentage to these contractors upon their material. Now this is not a bill of sale. It is only an undertaking to give a bill of sale upon this material supposing the material is not on the premises—that is, away upon some private property, as was shown to be the case upon one of these contracts. Then it might at any time be seized by the creditors of the contractor and removed. I do not think the State would have any control over that material upon a mere agreement of that sort executed with the contractors. The advances were made, not at the rate of 75 per cent.—for, if your Honor refers to Mr. Christie's evidence upon page 296, you will see that advances were made upon cement at the rate of 16s. per cask, purchase value. Cement at that time, as the Department must have known—being acquainted with the market,—was only at the value of from 11s. to 12s. There was therefore, no justification for the making of advances upon it at the rate of 16s. They took the schedule, and Carter, Gummow, & Co. were asked to put down a price for some odd casks,—some casual casks, which they would have to deliver close to the time when the works were completed, or after they were practically completed. They put down these special casks at the rate of 16s., and upon that the Government considered that they were bound to advance at the rate of 16s. That is totally absurd. They had no right under that agreement to advance more than 75 per cent. upon the actual market value of the material. I do not think the Department can show that in any other case they gave such a concession to other contractors as they have given to Carter, Gummow, & Co. The concessions practically amount to this—that they financed the firm right through their contracts. The Government are not called upon, as I pointed out in the first instance, to finance contractors. They are supposed to have contractors of sufficient credit and financial standing carrying out their works to obviate the necessity for any measures of that kind. Otherwise, the Department might just as well dispense with contractors and carry out their works themselves, finding their own labour, and financing matters right through. While dealing with this point, I should like to refer to the evidence of Mr. Gummow. He was called to show that a similar course had been adopted by the South Australian Government; but your Honor, on looking at his evidence, will see that he admitted that the South Australian Government did not return the cash deposit. He said that the firm received back a portion of the retention money there, but that the deposit of £5,000 had been retained to this day. It will be retained until the expiry of the term of maintenance—that is, until the Crown considers that sufficient time has elapsed to permit of their taking over the contract with safety. Prior to the advances being made in this Colony there can be no doubt there was no Ministerial sanction obtained. Mr. Davis has directed your Honor's attention to a minute by Mr. Bruce Smith. I may point out that in Mr. Christie's evidence, upon page 382, it is shown that an item of £1,000 was advanced out of the retention money upon the 23rd October, 1894, upon certificate No. 8—that is, in respect of Contract 69. There was at that period £23,159 worth of work to be completed upon the contract, showing that the Department were only too ready to return this retention money at a period when there was really no justification whatever for that step. There might be some justification for it towards the close of the contract, but there was certainly no justification when one half of the contract had to be completed. It might be pointed out that this was under a new system where the retention

retention money was not accumulating, but where it only arrived at the extent of the deposit. It was at that time limited, and there would therefore have been £1,000 less. In reference to this same contract, No. 69, it may be remembered by your Honor that two sureties were taken, Mr. Henty, of Parbury, Henty, & Co., and Mr. Scrutton, of Scrutton & Co. Mr. Davis wrote a minute, under date of 21st September, 1894, upon the following letter by Messrs. Carter & Co. to the Engineer-in-chief for Sewerage:—

Contract No. 69, Western Suburbs Sewerage.

Sir,

North Sydney, 20 September, 1894.

Having now completed a considerable portion of the above contract, for the performance of which your department hold security to the extent of about £6,800, being £4,500 as guaranteed by our sureties and £2,300 retention money for work already done, we have the honor to ask you to allow the payment to us of £1,000 from the latter amount, leaving £5,800 still remaining as security for the due fulfilment of the remaining portion of the work.

We would remind you that our sureties are two of the most reliable firms in the city, viz., Parbury, Henty, & Co., Pitt-street, and R. L. Scrutton & Co., Clarence-street; and also that the amount of security required had the contract been accepted in the ordinary way would not have exceeded £4,500.

We have, &c.,

CARTER, GUMMOW, & CO.

As a matter of fact, the securities were not the firms, but the individual members of the firms. In any case, the money was returned, and, although it is not admitted by the department, I have always been led to consider, in private practice, that if any infringement be made upon a contract, the bondsmen, if they have not been notified of the intention to make a payment or give concessions not provided for in the contract, are legally free of the bond into which they have entered. The question is not whether Mr. Henty and Mr. Scrutton would take a point like that. The point still exists, and I contend that in the case of a public contract such risks as are disclosed to have existed in this matter ought not to have existed. Unless these contractors were financially strong, they ought not to have had these concessions, and the very fact of their asking at such an early period for a return of the retention money ought to have satisfied the department that they ought to have looked more carefully into the way in which they were paying away money to them, so that the State might be in a perfectly safe position upon the final completion of the work. There is one matter with which I should like to deal at this stage, and that is the connection of Mr. Hickson, jun., with the firm of Carter, Gummow, & Co. Originally, from information which I received, I felt convinced that young Mr. Hickson was a member of the firm. Of course the evidence which has come before the Committee has shown distinctly that he was not a member of the firm. At the same time the evidence tendered reads very curiously, and I intend to place before your Honor, grouped together, the testimony of various witnesses upon this point. Let us take, first of all, the evidence of Mr. Ewing:—

3280. Sometime in June, 1895, I believe you had a conversation with Mr. Carter near the Bank of New Zealand? Yes.

3281. What did Mr. Carter tell you? Mr. Maddison asked Mr. Carter if it were true that Mr. Hickson, jun., had been engaged by the firm, and Mr. Carter said "Yes." Mr. Hickson, he said, wanted to join the firm, but he had told him that he had better wait two or three years.

3282. Join in what capacity, or how? Mr. Carter simply said that Mr. Hickson wanted to join the firm, but that he could not do so for some years, although he would be taken on as an employee.

Mr. Maddison, when he came before your Honor, gave this evidence:—

3406. Will you tell His Honor what it was? It amounted to this—that Mr. Hickson, jun., had been retrenched out of the department, and that Mr. Hickson, sen., wished to find him employment of some sort, and had asked Mr. Carter if he could find anything for him to do, or whether they would take him in as a member of the firm. The reply which I understood Mr. Carter made to that request was that Mr. Hickson, jun., could not be taken into the firm within five or six years.

Then later on he said:—

3415. Later on Mr. Gillan, one of the members of the partnership, came up to Sydney from Adelaide, did he not? Yes; some considerable time afterwards.

3416. And you, in company with Mr. Ewing, had a conversation with him? Yes; we were talking about things in general.

3417. What did he say? He said he had seen a wire which had come from Sydney to this effect—that Mr. Hickson, sen., wanted his son taken into the firm.

3418. Did that part of the conversation go any further? No.

I come now to Mr. Carter's evidence.

3914. As to the matter of Mr. Hickson, junr., becoming a partner, did you ever suggest that he was to become a partner? No.

3915.

3915. Did you ever hold out any encouragement to him to believe that he might one day become a partner? Not the slightest.

3916. Did you not, on the other hand, damp him, as it were,—instead of encouraging him, did you not rather discourage him? Certainly I did. As far as I can remember the matter only cropped up once between us conversationally, and then I sat upon him, as it were.

3917. *His Honor.*] When and where was that? During his trip here. When he was on his holidays I believe. He was always anxious to better himself, I presume. We had seven partners in the business, and I thought that quite enough.

Take now Mr. Gummow's evidence:—

4213. Between yourself and Mr. Hickson was there ever any conversation as to his becoming a member of the firm? Yes.

4214. Will you tell His Honor what it was and where it took place? I can tell you the first one we had on the subject. He was often staying at my house in Adelaide, sometimes for a few days, sometimes for a night, and sometimes for an hour or two. We often talked about business and about all sorts of subjects. I can tell you the last conversation we had upon the matter to which you refer; that took place at Forest Lodge. With regard to the other conversations, I always told him that I did not consider that there was any chance for a young fellow going into contracting either with our firm or with any other firm, and that if he could keep his position as an employee he would be far better off.

He also gave this evidence:—

4201. Was there ever any intention on the part of the firm of making him a member? Never; not on my part, anyway.

Then look at his reply to Question 4228:—

4228. But where did this particular conversation you are about to refer to take place? I cannot remember. The conversation upon each occasion was upon the same points,—that is, as to how his son was getting on, how he did his work, whether he looked well, and general questions of that sort which a father would naturally ask about his son. I remember that on one of these occasions I said to his father that I did not see much prospect of his son getting on in the outside world as a contractor.

What did Mr. Hickson, junr., himself say?

3576. You never had a conversation of any kind with them as to your becoming a partner in the firm? Not seriously; but such a lot of things are said which one cannot remember.

3577. You did not converse with any member of the firm about your being a member of it? No, never.

3578. You are positive of that? I am, on my oath.

Later on he said:—

3713. Did you receive any bonus from the firm? No.

3714. Did you get your expenses from the firm when you went to Adelaide? Going down and coming back I got my expenses.

3715. What did they amount to? About £15.

3716. Besides that £15, or thereabouts, did you ever get anything from the firm in addition to your salary? Not a penny that I can think of.

3717. Is it not a fact that when you went in to Adelaide on the firm's business you paid your own expenses, and never charged them to the firm? Frequently.

3718. How far were the works from Adelaide? Eighteen miles.

3719. Do you consider that the firm paid you a huge price for your expenses? I received none at all for going in to the city from the works.

3720. Were you a loser or a gainer from the visits you made to the city on behalf of the firm? I was decidedly a loser.

3721. *Mr. Smith.*] I think you told Mr. Parkes that you stayed with your father for several weeks when you came from Adelaide in July, 1895? Yes.

3722. Where did you go after that? To Forest Lodge.

3723. To lodgings? Yes.

3724. You were staying with your father then only while you were looking for lodgings? Yes.

3725. I think you said that when you were in the department you did not get anything above your pay? I received an allowance.

3726. What did it amount to? 2s. a day.



3727. *His Honor.*] What was that supposed to cover? It was a travelling allowance to cover train and tram fares.

3728. *Mr. Smith.*] I think you said your salary was £200 when you were in the department? Yes.

3729. *His Honor.*] When was your salary from the firm raised to £250? I cannot quite remember; but I think at Christmas, 1893.

3730. You say you never had any conversation with any member of the firm as to a partnership? No.

3731. Was any hint ever dropped, or any suggestion ever made, that you should enter into a partnership? Well, I suppose such a thing may have been mentioned, but there was never any agreement or any definite arrangement of any kind made.

3732. What sorts of hints or suggestions were made? I often expressed a wish, I believe, to become a member of the firm.

3733. And what would be said by the persons to whom you expressed such a wish? They never gave me any hope at all.

3734. The question was mooted only in a general way? Only in a general way.

3735. At what time would that be? I could not give you any idea.

3736. Was it soon after you went to Adelaide, or was it before you entered the service of the firm? I could not say. It was never really discussed at all.

3737. What I understand you to say is that a hint was dropped by you that it would be a good thing for you if you were to become a partner; is that it? I do not know how to put it. I never asked them to take me into the firm, and they never asked me to join it.

3738. Then in what sort of way was the matter mooted? I cannot exactly say. Nothing was mentioned concerning it with any degree of finality. No hope was held out to me that I should become a partner.

3739. But did you say to any member of the firm that you would like to become a partner? No; I think I never said that.

3740. Did you suggest that, as you were an expert, it might be to the advantage of the partnership that you should become a partner? No.

3741. But some hint of the kind was dropped, I understand? I thought I should be bettering myself if I could become a partner, but nothing of a definite character in any shape or form was ever said.

3742. What I want to arrive at is, what it was that was indefinitely said? I cannot remember.

3743. But whatever did occur occurred in South Australia? Yes. I saw Mr. Gummow privately just as often as I saw him officially, and we talked about various things—about other firms and matters of interest.

3744. And in the course of these conversations did you drop hints to him that you would like to be a partner of the firm? Yes; but in a purely private way.

I will now take some more passages in the evidence of Mr. Carter.

2919. *Mr. Parkes.*] Did you ever have any communication in any way, verbally or written, with Mr. Hickson, senr., concerning the appointment of his son? No.

3920. Had you not any at the time of his appointment? No.

Let me now refer your Honor to the evidence of Mr. Hickson, senr., upon page 562:—

I then went down to Mr. Lyne, the Minister; and he said the report had not come to him, but that if I had the least hesitation in my mind in regard to my son he would not allow it to go any further. I said I had made up my mind what I would do, and that I would adhere to my determination. The next morning my son came to me and said he had accepted an offer to go to Adelaide with Carter, Gummow, & Co. Mr. Carter happened to be in the office that morning, and I sent for him. I said "Is it true that you have a position for my son in Adelaide?" He said "Yes." I said "There is no mistake about it; you want someone?" He said his partner in Adelaide wanted an assistant, and that if he did not get this young man he would get someone else. He went on to state what he proposed to pay him. I stopped him at once, and I said "He is now your employee. You are offering to give him what he is worth, in your opinion, and it is nothing to me one way or the other."

It would appear, therefore, that a conversation really did take place, and the whole thing, as far as this matter is concerned, is wrapped in a considerable amount of mystery. Now I received certain information concerning young Mr. Hickson and his connection with the firm, and it would have been absolutely impossible for me to get at the truth or otherwise of that information without the most exacting inquiry.

I knew that well, and I asked Mr. Maddison and Mr. Ewing, the two gentlemen who gave me the first information upon which I spoke in the Legislative Assembly, to give me the best method of fixing, without any chance of challenge, the statements they made to me. Mr. Maddison said that he was very friendly with Mr. Gillan, and that he could get a copy of the telegram from him. He said that, if he could not get him to make a copy of the telegram, a copy could be got from the Telegraph Department. That I think I pointed out in my evidence. As far as this particular aspect of the case is concerned, it may be that future developments will throw more light upon it. But, looking at the matter in the light of the evidence which has come before the Commission, or all the evidence that I have been able to produce, I certainly have failed to show that young Mr. Hickson was a partner in the firm. But, even supposing he was a partner in the firm, perhaps it would not be fair to say that Mr. Hickson granted all the concessions which I contend he has granted to Messrs. Carter, Gummow, & Co., over and above the treatment which he has meted out to other contractors, simply from that cause. It has of course been established beyond doubt that young Mr. Hickson was taken into the firm of Carter, Gummow, & Co., as an employee at a time when they had really very little work except the Adelaide contract, where they had two partners who were properly qualified to look thoroughly after the firm's business. We have evidence also that young Mr. Hickson left the firm's employ—and on leaving it he was given three months' advance of salary—at a time when they were expecting to get further Government contracts and just prior to this inquiry. If the firm had not a great number of the Government contracts actually in hand, they had been tendering, no doubt. Tenders were constantly being called for for sewerage work, and there was plenty of money available for carrying it out. The firm, under these circumstances, might naturally have expected to get as much business as they had before. I intend, however, to strike out of my charges, if I can do so at this time, that portion of the clause in which I charged Mr. Hickson with making concessions to Carter, Gummow, & Co. on account of his son—that is, I will amend the clause by striking out the words “his son, George Hickson, being an interested party in the firm of Carter, Gummow, & Co.” I contend that great concessions have been given to this particular firm, but whether it was for that reason or not it would be almost impossible to produce evidence to show. It would not be fair, I think, having regard to the evidence which has been brought forward, for me to allow the portion of the clause to which I have referred to remain. I admit that the evidence in that connection is not strong enough, although I have read to your Honor certain portions which tend to throw a certain amount of mystery over the matter. I would ask your Honor to permit me to amend the clause in the way I have indicated.

*His Honor* : These charges, as you yourself contend, Mr. Parkes, do not bind you in any way to the proof of them ; nor do they limit the inquiry which the Commission has a right to make, because if it should appear that there was evidence to support anything which is not absolutely contained in these charges the Commission would still have to receive it and to inquire into the matter referred to. Therefore, although it is quite right that it should appear in the course of your address that you express the opinion you have expressed, it would only complicate matters unnecessarily, I think, to actually strike the words out of the charge now, because they would have to appear as part of the history of the case—as having at one time been formulated. It is not so much that charges have been made, I take it, as that your opinions have been formulated.

*Mr. Parkes* : I listened, your Honor, very attentively to that portion of Mr. Smith's address in which he charged me with acting with very slight and poor consideration in laying these charges. It is almost impossible to lay a charge without putting it in words which will mean that which you think the evidence will prove. I thought there was really something in Mr. Smith's remarks to the effect that there was an intention on my part to cause harm to Mr. Hickson by laying charges in the way I did. It is only a matter of sentiment, and I wished to eliminate the words to which I have referred purely on that ground.

*His Honor* : If you wish it, Mr. Parkes, a footnote could be added to the minutes showing that, at a certain date, you wished to withdraw the words to which you have referred.

*Mr. Parkes* : With reference to this matter I have said that future developments may bring forth the truth one way or the other, but it must be apparent to anyone, from the evidence which has been given, that there was an effort on the part of young Mr. Hickson to become a partner of the firm, and that there was certainly some conversation among the parties concerned as to whether it was proper that he should become a member, whether it was to their interest or his interest that he should become a member of the firm or not. It would be almost impossible, without adopting a course which I have been very careful not to adopt during this inquiry ; without going to the extreme of playing the part of a detective, with agents here and there, seeking for information—that I scrupulously avoided during this inquiry—to set this matter at rest. The reason I asked for the Bank-books was simply in order that a complete search might be made through them—a search as complete as it was possible to make with the data we had—so that your Honor might judge whether the rumours which were circulated about town, and which were put into a definite form by the two retiring partners, had or had not any foundation  
of

of truth. I have so far omitted to make reference to a little matter in regard to the introduction of the Monier patent. I have left it as a little subject incidental to the inquiry to be dealt with by itself. I refer to the construction of the Monier culvert at Strathfield. Now, most remarkable evidence has been brought before your Honor in connection with that culvert; and I think you ought to take cognisance of it in so far as it relates to the method in which Parliamentary votes are expended in connection with these works, and also as to the method in which the accounts of the department are kept and returns are made to the Auditor-General.

*His Honor*: You must remember, Mr. Parkes, that they are matters which are outside of my cognisance, unless they, in some way, come in as material evidence to prove the charges, or are material to the questions with which the Commission has to deal. Of themselves, they are altogether outside the scope of the inquiry.

*Mr. Parkes*: I might point out that the Monier culvert which was built at Strathfield must come under your Honor's cognisance in so far as it is connected with one of the charges which I have placed before you bearing upon the first introduction of this patent into the department. Other matters have also come under your Honor's cognisance in the same way—in that they had to do with the cost of the work and the manner in which it was carried out; that being the basis upon which a certain report was made to the Minister.

*His Honor*: The matter, I can see, is involved in this way—that the more the work cost the more justification would there be for putting a high price upon Contract 77, and the less it cost the more justification would there be for introducing the system.

*Mr. Parkes*: I contend that the culvert afforded no guide at all as to the cost of the work. Mr. Barling, for instance, was questioned as to whether the cost of a culvert of this nature was sufficient to justify Mr. Hickson in making the report he did to the Minister, and he gave this evidence:—

7437. According to Mr. W. A. Smith, only one-half of the culvert was completed when Mr. Hickson wrote this letter to the Secretary for Public Works:—"The Monier system of concrete arching has been patented in the Colony by Messrs. Carter & Co. Where applicable, it reduces the cost of spanning an opening by about 50 per cent. The patentees are willing to allow the department to use the patent on payment of a royalty of 15 per cent. on the cost of the arch. I recommend this for the Minister's approval. I might state, I have just completed, with the permission of the patentees, a culvert on the Parramatta Road built on this principle, with most satisfactory results financially and otherwise;"—do you think that the building of that culvert was sufficient justification for the Minister's entering into an undertaking like this? I do not think it was sufficient standing alone, but Mr. Hickson explained, when recommending the patent, that it had been tried in Europe and elsewhere. I remember his showing either to the Tender Board or to myself—I think it was to the Board—a number of photographs of bridges of considerable size in the construction of which the principle had been used with great success. As to one of your preceding questions, I can quite understand how it was Mr. Hickson was not prepared to recommend the purchase of the patent for £1,500 then, but subsequent information may have convinced him that it was a desirable thing to try.

What I want to point out is this—that, according to Mr. Barling's statement, there was not sufficient justification for Mr. Hickson's recommendation. The Monier arch at Strathfield was built in connection with a culvert, and a lot of work would have to be done to create a culvert in the first instance. Mr. Symonds, the officer in charge of the road, sent in to the department, as his evidence clearly shows, a report to the effect that the only culvert required at this point to take away the limited quantity of water would be a few earthenware pipes, costing, approximately £110. In Mr. Symond's opinion a brick barrel drain of 2 feet diameter would have sufficed, but the department set to work and created a Monier culvert, spanning a distance of about 5 feet. It will be easily seen that the culvert was one which would have to be built while traffic was going on, and the work would therefore be of a small, finicky nature, and there would be an extravagant expenditure for labour, as is proved by the documents which have been handed in—that is, vouchers in connection with the work—and by the payments of Mr. Symonds, who was in charge of the work, and who made a record of all the disbursements. These records show that the expenditure upon the work was of an extravagant nature, and that it afforded no precedent upon which the department could go in suggesting that the system would render works in connection with which it could be used 50 per cent. cheaper. That might be the case in a large work where the contractors would have the means of carrying it out in a proper fashion. It might be in such a case a cheaper system; it undoubtedly is, as figures which have been submitted to your Honor have conclusively shown. But it has been shown, in connection with the construction of this culvert, that there was no intention of trying to economise

economise or to find out whether the system was economical or not. The only object seems to have been to obtain the introduction of this patent into the Public Service. It is a significant thing that Mr. Baltzer—as he admitted in his evidence—was watching the operations, that Carter & Co., according to the vouchers, were supplying the cement, and that the greatest interest was being taken in the culvert—certainly not, however, from the point of view of making the system appear economical. There was, therefore, nothing to justify Mr. Hickson in writing his minute, apart from the statements which had been laid before him in Mr. Bagge's report, or by Mr. Bagge or Mr. Baltzer or any other officer of the department in conversation, and from his reading of pamphlets and things of that sort. However, he points to this expensive culvert in his minute as an illustration. The original papers show, in the first place, that the offer of the patent was written on the 2nd July, 1894, by Mr. Carter, in the Public Works Department, when the construction was only about half way through. It was impossible to tell upon the 18th July, when Mr. Hickson wrote his minute, what the real cost of the work would be. Yet he said in his minute :

The Monier system of concrete arching has been patented in the Colony by Messrs. Carter & Co  
Where applicable, it reduces the cost of spanning an opening by about 50 per cent.

The patentees are willing to allow the Department to use the patent on payment of a royalty of 15 per cent. on the cost of the arch. I recommend this for the Minister's approval.

I might state I have just completed (with the permission of the patentees) a culvert on the Parramatta Road, built on this principle, with most satisfactory results, financially and otherwise.

Now, how was he to judge whether, taking that culvert as an illustration, the system was satisfactory financially and otherwise. Mr. W. H. Smith, in his evidence upon page 169, said :—

6307. Was the portion of the arch which the heavily laden dray went over completed on 2nd July? I could not say.

6308. When did you start the work? Somewhere about the end of June. I do not remember the exact date. The only way in which I have been able to arrive at all has been by turning up my diary, from which I see that I visited the place every second or third day from the 25th June to the 24th July.

The work was not completed on the 24th July, and yet, on the 18th July, Mr. Hickson wrote the minute which I have quoted. I contend that you cannot make a comparison of the system founded upon works in two different positions, and for totally different purposes. The only way in which you can make it is by having regard to the exact materials, taking the true cost of the materials and of the labour expended upon them, and letting each work stand upon its own basis. There was not sufficient experience gained in the construction of this small culvert to justify the department in forming an opinion that the work would be cheaper. Mr. Hickson could well have understood that, and, if he wanted to genuinely recommend the use of this patent in the department, he ought to have selected some bridge in the Colony for its trial, and have made the contractors, at cost price or with only a little profit, convince him, by the application of the system to a work of that importance, that it really was cheaper than the ordinary method of construction adopted by the department, also that it was more substantial than the ordinary method of construction. There cannot be the slightest doubt but that the system is cheaper, and, although Mr. Symonds' evidence has gone to show that the culvert was in this case more costly than the ordinary method of construction—that is absolutely proved by producing the vouchers signed by Mr. Smith—still that would not be the rule. It was also shown that Mr. Smith's evidence was entirely wrong so far as his estimate of the cost of the work went, and there can be no doubt that if the work had been carried out with less messing about and less waste of time and material it would have disclosed a much better result from an economic standpoint. I admit that it would have been cheaper, but, taking the data which Mr. Hickson had before him at that time, my contention is that Mr. Hickson was not justified, unless he wished to make a concession to these contractors, in writing that minute to Mr. Young, upon which he agreed that Carter & Co. were to obtain a royalty of 15 per cent. for the use of the Monier patent wherever the department desired to use it.

*Mr. Davis* : May I be permitted to point out the evidence which Mr. Smith gave upon page 170, Mr. Parkes directed your Honor's attention only to the statements of Mr. Smith upon page 169.

*His Honor* : I shall of course have to go through the whole of the evidence myself, although of all the confused pieces of contradiction which I have come across, the Smith, Bryant, and Symonds, tangle is one of the worst. It would be very hard to arrive at the cost of the culvert from the evidence which has been tendered to the Commission.

*Mr. Parkes* : I submit that it would be simply impossible to do so, your Honor. I come now to Mr. McSweeney's evidence, upon page 51. When Mr. Hickson was giving his evidence I handed to him a letter or minute in regard to Contract 112, and at the tail end of the minute, as your Honor may recollect,

recollect, there was a paragraph stating that the whole of the responsibility for the payment of the 15 per cent. upon the Monier system was thrown upon the shoulders of the contractors. Mr. Hickson, upon page 90, gave this evidence :—

3213. When you submitted the tenders to the Tender Board you knew that the patentees would make a claim? Yes.

3214. Before the contract was let? Yes.

3215. Then why did you not before letting the contract take the Monier plates out—why did you wait until Mr. M'Sweeney made his protest before you took them out? The few plates were not worth speaking of. They were a very small portion of the job.

3216. *His Honor.*] I understood one of your answers just now to have reference to the iron bars in the carriers? Yes; that is another matter.

3217. *Mr. Parkes.*] They do not belong to the Monier system, you say? No.

When Mr. Carter was being examined I asked him if he intended to make a claim upon Mr. M'Sweeney for the application of the Monier system to the carrier in Contract 112, and he said he would see about it when the work was completed. There can be no doubt about this—that there has been a great effort on the part of Mr. Hickson himself—who has shown great friendliness towards Carter & Co. in obtaining a good position for their patent—to introduce the patent into public works generally. Mr. Hickson, upon page 34, said :—

1272. And you recommended that 15 per cent. should be paid upon the cost of it? Yes.

1273. Carter & Co., on 2nd February, 1894, wrote a letter upon your own office paper undertaking to accept that? Yes.

1274. And it was accepted? Yes.

1275. And the contract is now entered into? There is really nothing at all in what you are speaking of which applies to this particular contract. This was a general approval which I obtained wherever I thought it advisable to apply the system to the road bridges of the Colony. As a matter of fact, it has not yet been so applied, except in the case of one small bridge on the Parramatta Road.

1276. As a matter of fact, have not Carter & Co. a legal right to get this percentage upon all work of the kind done by the department? On any work we did of the kind most unquestionably.

I would ask your Honor to turn also to Mr. Hickson's evidence upon page 563 :—

17076. They say, in their letter, "Referring to our conversation"? I suppose that refers to the statement of the fact that they had taken out the patent. I do not know that they mentioned what percentage they would ask until the letter was written.

17077. It would appear from the letter that it was sent on to Mr. W. A. Smith, the engineer? Yes.

17078. So that the conversation therein referred to would probably be a conversation with Mr. Smith, but not with you? The conversation referred to would no doubt be with Mr. Smith. The only conversation they had with me related, as I say, to the statement of the fact that they had patented the thing.

17079. And upon that you wrote your minute of 18th July? Yes.

17080. In that minute you state that the patentees are willing to allow the department to use the patent upon payment of a royalty of 15 per cent. on the cost of the arch? Yes.

17081. And you recommend that for the Minister's approval? Yes.

17082. At that time you had had a report from Mr. Smith as to the Parramatta Road culvert? Yes.

17083. At all events the work was far enough advanced to enable you to form a good opinion as to the nature and cost of it? Yes; and there was also my reading as to the Monier arch system generally.

17084. But you never induced the Minister to enter into an agreement to adopt this patent;—you never wrote any minute inducing the Minister to enter into an agreement with the firm? The minute you have quoted is the only minute I wrote, and there is nothing in that, because it was never acted upon.

17085. That was only obtaining the authority of the Minister to use the patent, whenever it might be thought advisable to do so, at a certain rate? Yes; in cases where it might be thought expedient.

17086. But there was no binding agreement between the department and the contractors as to the adoption of the patent? No.

17087. The matter was still left entirely at large as to whether you would use the patent on any particular work or not? Yes.

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There is no doubt that there was a binding obligation to pay the 15 per cent., and my contention is that on a better trial, and with competition with other patents which exist, a much greater advantage could have been obtained for the State. For instance, in the report which Mr. Bagge made during the time Contract 112 was being planned, several other similar patents were gone into. If the Monier work was to be at the cost put down for Contract 77, then it was proved that the system used in Contract 112, an equally substantial work, and built in a very careful manner by Mr. M'Sweeney, would cost infinitely less. As to the stability of this system, time alone can prove that. We have had evidence as to the contraction and expansion of cement. No doubt a great part of that evidence is true. There is no stability in cement even after it has set; there are movements from expansion and contraction and from other causes. It is a risky thing at all times to use artificial constructions which are dependent upon the blending of cement, sand, and metal. Only time can tell whether this work will stand. But, supposing it to be the very best construction in the world, flaws will probably be found in it which would not be found in stone or in brick structures. Some flaw may develop at any time which would prove ruinous to the whole structure. Time alone can prove whether the structure is a good one or not, and the risk involved depends altogether upon the sureties. The position in which the State will find itself hereafter will depend entirely upon them, and virtually they are the contractors alone. What I want to impress upon your Honor is that in the limited test of the system upon the culvert at Strathfield, and in the photographs and notes which were put before Mr. Hickson, there was not sufficient to justify him, unless he had had a most friendly feeling towards these contractors, in obtaining for them the great concession he obtained by getting into his own hands power to obtain the general adoption of the system in public works throughout the Colony. Before I bring my remarks to a close, I wish to refer to the charge I made to the effect that papers were not fully and properly produced for Parliament. Mr. Davis has attempted to explain that matter away by saying that in producing the papers he took cognisance of what the printing would cost. Now, when Parliament passes a resolution ordering the production of certain papers, it does not absolutely order them to be printed, and Mr. Davis was not justified in exercising this discretion after Parliament had passed a resolution for the production of these papers. The papers for which I moved were, "All papers and correspondence in connection with certain contracts," and the papers most material to the question of the letting of Contract 79 were those which bore upon the claim which existed in connection with Contract 72. Now, so much did Mr. Davis recognise that those documents ought to be produced that, in making up the papers for Parliament, he said he put in certain documents concerning the claim. Why at that time did he not put in the whole of the documents concerning Contract 72? I contend that the order of Parliament was so clear as to leave Mr. Davis without any discretion in the elimination of papers. The order was to the effect that all papers referring to the contract enumerated should be laid upon the Table of the House. The object of laying them upon the Table was not that they might be printed, but that they might be perused by Honorable Members. If the Minister chooses afterwards to submit a motion that the papers be printed, that is another matter. The House need not agree to the motion. The papers are merely put upon the Table for the perusal of Honorable Members. That is the only circumstance which Mr. Davis would have taken into consideration. There can be no question but that every paper in connection with these contracts should have been put upon the Table in compliance with the terms of the Assembly's order. No matter how remotely papers were connected with these contracts they ought to have been put upon the Table. To say that the papers concerning Contract 77, as to the schedule drawn up by Mr. Griffiths, setting forth the payments upon the work, and the papers concerning the first introduction of the Monier system upon the Strathfield culvert—documents which were registered—were not to be produced, because they were in another department, is only begging the question. A most complete record is kept. There is a register showing what papers exist and where they are, giving every particular concerning them—whether they are out or whether they have been returned. That these papers could be found from the register there is not the slightest doubt. The first thing an officer of the department would do, in producing papers, would be to look through the register and see exactly what papers were connected with each case. He would then collect the papers with a view to their being laid upon the Table of the House. The papers in connection with Contract 72 were very important. They were absolutely essential, and my complaint is that they were not laid upon the Table with the other papers.

*His Honor* : I do not wish to be under a misapprehension, but the practice I understand is that, although the order for the printing of papers is generally made after the papers have been laid upon the Table, as a matter of fact in some cases the papers are all printed when they are laid upon the Table. I understand that in some cases that practice is followed. I do not know if it has been followed in this instance. In many cases the documents which are perused by Hon. Members are really the printed papers, not the original documents.

*Mr. Parkes* : The documents are not supposed to be printed except upon a subsequent order of the House.

*His Honor* : Does it not sometimes happen that the papers are first printed and that the order of the House for the printing afterwards follows.

*Mr. Parkes* : No, the course taken is this : the House calls for certain papers, and when those papers are produced by the Minister he submits a motion for the printing of them. That motion may be defeated, and in that case the papers would simply remain upon the Table for the perusal of Hon. Members. The only object in printing the papers is to secure their perusal by Hon. Members. As a matter of fact the mere printing of them often defeats the object of the Member who wishes them produced, and it sometimes happens that he himself opposes the motion to print them. Printing, I think, is never done before a motion for printing is submitted by the Minister. I doubt whether it can be done until that motion has been made.

*His Honor* : What I have assumed to have been done in this case was this : that the papers were sent from the office to the Government Printing Office, and that a printed copy of them was laid upon the Table of the Legislative Assembly.

*Mr. Parkes* : That is not so, your Honor. It will be seen from the evidence of Mr. Barling himself that the original papers were hurriedly sent up to the Legislative Assembly. It is clear from what he said that the original papers were laid upon the Table. As a matter of fact, I remember that they formed a very bulky parcel and that Mr. Young moved that they be printed. That order, I believe, was made on 22nd October, 1895. The papers then went away to the Government Printer, and they were not returned in printed form to the House until 2nd February, 1896,—that is to say, the printed document was not in the hands of Hon. Members until that date. My motion was for “copies” of the papers, but the Department laid the originals upon the Table. In some cases the order is made for original papers, but in this case I asked only for “copies.” All the papers in connection with Contract 77, for instance, were asked for ; but many papers, which have since appeared in the portfolio of that contract, were not included. Take also the papers in connection with Contract 118. That is another contract to which my motion referred ; but the papers produced were limited, as your Honor will see, to the specification, the schedules, and payments. The whole of the correspondence was not put before Parliament. I contend that the department had no discretion at all in this matter. Then, again, one half of the papers in connection with Contracts 79 and 79A which have appeared in the portfolios were not submitted to Parliament, many of them being necessary to connect the information which was contained in the return. Here, again, I submit that all the papers should have been included. In all probability the House would not have voted for the printing of the papers had the Minister explained the bulky nature of the contract papers and correspondence. The Minister submitted the resolution for the printing of the papers in a hurried fashion, however, and the House made the order. The question of printing should not have entered at all into the minds of the officers who prepared these papers for Parliament. The simple order given was that “copies” of the papers be produced, and I submit that every paper should have been so produced. I wish now to deal with Mr. Davis’s memoranda and the manner in which they were submitted to your Honor. In the first place I would draw your Honor’s attention to the memorandum which appears upon page 496, dealing with Contract 69, under the heading of “speculative tenders.” Your Honor will see that in submitting these varying prices placed on certain material by various contractors, Mr. Davis does not in any way touch upon the question of Carter & Co.’s schedule. These are varying prices genuinely taken out by these contractors. The question which alone is involved in Mr. Carter’s tender is that a deliberate attempt was made to obtain concessions which should not have been granted. Mr. Thompson’s memorandum to your Honor will show the items eliminated and the total of them in each tender, as well as the items which were used in the carrying out of the contract. Your Honor will see from Mr. Thompson’s figures that Messrs. Carter, Gummow, & Co. were far below the cost of these other contractors ; and the fairest way of dealing with the matter is to take these items together, and to properly proportion them ; to see what advantage would be got by the picking out of various items here and there. Mr. Davis’s memorandum is no answer to the charge that Messrs. Carter & Co.’s tender for Contract 69 should not have been accepted. As I have pointed out to your Honor there is an inconsistency in the allegations as to the time at which the new schedule came into operation. However, the greatest exception which I take to these memoranda is the incomplete manner in which they have been submitted, and the want of documentary evidence to sustain them. I have been careful to place at the back of the oral evidence which I have placed before your Honor documentary evidence ; and I think that in memoranda such as these Mr. Davis should have taken the same course. I will take one memorandum—that which deals with the cement. The reply of Mr. Davis to that charge of mine that a deficient quantity of cement was allowed to be used is contained upon page 631. Mr. Davis makes up his calculations as to the quantity of cement supplied upon Contracts 69, 79, and 79A, by stating that he accepts the quantity of 13,432 barrels purchased, and he adds to that the stock delivered from Contract 72. Now, Mr. Davis, taking the journal of Contract 72, must have known, because he initialled the information in it —

*Mr.*



*Mr. Davis* : I may say that I had not seen that journal until it was found yesterday. I proposed to ask Mr. Boys about it. Moreover, that journal, I submit, your Honor, is not in evidence.

*His Honor* : It is in evidence now ; but it did not, in point of fact, turn up until yesterday morning.

*Mr. Parkes* : There is the fact in black and white. Mr. Davis initialled these entries as correct—for instance, he initialled as correct the entry made on December 5th, 1891, to the effect that the inspector found that there were only 1,689 barrels of cement stored in the sheds, viz., 300 Alsen, 958 Camel, and 431 Germania. That was in December, 1891. I should like Mr. Davis to point out the item to which he refers.

*Mr. Davis* : If you look through the journal you will see that there are 2,000 casks independently of that quantity altogether.

*Mr. Parkes* : I see that Mr. Boys says it was reported that there were 2,200.

*Mr. Davis* : My contention is that the journal shows clearly that, in addition to the 1,689 barrels to which you have referred, there were a further 2,000 barrels, making a total of 3,689 barrels.

*Mr. Parkes* : Where is the report as to the 2,000 barrels ?

*Mr. Davis* : It is in the journal.

*Mr. Parkes* : There is an entry under the date of 16th November :—"The contractors have stored on the works 2,000 barrels of cement, samples of which they desire tested. The cement is not required." Then, on 5th December, Mr. Boys says it was reported that there were 2,200 barrels, but that the inspector found that there were only 1,689 barrels in the three sheds.

*Mr. Davis* : That refers to approved cement. There was a fourth shed, and it is evident that in that fourth shed the 2,000 casks were stored. The journal supports *in toto* the position which I have taken up.

*Mr. Parkes* : The work was running at that time, and up till February cement was being used. What I contend is, that Mr. Davis, with these journals before him, and with the journal of Contract 79, upon which contract Mr. Boys was also the engineer, before him, must have seen all the particulars of cement delivered, including the first delivery of cement upon Contract 79. This being so, he ought never to have placed before your Honor the statement that 2,200 barrels were transferred from Contract 72 to Contract 79.

*His Honor* : The evidence is that Mr. Davis had not these journals before him.

*Mr. Davis* : Statements, which have been purely assumptions, have run through the whole of Mr. Parkes's address.

*Mr. Parkes* : I will withdraw this particular statement or assumption. The matter will be cleared up later on, no doubt. What I meant to say was, that Mr. Davis must have had these journals within his knowledge.

*His Honor* : But as to his remembering what he initialled at the time these reports were made, I suppose you would hardly contend, Mr. Parkes, that Mr. Davis could do that.

*Mr. Parkes* : What I contend is, that these memoranda, based upon the evidence—upon evidence such as that of Burcombe—ought not to have been placed before the Commission unless there were good documentary evidence to back them up. I should like your Honor to carefully peruse these various memoranda, which are based only upon mere statements. I will ask your Honor to look into the particulars of each of these statements to see that there has not been an error—an unintentional error—creeping into their compilation. Of course, your Honor will see that with statements such as these, without the production of the documents referred to, it would be almost impossible, without another inquiry, to challenge them. When Mr. Davis refers, for instance, to certain returns of deposits to contractors in the railway and other branches of the Public Works service, the documents relating to them certainly ought to be produced for your Honor's perusal before the statements founded upon them are accepted as absolute evidence.

*Mr. Davis* : They have been produced. They are in the room at the present time. They were produced some time ago for Mr. Parkes's information.

*Mr. Parkes* : Not only in this instance, but in many other instances, reference has been made by the department to documents which are outside of this room. Quite a number of references have been made which ought to have been authenticated by the production of the original documents. I come now, your Honor, to my charges as tabled. As regards Contract 69, my first charge was—

With allowing Messrs. Carter, Gummow, & Co. to manipulate the Department's schedule for Sewerage Contract 69 so as to give the contractors an advantage over the Crown in their contract to build a sewer in Marrickville, by which the contractors were paid upon the extravagant items of charge, and were conceded those items upon which they had a losing price. That

That has been fully proved, I submit, by evidence which has been produced on the subsequent conduct of officers of the Department, after the receipt of the tender of Carter, Gummow, & Co. My second charge in relation to Contract 69 was—

With allowing the contract to be taken up by Carter, Gummow, & Co. with an insufficient bond, and with ultimately breaking that bond by remitting the retention money, and writing a minute by which the Minister was deceived and induced to consent.

I consider, also, that the evidence has been conclusive in respect of that charge. The taking of personal sureties without making inquiry is beyond question. It is admitted, in fact, that no inquiry was made in the case of Mr. Scrutton and Mr. Henty, and, without making inquiry, their names ought not to have been substituted for the principle of a cash deposit, even although the contractors had undertaken to accept payment in Funded Stock. My third charge in relation to this Contract was—

With paying to the contractors large sums of money which they (the Departmental officers) were not compelled to pay under Carter, Gummow, & Co.'s contract with the Crown.

That is also proved, I contend, in that the department continued to pay to Messrs. Carter & Co. an enormous sum of money for bluestone pitchers when they certainly might, with great equity, even to the contractors themselves, have so altered the schedule as to save the Treasury. My fourth charge as to this contract was—

With advancing to the contractors sums of money improperly and in violation of the terms of the contract, and without sufficient security.

Here, again, I contend that, taking the specification, the acts of the department, and the documents which were drawn up, there was not sufficient security for the advances made to the contractors. I contend, further, that it was never contemplated by Parliament, or even by the Minister, that the State should render financial assistance to those who are engaged in the carrying out of public contracts. My fifth charge in relation to Contract 69 was—

With incompetency in carrying out and administering the contract.

That charge is allied with the other charges. Charge No. 6 was—

With failing to comply with the orders of Parliament, and placing documents on the Table of the House in a manner calculated to mislead Honorable Members of the Assembly.

I contend your Honor that, unless the complete documents were forthcoming in connection with these contracts—and the complete documents in connection with Contract 69 were not by a long way laid upon the table—it would be impossible for any Hon. Member to understand the exact nature of the undertakings. The papers are put before Parliament for the perusal of the Hon. Member asking for them, and, of course, for the perusal of other Hon. Members; and an officer of the department has no discretion whatever in picking out those papers which should be included and those papers which should not be included. Charge No. 7 in relation to Contract 69 was—

With allowing defective work to be put in the works, by which a loss is sustained by the Crown.

That charge, I contend, is covered by my general charge with reference to the shortage of cement in these various works. I come now to Contract 72. My first charge under the heading of that contract was as follows :—

With paying away large sums of money to the contractors, Carter, Gummow, & Co., which they (the departmental officers) were not obliged to do under the contract conditions; and with settling a claim without a proper test as to the liability of the Crown for a sum of £4,050 9s. 6d., by obtaining the Minister's consent granting the contractors Contract 79 without re-tendering for that contract, when, in the interest of the Crown, it was the clear duty of the department to do so.

That, I contend, has been clearly proved. Charge 2 in relation to Contract 72 was—

With proceeding with works not contained in the contract, and paying for same out of contract vote; and with using unauthorised, in connection with contract, money voted for other contracts.

That, I contend, has also been done. My third charge in relation to this contract was—

With withholding from the papers laid upon the Table of the House such documents as would allow Honorable Members of Parliament to understand the nature of the contract, and the manner in which it was carried out.

Here again I contend that the evidence shows that this has been done. As to my charge, in connection with Contract 77, relating to the calling of public tenders, the minute issued by Mr. Hickson with regard to the cost of the work, and the minute issued by him with regard to the sureties, I contend that, looking

at

at the evidence which has been produced, there cannot be the slightest doubt but that those minutes deceived the Minister, and that, had they not been written, the Minister would not have acted as he did act. I contend, also, that there was no justification whatever for Mr. Hickson, unless it was to befriend the contractors, writing these minutes. That is clearly shown by the evidence which has been placed before your Honor. My fourth charge in relation to Contract 77 was—

With withholding the proper information concerning the above transaction from Parliament, by not laying plans and other papers upon the Table of the House when ordered to do so by Parliament.

My complaint is that, when the papers were submitted to Parliament, no papers such as have been since produced were forthcoming to show the nature of the Monier arch work—the quantity of work involved in the system, or anything of the sort. As to Contract 79, my first charge was—

With improperly granting to Messrs. Carter, Gummow, & Co., without re-tendering, Contract 79, by which a loss was sustained by the Crown.

I have proved that, I think. As to the second charge—

With allowing Messrs. Carter, Gummow, & Co. to manipulate the items in the schedule prepared by the department, so as to increase the profits of the contractors to the loss of the Crown.

I contend that the evidence sustains that also. Charge No. 3 was—

With returning the cash security and the retention fund to the contractors, in violation of the contract agreement and to the advantage of the contractors, and hazarding the interests of the Crown.

I contend that there was not the slightest justification, as has been shown by the evidence, for this action. Charge No. 4 was—

With the discharging of Inspector Reid from the above contract for simply doing his duty in the interest of the Crown by insisting upon good work and material.

The evidence which has been tendered to the Commission shows conclusively that this man should never have been removed from the contract. From the evidence which has been given, showing the manner in which this contract was carried out, it must be clear to your Honor that a man of Reid's description was necessary to protect the best interests of the country. Charge No. 5 was—

With improperly paying an account of £350 6s. 8d. to the contractors for removing material, which work they never performed.

That charge I desire to withdraw. Charge No. 6 was—

With placing improperly to the account for payments on Contract 79 various items of payments for work done at Bondi.

That is a similar charge ; but I will allow it to stand, because I do not think that any moneys, however small, used upon a certain work, should be returned as having been used upon a work miles away. Charge No. 7 was—

With advancing, without sufficient security, the sums of money upon contract materials not in the possession of the Crown.

That, I contend, was an improper thing to do—a thing which was never contemplated by any Minister. No Minister, I am satisfied, would give such authority ; and it is quite evident that authority was not obtained in this instance. I am satisfied that no Minister, had he known the nature of the transaction, would have given his authority for it. This brings me to Contract 79A. My first charge was—

With inducing the Minister, on the plea of urgency, to let the above Contract 79A to Carter, Gummow, & Co. without tender, and upon departmental estimate, by which a loss is liable to be sustained by the Crown.

That is a weakly supported charge, I admit. There does not appear to be evidence enough to show that Mr. Hickson, in any wrong way, gave the concession to Carter and Co. ; but that they obtained a concession by getting that contract there can be no doubt. Whether the concession was given by the Minister alone, or whether by the Minister assisted by Mr. Hickson, I do not know. It appears to me, however, that Mr. Hickson ought to have pressed more than he did his minute to the effect that this contract should be tendered for. There can be no doubt that had it been put up to tender there would have been a saving upon it. There were smaller contracts in connection with No. 79 and 79A, which were given to Carter, Gummow and Co. ; and if your Honor will look at the prices, seeing that the contracts were not very big contracts, but were simply branches of the sewer—if, I say, your Honor will look at

the prices paid for these works you will see that had they been put up to public tender, they would have been carried out at a greatly decreased cost. My second charge in connection with Contract 79A is—

With advancing the sums of money of the moneys of the Crown to the contractors upon insufficient movable security, and in violation of the contract between the contractors and the Crown.

I contend that the specification should be read literally in the interests of the State, and that the action taken by the department was not a proper action in this case. Charge No. 3 was—

With failing to place upon the Table of the House the papers ordered by Parliament, by which Honorable Members might be misled as to the nature of the transactions.

I repeat that all the papers having any reference to these contracts should have been laid upon the Table of the Legislative Assembly. My fourth charge was—

With permitting defective work to be executed by the contractors, by which a loss is sustained by the Crown.

I submit that that has been clearly proved by the evidence of Dawson, and by the examinations made by Mr. McCredie and Professor Warren. Coming to my charges in reference to Contract 118, there can be no doubt that those charges have not been proved. Evidence has not been forthcoming to prove them, with the exception of the charge relating to the omission of necessary papers from those laid before Parliament. There is one charge with reference to the Glebe contract, and it is as follows:—

With allowing defective work to be done, by which a large loss of money was sustained by the Crown, and with not making any effort to recover such loss from the contractors, Messrs. Carter, Gummow, & Co.

Now, with reference to that contract I really think that, although the evidence before the Commission has been small, from rumours which have been mentioned here—I admit that the evidence is only hearsay—the contract ought to have been examined by some one independent of the department or contractors, in order to see that it has been carried out in a proper manner. Conclusive evidence has been laid before your Honor in support of the charge I made, that defective work had been carried out upon four or five contracts which have been dealt with. There has been a constant saving of cement, and the putting in, in its place, of inexpensive material. In regard to this very Glebe contract we have had clear definite evidence of a similar scamping in cement work, and if it be worth while to scamp the work in a small degree your Honor may be sure that the same men will scamp it in a greater degree, whenever the opportunity presents itself. As to the question whether Messrs. Carter, Gummow, & Co. knew anything about it, I should be very sorry if evidence showed that they did. The only object I had in this inquiry was to show that these irregularities did go on, and having done that, then, so long as a stop is put to these practices, I am satisfied. I do not wish to see persons get into trouble. There can be no doubt the men working for Carter, Gummow, & Co. have constantly done bad work, but whether they have done bad work, authorised or unauthorised, I do not know if the evidence is conclusive enough to show. With reference to the charge as to Mr. Hickson's giving concessions to the contractors, I consider that the charge has been fully proved, because the advantages which they have derived from these contracts are undeniable. From whatever reason—whether from motives of friendship, or from other motives, there was not evidence to show—but many concessions have been made. It is beyond all doubt now that great concessions have been made to Messrs. Carter, Gummow, & Co. by Mr. Hickson. In conclusion, I desire to say just a few words in regard to the manner in which I have conducted this inquiry. As I said in the first place, I did not want to come before this Commission otherwise than as a witness, because it seemed to me that, if I departed from that course, I at once laid myself open to the charge of being a persecutor. I came before the Commission because, having made the charges as I did, I wished to take the onus of them, and to do all that I could to show that they were as true as I myself believed them to be, and to assist your Honor in eliciting the truth, even although it might be against me. That I have done. I have done everything in my power to bring before this Commission—in an honorable fashion—evidence to sustain my charges. I have been very careful, your Honor, not to bring here men whom I thought to be of doubtful character. I might have obtained innumerable witnesses had I been less particular in that regard. Your Honor would probably be surprised did you know the number of witnesses who have proffered their testimony, but whom I have rejected. If your Honor were acquainted with the full particulars, you would see how very careful I have been not to put the Commission on the footing of an improper prosecution. When the Commission was first granted, therefore, I went immediately to men of known repute—men of good repute as to truthfulness—and concerning whose character I myself had such a knowledge as to convince me that they would be honorable and trustworthy witnesses. Among the witnesses I have brought before your Honor have been Mr. McCredie, of whom your Honor must have formed a very high opinion, Mr. Thompson, a very accurate

accurate and careful quantity surveyor, Mr. Young, Mr. Dean, and Mr. Christie. I have brought other reliable witnesses, who, I thought, would not be influenced by me in any way to give evidence which was not of an absolutely truthful nature. These witnesses have been most careful and accurate in all that they have done, and had I made the slightest effort to mislead them, or to draw them to my side with a view to my winning the case, as it may be called—if I had endeavoured in any way to make tools of them, they would have resisted such advances and endeavours. That I knew from the first. I obtained the services of these men, because I thought it the proper and honorable course to endeavour to get at the absolute truth in these matters. Mr. Smith has, in his address, stated that the evidence which I myself gave, coupled with notices of motion which I have given in Parliament, indicated that I had a commission, as it were, from certain old constituents of mine, or, if I were to take his words at their literal meaning, I was under a pledge to carry out certain obligations to my constituents at the time of my representation of the electoral district of East Sydney. I think that insinuation may be thrown to the winds at once. Again, Mr. Smith contended in his address that I had an object in bringing these matters before a Commission—that I was actuated by a feeling of animus against Mr. Hickson in consequence of my relations with the Public Works Committee. Now I think your Honor will free me of any such accusation. You will not, I am sure, be of opinion that I entertained any feeling of this sort, because, after all, these charges are not directed specifically against Mr. Hickson, but they are directed against the administration of the department. For that reason I have used the word "Government" generally in charges which I could not associate with any individual, but which contained matter, the responsibility of which, I thought, should be sheeted home to some person or persons; feeling, as I did, that these persons could be found only by a most searching inquiry by a Commission such as your Honor has held. As to my having any ill-feeling against Mr. Hickson or against any officer of the department, I can freely urge that Mr. Smith's contention, even upon the evidence he has suggested, cannot be entertained. As a matter of fact, it is very poor satisfaction, your Honor, to a public man to prosecute any inquiry concerning a matter where he thinks there is need for reform, simply upon the basis of prejudice or a feeling of vindictiveness against any individual who may be concerned. It is not worth the while of any public man to take action from such motives; but there is a much higher object which a public man may have, and that is to agitate for reform where he knows that there is an absolute necessity for it. It is only when a public man is actuated by such a motive that he can derive any satisfaction whatever from the discharge of such a duty as I have taken up in this case. I shall not be at the pains of defending myself against the insinuation that I have been actuated by the motive of obtaining any benefit for myself or for other persons, or that I have acted from spleen against any individual. My motives were simply these. I know—and the evidence which has come before your Honor has clearly proved it to be so—that there is a waste going on in the public funds of this country, and particularly in the Public Works Department, and the object I have in view is that this waste shall be remedied by some proper method of control, either by the Treasury or by some other department—control exercised in such a way as to make it impossible for such things to take place as have been demonstrated by the evidence submitted to your Honor to have occurred in this department. That is the sole object I have in view. Having certain information, I thought that the best way to discover the truth or untruth of it was to have a Commission of Inquiry. I asked for a Select Committee or Commission. If your Honor, in your profound wisdom, should consider that the effect of this inquiry has not been to support the truth of the charges which I made, then, of course, there will be no need for any change in the Public Works Department; but if, as I contend, a certain number of the charges which I have made are well-founded, then certain action must be taken, and I shall have attained the object I had in view—that object being that there should be some control over this great spending department of the State with a view to save an annual waste in the public funds of this country. I apologise for having occupied so much time by my address, but I could not possibly have reviewed the quantity of evidence which has been tendered without going very fully into it. I now, with every confidence, leave the true judgment of the matter to your Honor's profound intelligence and sense of justice.

*His Honor:* The time occupied by your address, Mr. Parkes, has been rather long, but I can clearly see that from the enormous amount of material you have had to review you could not have discharged your task within a shorter period. As to the manner of the address, I certainly have no complaint to make with regard to that.

His Honor, at 1.15 p.m., adjourned the inquiry until 10 a.m. on Tuesday, 13th October.

C. E. R. MURRAY,  
Commissioner.

TUESDAY,

## TUESDAY, 13 OCTOBER, 1896.

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 10 a.m.  
Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. R. R. P. Hickson, Under Secretary for Public Works (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising); attended.

Mr. J. Davis, engineer for sewerage, and Mr. Norrie, bond clerk, also attended.

Edward Mann Clark and John William Townsend Boys were sworn and examined.

Joseph Davis was recalled and further examined.

His Honor, at 12:40 p.m., adjourned the inquiry until 10 a.m. on Friday, 16th October.

C. E. R. MURRAY,  
Commissioner.

## FRIDAY, 16 OCTOBER, 1896.

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. Ernest Smith, solicitor (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising); attended.

Mr. J. Davis, engineer for sewerage, and Mr. Norrie, bond clerk, also attended.

George Christie, Frank Moorhouse Gummow, John Carter, and Joseph Davis, were recalled and further examined.

His Honor, at 12:35 p.m., adjourned the inquiry until 10 a.m. on Monday, 19th October.

C. E. R. MURRAY,  
Commissioner.

## MONDAY, 19 OCTOBER, 1896.

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. Ernest Smith, solicitor (appearing for Mr. Hickson); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising); attended.

Mr. J. Davis, engineer for sewerage, and Mr. Norrie, bond clerk, also attended.

David Graham Snodgrass was sworn and examined.

Joseph Davis was recalled and further examined.

Mr. Davis said that the department was being put to very serious inconvenience through the retention by the Commission of various papers and plans, and he would be glad if His Honor would make an order for their release at the earliest possible moment.

His Honor said that the whole of the papers which were not required to be printed as Appendices could be released at once, but in releasing them he would ask that the department would not have them conveyed away from the building, and that they might be placed in a room where they would be available for inspection by the Commission if necessary.

Mr. Gummow desired to know whether His Honor would at the same time release the bank pass-books of the firms of Carter & Co., Carter, Gummow, & Co., and Gummow and Gillan; also the bank pass-books of the private accounts of the different members of those firms.

His Honor said he did not think there was any necessity to retain the books any longer. The results of their examination, he assumed, were crystallised in Mr. Christie's memoranda. He would direct the immediate return of the books to Mr. Carter.

*His Honor*: There being no further evidence to be tendered, there will be no necessity for me to adjourn the hearing to a further date. At the same time, if anyone should wish to make application for the hearing of evidence I will entertain that application at any time. This room will be considered the office of the Commission until my report is finally sent in to His Excellency—in fact, until the 21st of November. I, therefore, adjourn the inquiry *sine die*.

C. E. R. MURRAY,  
Commissioner.

## TUESDAY, 3 NOVEMBER, 1896.

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 10 a.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow (Mr. Andrews, solicitor, advising); attended.

Mr. J. Davis, engineer for sewerage, and Mr. Norrie, bond clerk, also attended.

Robert Rowan Purdon Hickson, Joseph Davis, George Scott Chiene, and Andrew Eaton, were recalled and further examined.

His Honor, at 12:15 p.m., adjourned the inquiry until 2 p.m. on Wednesday, 4th November, 1896.

C. E. R. MURRAY,  
Commissioner.

## WEDNESDAY, 4 NOVEMBER, 1896.

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 2 p.m.

Mr. Varney Parkes, M.P. (Mr. White, solicitor, advising); Mr. R. R. P. Hickson (Mr. Ernest Smith, solicitor, advising); Mr. Carter and Mr. Gummow (Mr. Andrews, solicitor, advising); attended.

Mr. J. Davis, engineer for sewerage, and Mr. Norrie, bond clerk, also attended.

Joseph Barling, Robert Rowan Purdon Hickson, Christian Herman Ohlfsen-Bagge, and John Carter, were recalled and further examined.

His

His Honor said that several witnesses who had been examined had not made any claim to expenses. He thought that some of those witnesses were not really at any loss through giving evidence before the Commission, and it was very much to their credit, under those circumstances, that they had abstained from making any claim. He hoped they would continue to abstain from asking for any compensation, because, after all, what was given to a witness as compensation was not in any sense by way of reward for the evidence he had given, but was to save him from being at a loss from the time occupied in his attendance. If the witnesses who had given evidence and had not made any claim were abstaining from making it as the result of their not knowing that they were entitled to make a claim, they might come in and make a claim at some future time. If they intended to do so, he hoped they would make the claim as soon as possible, because, if it were not soon made, it was very likely that there would be no possibility of answering it when it was made. At the same time he would repeat that it was to be assumed that witnesses would not make any claim when they knew that they had not suffered loss of time representing loss of money, and that they had not been put to any expense in coming to the Board Room to give evidence. He did not wish to curtail the right of witnesses to compensation if they asked for that compensation, supposing they had a fair right to it. He did not wish to suggest to witnesses who did not see why they should be compensated on the ground that they had suffered no loss, that they should make what would, under those circumstances, be a fictitious claim; he merely asked those witnesses who had a good claim to make it as soon as they could conveniently do so.

His Honor, at 3:45 p.m., adjourned the inquiry *sine die*.

C. E. R. MURRAY,  
Commissioner.

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TUESDAY, 10 NOVEMBER, 1896.

His Honor the Commissioner sat at the Board Room, Chief Secretary's Office, at 2 p.m.  
Mr. Varney Parkes, M.P. (Mr. H. White, solicitor, advising); Mr. Carter and Mr. Gummow, of the firm of Carter, Gummow, & Co. (Mr. Andrews, solicitor, advising); attended.  
Mr. J. Davis, engineer for sewerage, and Mr. Norrie, bond clerk, also attended.  
Joseph Davis and John Carter were recalled and further examined.  
His Honor, at 2:50 p.m., adjourned the inquiry *sine die*.

C. E. R. MURRAY,  
Commissioner.



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PUBLIC WORKS INQUIRY COMMISSION.

MINUTES OF EVIDENCE.

TAKEN before His Honor Judge Murray in the course of his inquiry touching all questions raised in the Legislative Assembly, whether specifically or in course of debate, as to any improper conduct in connection with the Contracts, past and present, of Messrs. Carter, Gummow, & Company with the Department of Public Works.

WEDNESDAY, 27 MAY, 1896.

George Dawson, sworn and examined:—

G. Dawson.  
27 May, 1896.

1. *Mr. Parkes.*] What is your occupation? I am a general labourer.
2. You were for some time working on the contracts of Carter, Gummow, & Co.? Yes.
3. For what length of time? I have been with the firm for about eight years.
4. In almost constant employment? I have been a few weeks here and there without work, that is all.
5. What was the nature of your work? My principal work in the sewers was that of a bricklayer's labourer.
6. In that capacity you would have to pack the top of the sewer? Yes.
7. Will you describe the manner in which the packing was done? If there were any space left between the brickwork of the tunnel and the rock it would have to be packed with concrete and rammed with a rammer to the satisfaction of the Inspector.
8. When you first paid a visit to me you were still in the employment of Carter, Gummow, & Co.? Yes.
9. Lately you have left them? Yes.
10. But you were not discharged? No; I was not discharged, but I was refused work on the next job.
11. You left at the time you did simply because the work ceased? Yes; where I was then working.
12. You did not leave on account of any dissatisfaction with you on the part of the contractors? There was not any dissatisfaction at all.
13. What were your reasons for coming to me? I saw that you had taken the matter up, and I thought it would be a good thing for working men to have it all ventilated. I felt uneasy in my mind. There were several things which I knew which were not right, and I knew that it was of no use my going personally to make a complaint because no notice would be taken of me. When I saw that the matter had been taken up in the House I thought it my duty to come and say what I knew.
14. When you came to me I was reluctant to take any statement from you? You did not wish to hear me at all.
15. When did you first come to me? I could not say now.
16. How many months ago would it be? About ten or eleven weeks ago. I was working on the Annandale job at the time.
17. Will you tell His Honor what description of work was done upon Contract 79 A, by yourself and others? There was some very defective work on that contract. There were great cavities left, and in one case we ran four drums without packing.
18. What would be the size of a drum? It would be from 2 ft. 9 in. to 3 ft. long. It is what the brickwork is built on. You are supposed to pack every one as you build, but we left these cavities, and we thought nothing of it. There are spaces between the brickwork and the rocks with nothing in them. These spaces vary from 2 ft. 6 in. to 2 ft. 9 in. in height. In some cases they are a little higher.
19. What would be the length in lineal feet in any case? It might be about 12 feet. I should say I was within the bounds in saying that.
20. What is the total length of the cavities, do you suppose, which have not been filled up? I was speaking then of one particular case, but none of the work has been thoroughly packed with the exception of an odd drum or two.
21. *His Honor.*] When you say that none of the work has been thoroughly packed what length of sewer are you speaking of? I was speaking of particular parts where I was working.
22. How many drums would it be in length? The big cavity to which I have referred is about five drums in length.
- 22½. *Mr. Parkes.*] Is it near shaft No. 13? It is between No. 12 and No. 13.
23. For what distance at that point does the defective work extend? I could not state the exact distance. I do not know the length of the drive.
24. Would it be between 200 and 300 feet? More than that.
25. Would it be 400 feet? Yes.

- G. Dawson. 26. Would it be 500 feet? Taking one drive with another, I should say 500 feet. There would be that quantity of defective work.
- 27 May, 1896. 27. In your opinion that defective work imperils the safety of the sewer? Undoubtedly.
28. What is the thickness of the brick-lining? Four and a half inches.
29. How far from No. 13 shaft, going down stream, is the point at which this defective work commences to your knowledge? 275 feet I should say from the centre of No. 13 shaft going down stream. There may be a drum or two with a certain amount of packing in them. There would be about 310 or 320 feet from the shaft to where the cavity of which I have spoken exists.
30. *His Honor.*] How far would you have to go from that point before you got out of the defective work? From 12 to 14 feet.
31. That is the greatest extent of defective work down that drive upon which you have worked? Yes.
32. You have worked lower down in the drive? Yes.
33. But you know that below the point you have named it is properly packed? Yes.
34. *Mr. Parkes.*] Did you work upon Contract 79? Yes.
35. Do you know whether the work in that contract was all correct? I know that there has been some scamping, but I could not locate any bad work.
36. But you know it is there? Yes; I did it myself.
37. But you say you could not locate the work now? No.
38. It could be located by taking out a few bricks here and there? By an expert, I daresay it could.
39. You have had conversations with various men working on this job? Yes.
40. Was the defective work in this contract similar to that in Contract 79A? It was not similar. It was scamping in the cement. The cavities were filled in in the case of Contract 79. It was only the cement which was scamped.
41. *His Honor.*] Do you mean the cement in the brickwork or in the concrete? I mean the cement supposed to be used in the concrete.
42. *Mr. Parkes.*] Will you describe to His Honor how you workmen deceived the inspectors in order to get this scamped cement in? We had to get them out of the way. Some reason was given to get them away. There are several ways of reducing the quantity of cement. You can knock the gauge into the sand, and put the cement in.
43. *His Honor.*] What is the size of the gauge? They are of different sizes.
44. *Mr. Parkes.*] You did not put in this defective work of your own inclination? No.
45. Why did you do it? To keep our places.
46. Who gave you instructions to do it? The manager of the job told us that the inspector was taken away, then it was our own lookout what we did.
47. As a matter of fact, your employment depended upon your doing that kind of thing? Yes. If we did not do it we should not be kept there.
48. You know Inspector Reid? Yes.
49. I believe he is a very severe man? He is very strict.
50. He was particularly severe upon you men? He did his duty. He would not allow us to do anything wrong.
51. Were you afraid to do anything wrong when you were under him? It would not do to let him catch us in any shape or form.
52. Inspector Reid was removed from Contract 79? Yes.
53. When he was removed you had a freer hand? Yes. There was no one to watch us as closely as Inspector Reid had done.
54. You know the reason of his removal? Yes. I believe it was because he caught myself and the foreman bricklayer in the act of doing what we ought not to have been doing.
55. You were in the act of doing bad work when he caught you? Yes.
56. What was the bad work? We were shovelling dry metal down without any cement or sand mixed with it.
57. *His Honor.*] Shovelling it where? We were packing the side of the shaft. Inspector Reid came upon us, and saw us shovelling down this dry metal. We said, "We are going to put in the compo. that was left."
58. *Mr. Parkes.*] And Inspector Reid insisted upon your doing correct and proper work? Yes.
59. Of course an Inspector of Works cannot be very delicate in the use of his words. He sometimes has to use some very strong language;—he must be naturally a rough man? Certainly, because he has rough men to deal with.
60. If Inspector Reid did at times use abusive language it was on account of the class of men with whom he had to deal? I cannot say that he ever used abusive language in my hearing.
61. When he tried to stop you from proceeding with the defective work did he use very strong language? Not in my hearing.
62. After he had discovered you doing that work, do you know what became of him? He was removed from the job. I cannot say where he went.
63. Do you know why he was removed from the job? I cannot say why, unless it was for the particular thing I have just named. I do not suppose he would be told why.
64. At what space of time after the incident to which you have referred was he removed? Two or three days, to the best of my knowledge.
65. Another inspector took his place? There were so many that I could not say whether any particular person took his place.
66. Then you do not know who succeeded him? I believe Mr. Eyre came after him, but I would not swear to it.
67. Was he as hard upon you as Inspector Reid was? He was never so much near us as Mr. Reid was.
68. I believe you also worked on Contract 69? Yes.
69. Part of that sewer was packed with cement? Yes.
70. I believe there was a length of it which you packed with something else—with shale? We packed some with shale. There was metal on the board, but I could not say whether it had to be packed with cement or not. I am referring now to the part in Emily-street, adjoining O'Neil and Rogers' contract.

71. *His Honor.*] You mean the end of Carter, Gummow, & Co.'s contract in that direction? Yes.
72. *Mr. Parkes.*] You say there was metal and concrete on the board? Yes. We packed the first drum with concrete, and afterwards we used shale.
73. To what length? I should say from 600 to 700 feet. I cannot swear that that is the exact distance.
74. You were instructed to do that by your superior? Yes.
75. Was there an inspector overlooking it? Yes.
76. Who was the inspector? Mr. Tudgay, I think, was in charge.
77. You were instructed, I suppose, by the contractor in charge? By our foreman.
78. Is it not a very precarious thing for a man like you to give such evidence as this? Yes; it will spoil me from getting any work in the future.
79. *Mr. Hickson.*] Do I understand that you acknowledge before this Commission that you deliberately did defective work? Yes.
80. I hope I make myself quite clear;—you did certain work knowing it to be defective? Yes.
81. When did you make up your mind to confess to having done this defective work? As soon as I saw from the newspapers that it had been brought up in the House.
82. Did you ever tell any of the officers of the Department, the resident engineer, or the inspector, what was being done there? Never.
83. I understand you to say that you got instructions from time to time to do this defective work? Yes.
84. Take the two North Shore contracts, who gave you instructions in that case? The manager used to tell us that the inspector was taken out of the road, and it was then our chance to do it.
85. In the case of the Marrickville contract also you say you were instructed to do this defective work? Yes; we got instructions from Foreman Connors.
86. He was the man who gave you instructions to do this defective work? It was only packing with shale in that case, and I do not know whether that would be supposed to be defective or not. Connors gave us instructions to pack the shale.
87. You say that Inspector Reid was sent away from the North Shore contract on account of his being too accurate in looking after the work? I did not say that. I said I did not know why he was removed. He caught us in the act, as I told you, and several days after that he was removed.
88. By whom was he succeeded? I cannot be positive whether Mr. Eyre was his successor or not.
89. Inspector Reid was strict, and Inspector Eyre you say was not? He was never standing over us as Inspector Reid was. I do not say that he was lenient, but he was never standing over us in the same way as Inspector Reid was.
90. Where was he if he was not overlooking the work? It was not my place to know where he was.
91. Do you mean us to understand that he was off the work altogether? He might have been.
92. You mentioned the contractor's manager, Mr. Reid, and Connors on the North Shore contract? Yes. Connors was the foreman of bricklayers.
93. Did he give you instructions about this bad work? No; he sometimes worked with us in doing it. It was the manager who gave us the instructions in that case.
94. *Mr. Carter.*] Did you ever inform me, or any member of the firm of Carter, Gummow, & Co., that this defective work was going on? No.
95. Did I, or any individual member of the firm, ever give you any instructions as to this defective work? No.
96. Were you ever restricted in material—was there not always plenty of it? There was always plenty.
97. No question was ever asked as to where it was going, and you were not grumbled at for using too much? No.
98. There was always plenty of material had you chosen to use it? Yes, there was always plenty of material.
99. There was sometimes too much, and it had to be carted away? Yes. It had to be carted away on Contract 79 A.
100. Does not that apply to almost every job? There has always been plenty of material on any job I have been on.
101. You were not dismissed, but you were paid off in the ordinary way with a number more men? Yes.
102. You were afterwards re-employed on another contract at Johnston's Creek? Yes.
103. You saw Mr. Gummow there? Yes.
104. Would you mind telling His Honor what you told Mr. Gummow as to these charges? I asked Mr. Gummow if he would give me a start on the work over at Annandale. I said I had come to him personally because it had been said that I was going to put the company away, and that they would not give me work. I said I would not ask any other member of the firm but himself, as he knew me personally better than any of the rest of them. He said there had never been anything said about me that he knew of, and that if there was he would tell me straight. I asked him whether he would give me a reference, as I could not afford to be walking about idle. He said, "You will not want a reference; we shall have a job for you before the end of the week. If you come to me at the latter end of this week I will let you know definitely what I intend to do." I went back on the Friday. As I was passing another section of the work I saw Mr. Gummow in conversation with the foreman. I walked down to the Johnston Creek job and waited for Mr. Gummow. When he came he said, "You had better see Bandeen." He said he had spoken to him for me, and that there was work for me. When I went over to see Bandeen he told me I could come up on the following Monday.
105. *His Honor.*] It was after that that you got on to the Annandale job? Yes.
106. You interviewed Mr. Parkes after that? Yes.
107. *Mr. Carter.*] You have seen Mr. Gummow since? Yes.
108. You have endeavoured to get work from us within the last fortnight? Yes; I asked a foreman of yours.
109. In spite of all that you say had happened? Yes.
110. Referring to this matter of packing, what would you be doing when you were supposed to be packing, and were in reality not doing it—were you sitting down? I was getting in bricks, to do more work.
111. You never had so much to do that you could not have packed had you chosen? We might have packed, but we could not do the quantity. The bricklayers were always complaining that we were not doing enough.

G. Dawson.  
27 May, 1896.

- G. Dawson. 112. *Mr. Hickson.*] You said, in reply to Mr. Carter, that there was always plenty of material on the ground? Yes.
- 27 May, 1896. 113. What became of it if you did not put it into the work? It was left lying about. I believe there is some lying about there yet.
114. *Mr. Parkes.*] Was it your place to inquire what was done with the material? Not at all.
115. Did you ever see any member of the firm on your work? They passed along, but they never came down.
116. Was there any chance of your approaching them? I could have done so at the pay office had I wished to communicate with them.
117. As a matter of fact, you could not approach them for instructions? No; the instructions were given to us by the manager, Mr. Reid.
118. He was the representative of the firm, and you thought that in taking instructions from him you were taking them from the firm? Yes.
119. *Mr. Hickson.*] There was no reason why you should not make your complaint at any time to the Government Inspector, who was always on the ground? I could have done so, but if I had I should have had to leave.
120. *His Honor.*] Do I understand that you had had some communication with someone before you had the conversation with Mr. Gummow to which you have referred? Yes; we often talked among ourselves. The men would talk about the scamping which was being done. I often said that it was only right that it should be reported.
121. You expressed that opinion? I did, freely.
122. Alluding to the scamping? Yes; I said anyone was at liberty to carry what I said to the firm, and in my opinion it was carried to the firm or to their representative.
123. That was quite apart from anything which had been said publicly? Nothing had been said publicly then. It was simply among the men on the work by themselves, and it was carried to the manager, Mr. Reid.
124. The packing, I understand, in the case of the North Shore job was in a rock tunnel where blasting had been carried out? Yes.
125. Was that tunnel blasted out in many places beyond the required dimensions? Here and there there are places blasted out considerably above the usual size. It is so in all sewerage works. You cannot do it to a nicety.
126. So that the packing would be irregular, running from an inch or two to say 2 ft. 9 in.? Yes; there were places where you could not get in a half inch. It was supposed to be trowel-packed there with cement.
127. The other job in which you say shale was packed in was of a similar nature as regards the blasting? Yes.
128. The excavation had not been made by hand. It had been blasted? Yes.
129. And the shale was put in under similar conditions? Yes.
130. There were various depths and thicknesses? Yes.
131. You do not know whether the shale was put in by authority or not? No.
132. Was the cutting through shale? Yes.
133. And some of the shale which had been taken out was put in again, I suppose? Yes.
134. Was it hard blue shale or clay? Ordinary shale.
135. Supposing it had been a perfectly legitimate thing to use the shale for packing, would you say that the work was done in a proper way? Yes; no one could find fault with it.
136. The shale was packed in between the shale wall and the crown of the sewer? Yes.
137. *Mr. Parkes.*] The packing is put in to keep the sewer from weeping? Yes; and when the sewer is charged with gas it would lift I should think if it were not packed.
138. *His Honor.*] Supposing the cutting is hand-work and not blasting, and supposing it to be absolutely true, is there then any packing at all, or have the bricks to be put tight against the wall of the drive? There are certain places where the bricks would fit very closely. Sometimes you would have to scabel to make them fit; in other cases there would be half an inch and upwards to spare.
139. The barrel itself is supposed to be watertight? Yes.
140. The bricks being bedded in cement? Yes.
141. *Mr. Parkes.*] The barrel will not in itself keep the water out? If it is properly bedded in cement.
142. If it is a good job? Yes; if the joints are all filled.
143. Did the tunnel in Contract 69 weep? I have not been through it since to see. It was a plasterer who complained to me of the weeping. I did not see any weeping in the brickwork. The barrel was half brickwork and half concrete.
144. The packing applies to the crown? Yes.
145. The weeping would occur from drainage outside the sewer? Yes. Had there been subducts it would all have been carried away.
146. The subducts are intended to carry that water off? Yes.
147. And they would have carried it off in this particular instance? Yes.
148. It would be a defect in a sewer to have the weeping continue? Yes; but the plasterers' work is to stop it.
149. *Mr. Hickson.*] Did you ever see subducts in a rock cutting? No.
150. *Mr. Parkes.*] Is there no weeping in a rock cutting? Yes; and if the subducts were there they would carry all the water away.

George Benson sworn and examined:—

- G. Benson. 151. *Mr. Parkes.*] What is your occupation? I am a water and gas-pipe layer.
- 27 May, 1896. 152. You were employed by Carter, Gummow, & Co.? Yes.
153. Were you long in their employ? Seven or eight weeks.
154. *His Honor.*] Can you fix the date? I think it would be about last July.
155. *Mr. Parkes.*] You were employed upon Contract 69—the Marrickville contract? Yes.
156. You were employed to connect what is called a flushing-pipe with the sewer at a point on the Illawarra Road between Marrickville Road and Sydenham Road? Yes.
- 157.

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157. Will you describe to His Honor the nature of the work there? I was connecting a 20-inch water main. I had to join the two ends, and to caulk them with lead. It was a water-supply pipe intended to flush out the sewer. The distance apart of the two ends upon which I had to fix the collar was too great. A sufficient length of pipe had not been allowed to permit of the two pipes coming properly into the collar. The collar barely covered them three-quarters of an inch on each side, whereas there should be 6 inches on each side if the caulking is to be properly done. You have to caulk with spun-yarn first, and then run in your lead. There was also a flange-joint at the same place underneath a concrete culvert, in which the bolts were not long enough.
158. How far beyond the collar would that be? About 8 or 9 feet. Some of the bolts had only two threads for the nut, some three threads, some only half a thread, and in some cases the bolts would not go through at all. The bolts are supposed to go right through the joint, and the nut is screwed on the outside. You could hardly get a grip at all with some of the nuts.
159. How many bolts would there be? There would be fifteen or sixteen bolts round a 20-inch flange.
160. This pipe would have to stand a great pressure of water? I believe it would.
161. Therefore it would need to be well caulked and bolted, and well shouldered up? Yes.
162. And that work was not done? Not properly.
163. The work that was done is grossly defective? Yes.
164. *His Honor.*] What you mean to say is that you did the work as well as you could, but that as a matter of fact there was not sufficient length of pipe? There was not.
165. Was the work in the case of the flange joint your own work, or was it merely defective work which you noticed? It was my own work, and I was paid for doing it. I got 1s. 3d. a joint. It was piece-work.
166. *Mr. Parkes.*] You knew you were doing wrong? I knew the job was not being done properly.
167. Did you say so to those who employed you? They knew I was doing wrong.
168. Did you protest? They told me to make the best job I could of it, and I did so.
169. Why did you do the work under such conditions? Because I was paid for it. I knew that if I did not do it someone else would, and that is why I did it.
170. Do you know of any other defective work on that job? No; I was not long enough there. I was only there seven or eight weeks.
171. You were in the pay of Carter, Gummow, & Co.? Yes; Mr. Forrest was then managing.
172. Did he see the work to which you have referred? I believe so. He was there at the time.
173. Did he make any comment? I do not know if he looked at it. I spoke about the bolts being too short for the flange joint. I measured the flanges, and found the bolts the same length as the flanges. They were not sufficiently long for the nuts to screw on outside. Mr. Forrest was there on the ground while all this work was being done.
174. Mr. Forrest is a member of the firm of Carter, Gummow, & Co.? Yes.
175. *Mr. Hickson.*] You say you received so much a joint for this work? Yes; 1s. 3d. for the small ones, and 3s. for the big ones.
176. You did them badly—that is what it amounts to? I did the best I could. Banteen told me to make the best I could of the job.
177. You said just now, in answer to Mr. Parkes, that this water-pipe would have to carry a heavy pressure? I understood from the inspector that it did.
178. Was it a Water and Sewerage Board pipe, or was it a pipe in connection with this contract? It was a water-main to keep the sewer flushed.
179. Did it connect further on? Yes. I did not connect it with the sewer.
180. You do not appear to be quite certain whether it was a Water and Sewerage Board main or not? It was not a water-main to supply the public with water for drinking. It was simply a main to flush the sewer.
181. It was a main belonging to the Water and Sewerage Board, was it not? Well, it was connected with the sewerage work.
182. Of course if it were a water-main Carter, Gummow, & Co. could not touch it? I do not know about that. They said the water was intended to flush the sewer.
183. It could not carry a heavy pressure unless it were a main of the Water and Sewerage Board, and if it were a main of the Water and Sewerage Board, then Carter, Gummow, & Co. had no right to touch it? All that I know is that I got the job to do at so much a joint. I was told to manage the defective joints as best I could, and I did so knowing that if I did not do it someone else would.
184. Supposing the pipe had to do nothing but carry an overflow, and that there was no pressure, would it not have been sufficiently strong? It was not at all sufficient. It would leak if there were no pressure at all. If the pipe were full of dead water it would leak.
185. Did you report this to anyone as a defective joint? They knew all about it. I told them it was bad work.
186. Whom did you tell? Banteen was one and Husband was another.
187. You told them about the defective work? Certainly; I told both of them it was a bad job.
188. *Mr. Carter.*] Did you tell Mr. Forrest? No; I did not speak to Mr. Forrest about it.
189. *Mr. Parkes.*] There is no doubt about your being employed by Carter, Gummow, & Co.? I was under them.
190. You were doing their work? Yes, so I understood.
191. This defective work, for all you knew, was part of Carter, Gummow, & Co.'s contract? Yes; I had so many joints to do and I did them, and I had other men working with me.
192. *Mr. Hickson.*] What were their names? James Brennan was one and the name of the other one is Boyd.
193. What would be the difference in the cost between making the job you are speaking of a good one and a bad one—that is, the bad one that was made of it;—would it be a big item? It would not cost very much if the job were well done. It would only amount to a few pounds of lead more in each joint—I dare say 30 lb. or 40 lb. of lead more in each joint.
194. You thought it worth while to make a bad job in order to save that? I could not do the job in any other way; the pipes were cut short before they came down.
195. Who cut the pipes? I cut them under directions.
196. What made you cut them short? They were measured and marked.

- G. Benson. 197. Who did that work? Husband.  
 198. He marked the pipes and marked them short? Yes, he and Bandeen; I asked them if they were right and they said yes, and I then cut them.  
 199. *His Honor.*] I understand that you cut the particular pipes to which you have referred? Yes.  
 200. But the mistake was made by those who did the measuring and marking? Yes.  
 201. When you came to put the pipes into the collar you found that they were too short? Yes.  
 202. And you were then told to go on and finish the job with the pipes as they were? Yes.  
 203. *Mr. Parkes.*] You are quite sure that you drew attention to the pipes being cut short? Yes; I am quite sure they knew about it.  
 204. *Mr. Hickson.*] I understand that Husband was the man who made the pipes short? Yes; he was the man who measured them with the tape.  
 205. Did you at any other time point out to him that the pipes would be too short? I told them I did not know how the job was going to be done.  
 206. And still they persisted in having it done? Yes.  
 207. You said this to Husband? Yes, and to the foreman. They told me to make the best I could of the job.  
 208. Notwithstanding that you told Husband that the pipes were too short, he told you to do the job? Yes.

Robert George Reid sworn and examined:—

- R. G. Reid. 209. *Mr. Parkes.*] What is your occupation? I am unemployed at the present time, but I was an inspector in the Sewerage Department.  
 27 May, 1896. 210. When did you leave the Government service? About three months ago. I do not know that I can be said to have left it. I am only waiting until some more work comes out.  
 211. Were you dismissed? No.  
 212. Why did you leave? Simply because there was no more work for me at that time.  
 213. You were told that? Yes.  
 214. Were there other inspectors kept on? Yes.  
 215. Was there any diminution in the contract work? Yes; that must be so. There are always a number of contracts let, and a certain number of them are always being finished.  
 216. There are as many sewerage contracts going on now as there were when you were employed? I cannot say.  
 217. When you left the service you were under Mr. Hickson's department? About three months ago I was actually under Mr. Darley, I think, but before that I had always been employed under Mr. Hickson.  
 218. What contract were you inspecting when you left the service? The contract I was inspecting was at Parramatta, and the inspector there applied for a holiday and I relieved him for a fortnight.  
 219. Before that you were on Contract 79 at North Shore? Yes.  
 220. How long were you on that contract? About four months.  
 221. Had you any need to complain of the work there? Yes, I had.  
 221½. Did you often complain? I think I sent to the inspector in charge two or three reports.  
 222. They were written reports? Yes.  
 223. Were they all reports upon defective work? Some of the reports were made only verbally to the inspector in charge; others were written. I have no note concerning those which were given verbally, but as to those which were written I have a note in my pocket-book.  
 224. Can you tell us from your notes the contents of these reports? According to the first report, which was made on the 31st January, 1894, I saw Connors, the foreman bricklayer, and Dawson, a labourer, putting down dry stone at No. 6 shaft. They put down about two and a half barrow loads. There was a batch of concrete on the board, and there were about two or three loads of broken stone close alongside. Of course, when they saw me they stopped and mixed a little bit of dry compo. with it. I told them that that would not do, and that I should have to report them. I reported them to Inspector Fowle, and he made his report on mine and sent it on to Mr. Davis.  
 225. What was the result? Mr. Davis came over one morning about 9 o'clock and held an inquiry in the company's office in Alfred-street, North Sydney.  
 226. But what was the result of the inquiry? All that I heard Mr. Davis say when the inquiry was over was "Well, Snodgrass, what do you say to that? You can only contradict it." That is all I heard of it with this exception—that Mr. Davis when he came out from the inquiry called me aside and said "Reid, do you believe they were both equally guilty?" I said they were both equally guilty of putting down the stone, but that I did not think the labourer ought to be charged with what he was told to do by the foreman. That was all that came out of the report as far as I heard of it.  
 227. What is the date of your next report? I do not know the date of it. It would be about a week after the former report.  
 228. What was the effect of it? I went to No. 6 shaft—the same shaft as before—a little after 1 o'clock on a Saturday. I saw Henderson, a bricklayer, and a labourer whose name I do not remember—I think it was Hutchins—who were about finishing the packing in No. 6. They required about half a gauge or say about 10 feet to finish the packing of the shaft. They started to gauge it. The stone was very dirty, and I asked Henderson to fork the stone instead of using the shovel.  
 229. The forking was necessary to fix the gauge? On account of the stone being dirty. It is provided for in the specification. Henderson said it did not require forking. I said it did, and that it was very dirty. While we were talking Connors, the foreman bricklayer, came up and said, "Take no notice of him. He is only a damned buck navy." Of course I made a note of it, and told Inspector Fowle, and he reported it. I may state that before this I reported Reid, the contractors' representative. He came to me at No. 5 shaft and told me to tell the inspector in charge that he did not intend to pack any of the shafts until they were finished. I said I did not think it was possible to build a shaft 200 or 300 feet without packing. He said, "Never mind. You tell him; this will show you fellows that you are not going to have it all your own way." I asked him to put it in writing, and we should then understand each other better. He said he had not a piece of paper, and I produced half a sheet of note. He wrote out a report, but he said he would not send it, but that I was to tell Inspector Fowle, and that as for me he would see that I was shifted off the job within two or three days. 230.



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30. What date is that approximately? It would be about Christmas time, 1893. It was either a little before or a little after Christmas; I do not remember the date exactly. I made another verbal report of Henderson, the same bricklayer, about packing the drive at No. 7 shaft. He was packing with the chippings that came from the drive. The drive had evidently been too small, and when they came to run the brickwork along if they had to scabel to allow the brickwork to be put in. The chipping was lying at the bottom of the invert of the sewer. They started to pack the drive with this, and I told them I could not allow them to pack it in that way, because concrete was specified. He said it was as good as concrete. I told him that if the Department thought it as good as concrete I had no doubt they would have put it in the specification. However, he said he would pack with it. I said, "If you do I shall have to report you." He told the labourer then to run the truck over me. The labourer ran the truck towards me. Whether he intended to run it over me I could not say, but instead of the truck coming over the top of me I got into the truck and was sent along the drive. I ought to have stated that the first night I went on duty there, before I made any report, I went down No. 7 shaft with two bricklayers and two labourers. One bricklayer was packing in very tight ground, and the other was in loose ground. I stayed at the end of the drive where the tight packing was. I was reported to Mr. Boys, the resident Engineer, for being too long at one end. Mr. Boys told Inspector Fowle to tell me to come to him. I called on Mr. Boys, and he asked me to explain why it was, or if it was true, that I was at one end of the drive most of the time. I told him it was true, and I explained the reason, with which he was satisfied. I may state that the night on which I complained of Henderson packing with chippings he and his labourer and another bricklayer went up the shaft before me. I got in the bucket to go up, and gave the usual knock. I do not know whether it was the engine-driver or not who brought me up. I had my candle in my right hand, and I had hold of the rope with the left hand, and the bucket was just off the ground when he took me up the shaft full speed ahead. The force with which I went up blew the candle out before I had hardly started from the bottom, so that I had to go up the shaft a little over or under 200 ft. in the dark. I told the driver he had brought me up very quickly. He said, "I did bring you up quickly." The bricklayer and the labourer who were inside the engine-house laughed.

231. Had you any conversation with any member of the firm of Carter, Gummow, & Co.? With Mr. Snodgrass.

232. And he told you really as a threat that he would have you shifted out of the service? No; none of the contractors told me that.

233. Did you ever receive any intimidation at all from any of the contractors? I saw Mr. Carter in the cable tram at North Shore after one of these reports, and he told me I was making a fool of myself. He said, "As to these reports of yours you know you cannot hurt us. We are too strong."

234. What did he mean by "too strong"? I do not know. I told him I did not wish to hurt anyone.

235. As a matter of fact a man of your position having your duties to discharge must be a very severe, resolute, and courageous man. He must at times be harsh in his conduct and in his way of having his orders carried out? If he wishes to do right for the Department he will have to be so.

236. He cannot very well carry out his duties without at times being harsh in his language? I do not know whether he has to use harsh language. If the men will not do their duty he has his remedy, and can report them.

237. You cannot be very soft or gentle with men who are scamping work? You cannot; but there is a difference between a man being severe and using bad language.

238. You consider that you merely did your duty on this job? Yes.

239. And you consider that scamping was going on throughout it? The only scamping I know of is that which I have mentioned to the Commission.

240. You would have stopped it if you had been left on the job? I was left on the job for about three months, but that did not seem to stop it; it was only getting worse.

241. No attention was paid to your reports;—you received no reply? I never got any reply. After the report about the abusive language of Connors, the foreman bricklayer, I got a letter from the resident engineer, Mr. Weedon, who was relieving Mr. Boys, informing me that I was to at once remove from Contract 79 and to go into Contract 89, and that another inspector would relieve me.

242. What was the name of the inspector who relieved you? Inspector Eyre.

243. You really experienced intimidation while you were on this work, did you not? In some cases.

244. Did you experience intimidation upon any of the other contracts? Never.

245. Where you ordered work to be corrected it was corrected? Yes.

246. How long after your last report was it before you were taken from the job? I reported it on the Saturday, and I got notice on the Tuesday or Wednesday to remove.

247. Do the inspectors get proper support from the chiefs of the Department in doing their duty to the public? I believe they do.

248. Did you in this case? Perhaps they took a different view of the matter from myself.

249. Do you think your removal from this job by your superior heads was right in the public interest? I do not think it was; and I told Mr. Davis so in the interview I had with him.

250. You are naturally unwilling to give evidence against the department? I have no desire to do so. I do not wish to say anything against any of the departmental officers. We have always been the best of friends, although I told Mr. Davis at one time that I thought it rather hard if I had done my duty at North Shore that I should be removed to a job at Lewisham. It was very inconvenient for me, and very expensive too.

251. *His Honor.*] Where were you living at that time? North Shore.

252. *Mr. Parkes.*] You naturally looked to the heads of the Department for support in getting this bad work stopped? Yes.

253. Have you any further evidence to give to His Honor in connection with the hampering you have received in the discharge of your duties? I have seen from the papers that I reported that the concrete was prepared at from 2 to 2:30, whereas it was not required to be used until between 5 and 6. I made that report as to the concrete which was being mixed at Nos. 5 and 6 shafts. I informed Inspector Fowle, and he reported to the resident engineer. That would refer to Contract No. 79.

254. *His Honor.*] What is a proper limit of time for the mixing of concrete before use? The specifications provide that no concrete shall be mixed until immediately before it is required to be used. I believe there is a clause in most specifications to that effect, and I believe it was in the specification of Contract 79, or I would not have called the attention of Inspector Fowle to the matter. 255.

- R. G. Reid. 255. What was the contractors' object do you suppose in having the concrete mixed so long before it was put into position? There were two reasons—first of all it would increase the time of the inspector on the job; the other was that it would give the bricklayers' labourer something to do in the meantime in getting ready to pack the shaft. If it was left until 5 o'clock that would be an hour before the supposed time of the bricklayers coming up. It would then take an extra labourer to do the work that they might have done during the day.
256. It was to save the contractors time and expense? That is the only reason I can give.
257. *His Honor.*] What is the effect of mixing the concrete so long before the time it is required to be used? That is a question I should prefer to leave to an expert.
258. *Mr. Davis.*] Commencing with the concrete you just mentioned, was it wet-up at the time you say—at 2:30 in the day? It was never wet to go down the shaft; it was dry-mixed.
259. So that water was not added until the concrete was required to be put into position? The sand was damp, and so was the stone, and there was enough moisture in the sand and stone to damp the cement.
260. The concrete was not wet until it was required to be used? No more than I have explained.
261. With regard to your position—you are a third-class inspector, are you not? You and Mr. Hickson say in your returns that I am a second-class inspector.
262. During the time you were employed upon Contract 79 you occupied a subordinate position? I was second to Inspector Fowle. He would be there in the daytime, and he would leave me in charge at night.
263. You carried out his directions? As far as I could.
264. You were there to do as you were told? Yes.
265. How long have you been employed by the Department? I started in the Sewerage Department in March, 1891.
266. How long have you been off the work? About three months.
267. You have been pretty continuously employed in the Department from February, 1894, until within about three months ago? As nearly as I can remember, it is about two years and three months since I was moved from Contract 79 to Contract 89. When I finished Contract 89 there was not a vacancy.
268. With brief intervals you have been employed in the Sewerage Department until quite recently during the period you have named? Yes.
269. You say that you experienced trouble on Contract 79 in getting the work carried out in accordance with the specifications? Yes.
270. I presume that as an inspector you always, speaking generally, experience more or less trouble? Yes.
271. In fact you are there for the express purpose of insisting on the work being carried out according to contract—is that so? Yes.
272. Coming now to the defective work. The first that you mentioned was a little before or a little after Christmas, 1893? Yes.
273. You state you objected to the filling of the shafts being left until the shafts were built? That is what the contractors' representative told me. I did not object to it. He merely told me to tell Inspector Fowle, who was in charge of the job.
274. The conversation to which you refer had reference not to packing, but to filling—that is, filling the space between the sides of the excavation with earth? It was with reference to the packing of concrete between the brickwork and the walls of the shaft.
275. Do you mean to say that Mr. Reid told you he would leave the whole of the packing from the top to the bottom until the whole shaft was built? He asked me to inform Inspector Fowle that that was his intention.
276. Did Foreman Reid do as he said he would, or did you get your way? I did not place any confidence in what he said, or I should have reported it on paper.
277. As a matter of fact, the work was carried out according to specification in that instance? Yes.
278. I will come now to the defective work at the end of January, 1894, when you say you saw 2½ barrow-loads of dry metal put down a shaft? I was about 20 or 30 feet away from the men. I had Nos. 5 and 6 shafts to look after. I saw them pack at No. 5, and I walked along to see the remainder of the packing at No. 6. The engine-house was right between No. 5 and No. 6 shafts, so that I had to walk along the reserve fence. When I got to within 20 or 30 feet of Connors and Dawson, I saw they were shovelling down the dry stone from a stack which had been carted there to be mixed into concrete.
279. Will you swear that 2½ barrow-loads were put down the shaft? About that.
280. Did you stand there and allow it to be done? I stood there to satisfy myself.
281. You allowed them to put down 2½ barrow-loads before you objected? From the time I first saw them until I was convinced that they were shovelling in dry stone I should say that they put in 2½ loads.
282. After you had seen the 2½ barrow-loads of dry stone put down the shaft, did you go down to see what had been done with it? No; there was no engine-driver there, and if I had gone down I could not have been more convinced than I was that dry stone was being put down the shaft.
283. Were you not stationed there for the purpose, and would it not be a part of your duty to go down the shaft to see what was being done with the dry stone;—you were there to see that concrete was put in? I could not go down a shaft of 200 feet if there was nothing to go down in.
284. How did the men get up and down? There was no driver until about 7 o'clock.
285. At what time did you see the stone put down? At about half-past 6.
286. Did you go down at 7? No.
287. Why not? I did not think it necessary to go down the shaft. I had already seen the stone sent down, and they had thrown down a certain amount of dry compo.
288. Do you say that after putting down the dry stone they put down in addition a certain amount of dry compo.? They did, and they asked me if that would not satisfy me. I said, "No; it must be concrete."
289. Do you mean to say that after you had spoken to the men you did not go down the shaft at all to see what was being done below? I did not.
290. Then for aught you know the work down there was being done all right? It could not be right.
291. You say you saw dry stone put down, and you tell us that you also saw them put down dry compo.;—what reason had you for supposing that the dry stone and the compo. was not put into the work in the form of concrete;—can you say whether that was or was not done? I do not know how much stone had gone down before I saw them, but I made a note in my pocketbook of about 2½ barrow-loads, so that I might make quite sure. There may have been two cart-loads.

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292. But you do not know what was done below;—you say that the driver was there half an hour after you had seen the men putting down dry stone;—why did you not avail yourself of the opportunity to go down then? Well, the shaft being naturally wet, the compe. which had been put down would be mixed among the stone.
293. Practically then you had every reason to think that the work was all right, and that is the reason you did not go down? I had every reason to think that the work was all wrong, or I would not have reported it.
294. Coming to the other occurrence which you reported to Inspector Fowle on or about the 10th February, you told the Commission you objected to dirty metal, and that you asked the contractors' employees to use the fork;—can you tell me whether that metal had been forked previously? I could not say if it had been forked, but if so, it had been very badly forked; it was very dirty.
295. Supposing the metal requiring to be forked had been forked when you came to the last of it, would the forking take out the dirt—would it make the metal clean? It would take away all the quarry refuse and dirty sand.
296. That was the dirt you objected to? Yes, and there were bits of root in it, and it had been trampled over; it was the last of the heap.
297. What was the result of your action when the dirty stone was put down the shaft;—was it used? It was put down the shaft.
298. Should you not know whether it was used or not;—were you not there for the purpose of seeing? Certainly it was used; it was mixed with cement.
299. To what extent? About half a gauge; about 10 cubic feet.
300. Before the reports to which you have referred this morning as reports No. 1 and No. 2 was there any friction between yourself and the employees of the contractors? There was not any friction so far as I was concerned. I had never seen some of them before.
301. Would you not regard what you told us this morning about one of the bricklayers threatening to run the trolley over you, and about your being pulled up the shaft much faster than suited your sensibilities;—would you not regard that as evidence of friction? That was by a different man altogether.
302. But I am speaking of the contractors' employees generally? I looked at my being pulled up the shaft as a joke between the men. I did not consider that the contractors had anything at all to do with that matter.
303. The inference from what you said about your being pulled up the shaft was that obstruction, so to speak, was being put in your way by the contractors and their employees? You may look upon it in that way if you like.
304. As a matter of fact, was there not difficulty from almost the first moment you went to the contract until you were removed in February between yourself and the contractors' employees? There was no difficulty so far as I was concerned. I would not allow the men to pack the brickwork in the way they wanted to.
305. Beyond the dirty metal which you reported in February, and the dry metal which was put down the shaft on the 31st January, concerning which you have some suspicion, do you know of any defective work upon Contract 79? I only know of one other matter—a brick was broken, and I mentioned it to Inspector Fowle. He took the engineer down and he said "Let it be the worst." A brick in the arch was chipped.
306. *His Honor.*] Do you mean on the outer or inner side of the arch? A piece was taken off half-way along the brick. The bricklayer did it when he was driving the key-brick up. It was an accident.
307. You know as a matter of fact that at the time you were removed from Contract 79 to Contract 89 the foreman bricklayer was removed too? That I could not say.
308. Do you know Inspector Eyre? Yes; I have met him on different works.
309. I suppose you regard him as a fairly good man? I have not a chance to know. I have never been with him.
310. *Mr. Carter.*] You said this morning that you received intimidation on one of these contracts? I did not say that, but you can draw your own conclusion.
311. Did that come from any member of the firm, or did it come from some of the workmen with whom you were quarrelling? I do not know that I ever quarrelled with any man on your jobs.
312. *Mr. Parkes.*] Your quarrelling with the men, in so far as you did so, was only from your insisting on the work being done in a proper manner? That is all.
313. Did you ever have a conversation with Mr. Davis in connection with your removal to Contract 89? Yes.
314. What did he say to you? He came out there after my removal, as he usually does, making the round of the different jobs. He came up to me, and said, "Well, Reid, how are you getting on here?" I said, "Very well; I have nothing to complain of on this job; but there is a little matter I would like to understand. If I have been too severe on Contract 79 it would be just as well for me to be informed of it, because I do not wish to be severe." He said, "Nothing of the kind, Reid; you have done quite right." I said, "If I have done quite right I do not think it is fair for me to be removed over here." I explained that I lived close to Contract 79, on North Shore, and I did not see why I should pay the boat, tram, and train fares out to Lewisham. Mr. Davis said, "Well, I cannot help it; the Department will not pay your expenses." I thought it very hard that he, the engineer, should endorse my action upon the contract, and yet that he should shift me from it to another contract, where I had to pay boat, tram, and train fare.
315. This morning you stated that you were for a certain time at the end of one of the drives;—what were you doing there? I was superintending the building and packing of the brickwork.
316. With regard to the putting down of bad material, you had no means of stopping the men who were engaged in doing so except by reporting the circumstance to your superior officer? That is all.
317. You did that? Yes.
318. Did they take the matter up and deal with it? Mr. Davis held an inquiry in the company's office, at North Shore. Inspector Fowle, Mr. Boys, Mr. Carter, and Mr. Snodgrass were present.
319. You took due care in every case to report bad work? Yes, either verbally or in writing.
320. And they did not act on your report? They held inquiry.
321. Was incompetence, or any other reason, assigned for your removal from the contract? Never.
322. With reference to the inspectors going down the shaft, is it not imperative that the contractors should provide means for their going down? I am not sure about that.

- R. G. Reid. 323. *His Honor.*] Cannot you be a little more explicit about the occasion on which you noticed dry metal being sent down;—it was for the filling at the back of the shaft. was it not? The shaft was in sandstone rock, and the space between the brickwork and the rock had to be filled with sandstone concrete.
- 27 May, 1896. 324. What stage of the building up of the shaft had been reached at that time;—how is the shaft built up from below after it has been completely excavated? It is brought up over the crown of the drive, so that it goes right down into the sewer. It is brought up with a wall 9 inches thick.
325. At the time to which you refer, how far up had the shaft been built? At that time I should say they were from 100 to 150 feet from the top—in other words, they were up about 50 feet. The rock at the sides would project at various points, touching the brickwork. If the brickwork is built up above one of these points, it stands to reason that the cavity left below cannot be filled. If the inspector sees that the bricklayer is coming up to this projecting part of the rock, and that he is blocking the chance of filling the cavity below, it is his duty to call attention to it, because when the brickwork is carried above the projection the packing below cannot be done.
326. The packing is sent down ready mixed, I suppose? Yes. The concrete is mixed on a large board alongside of the shaft, with a shoot going down from the end of the board, so that the men have only to shovel the concrete along the board and it drops down the shaft. The men then go down, and put the concrete in for the packing.
327. The concrete ought to be sent down wet—that is, ready mixed? Yes. There is so much weeping in some cases from the sides of the shaft that if the concrete only lies on the board a few minutes it is wet.
328. You say you saw two and a half barrow-loads of broken sandstone going down dry? Yes.
329. The other components would be sand and cement? Yes.
330. How did you know that these components had not been sent down first, and that the men were not going down to mix on the board below;—did you see any other material sent down after the dry stone? I saw a few shovelfuls of compo., left after the bricklayers had finished using it, sent down.
331. Did you see anything else go down? They had half a batch of concrete ready mixed on the board, and they sent that down.
332. After sending that concrete down, did they send a man down? Yes; afterwards.
333. What did you assume was being done down below;—did you assume that the concrete was being made up, and that there was too much metal? I assumed that the proportion of cement specified was not in the work.
334. And that the sandstone was present in an unduly large proportion? Yes; if they wanted packing, why did they not use the half batch of concrete which was on the board before sending down the dry stone?
335. The concrete on the board was in proper proportions? Yes. From where I stood I was in a position to see clearly that the men were not shovelling down concrete. They were shovelling down material from a heap of dry stone.
336. When you went over to them did you at once speak about it? I said I should have to report it.
337. Did you not ask for an explanation from the men? I asked for a explanation, and they said they required only half a batch. I said, "Why not use the half batch which you have on the board?" That was afterwards used.
338. After the concrete had been sent down a man would have to be lowered to put it in position? Yes.
339. And you say you saw the man go down? Yes.
340. You did not go down yourself? No.
341. You could have got one of the men to lower you down? I could; but I did not think under the circumstances that it was safe for me to go down, as neither of the men were engine-drivers, and if I had gone down I could not have been more convinced than I already was that dry stone had been sent down.
342. *Mr. Davis.*] I should like you to say definitely what you saw which you thought radically wrong;—you say you did not follow up what you saw by going down the shaft and seeing what was being done below? No; I could not be more convinced than I was that dry stone had been sent down.
343. Did you think that simply telling the foreman bricklayer that you would report him sufficient action for you to take? I could not have done more if I had gone down.
344. You said just now that a labourer went down to put the concrete in position after the material had been put down the shaft;—why did you not go down with him? I did not consider that I had any right to risk my life with a man whom I had caught in an act of roguery. I did not think I ought to risk my life with men like that.
345. As a matter of fact, was there not a good deal of friction between yourself and the workmen of the contractors? There was no friction at all in the ordinary sense. Of course, if a man has been proved to be in the wrong—if he has been caught red-handed in wrong-doing—there is bound to be a certain amount of friction.
346. Can you say conscientiously that there was not a good deal of personal feeling between yourself and the contractors' workmen? There was no personal feeling between myself and the workmen. Some of them I had never before seen in my life. Some of them I had seen on different other works, and I was friendly with them.
347. Did it not occur to you that the Department was extending you a considerable amount of consideration in removing you from a contract upon which you had so much personal animosity to contend with? It certainly never occurred to me to suppose that the Department was taking me into consideration. If I was in the right I thought the Department ought to have left me on contract 79, and if I was wrong I thought I ought to be dismissed.

FRIDAY, 29 MAY, 1896.

• Robert Rowan Purdon Hickson sworn and examined:—

- R. R. P. 348. *Mr. Parkes.*] What is your position in the Department of Public Works? I am Under Secretary for Public Works and Commissioner for Roads.
- Hickson. 349. What was your position on the 22nd February, 1894? I was Commissioner for Roads and Engineer-in-Chief for Sewerage.
- 29 May, 1896. 350. It was you who decided, I believe, that Inspector Reid should leave Carter, Gunmow, & Co's. work? To leave that contract—yes.

351. Why did you so decide? Because I had come to the conclusion that it was in the interests of the work, as well as in the interests of the man himself, that he should be removed.

352. Before you decided that, you sent for Mr. Carter? Yes.

353. You and he had an interview? Yes.

354. What took place? I asked Mr. Carter to come in on account of the complaints which had been made to me with regard to the friction which had taken place upon the contract. The complaints were made to Mr. Davis, the supervising engineer, and he made an investigation, the result of which was very unsatisfactory. We could not put the blame of the friction upon any special person, and, after consultation with Mr. Davis, I came to the conclusion that the best thing would be to move the inspector and also two of the contractors' men who I thought were equally responsible for the friction. I sent for Mr. Carter and told him what I thought of doing. He did not like the idea of his men being removed. However, I told him very clearly that that was what I intended to do. I also moved Inspector Reid from the contract, sending in his place an equally good, if not a better man.

355. According to the minutes, you saw Mr. Carter before you arrived at that decision? Not before I came to a decision in my own mind.

356. Why should you send for Carter? I wanted to see him, and to hear what he had to say about the matter. I had practically decided to remove two of his men, and I wished to give him a chance to make a statement.

357. Mr. Carter has said that he never was upon the job; why, therefore, should you send for him? Because he was at the head of the firm; he was the only member I knew of.

358. Did Mr. Carter request the removal of your own officer? I am not sure that he actually put it in that way. I think he said that as long as Reid was there there would be friction. He expressed a desire for the withdrawal of Reid—at least, I so understood him.

359. Would it not lead you to think that Inspector Reid was preventing the men from doing bad work? Certainly not.

360. Not when Inspector Reid was constantly reporting to you that bad work was going on? He never was reporting anything of the sort.

361. Did Inspector Fowle not send you the reports of Reid? Yes; I saw some of his reports.

362. Have you not a regulation in your Department rendering it imperative that men who do foul work should be removed from all Government jobs, and should not be allowed upon them again? There is no standing rule.

363. It is a regulation, is it not? It is not. But we do so; we have removed men.

364. Is it not, in the interests of the State, wise to remove men for doing foul work? Yes.

365. When you had these reports before you why did you not remove them then? I did send away two of the contractors' men. But I am not aware of Reid reporting bad work. He said himself the other day that he knew of no bad work that was done. What he mentioned was that some broken stone not mixed with cement was thrown down one of the shafts. He spoke to the men very strongly about it, I believe; and I think he was very wrong in not following it up. That was one of the reasons which led me to think that it would be better for the Department to have a better class of inspector at the work.

366. Did you act upon his former reports? The reports would all come through the supervising engineer. We consulted from time to time as to the best thing to do.

367. Did you assist your inspectors? In every way.

368. Did you remove the men who were doing bad work? What men?

369. The men who had been reported? It was on the strength of some of the reports that I removed two of the men.

370. After many appeals on the part of your inspectors? After the matter had been thoroughly investigated by Mr. Davis on the spot.

371. You admit that you ignored former reports? I do not. I should like to see the reports to which you refer, so that I might know those upon which no action was taken.

372. As a matter of fact, did you not permit the contractors' men who were removed from the job to go on to other works of the Government under Carter and Gummow? My decision was that they were to be removed.

373. But you allowed them to be removed to another work of Carter, Gummow, & Co.? As a matter of fact, I did not know that they had been shifted to another job.

374. Did you not similarly remove an inspector named Harris from one of Carter, Gummow, & Co.'s jobs? I do not remember the case.

375. Did not you similarly remove an inspector, named Wagg? Which contract are you alluding to?

376. I cannot say. A question was asked in Parliament about the removal of inspectors—do you not remember that? I cannot call the cases to mind at present.

377. Cannot you recollect the removal under similar circumstances of Inspector Harris? I cannot. We are continually removing inspectors backwards and forwards from one work to another. It is a very common thing to do. I cannot tell you what was the reason for the removal of the inspector you mention from some unknown contract.

378. You are sure you did not remove Inspector Harris from any one of the works? I believe Harris has been removed backwards and forwards.

379. But, I mean for similar reasons—that is, on a complaint by Carter, Gummow, & Co. of him? I have no recollection of it now. If you could let me know the number of the contract I could tell at once.

380. Do you recollect furnishing an answer to a question which I asked in Parliament on 9th October, 1895? Not by the date.

381. I suppose Mr. Young would refer all questions to you for answer? It is very likely.

382. The reply you furnished on the occasion to which I refer was that only one inspector had been removed from Carter, Gummow, & Co.'s works, viz., Inspector Reid? I do not remember the question. So many questions are asked in Parliament that it is impossible to carry the whole of them in one's head.

383. You represented to Parliament that Inspector Reid was removed because of friction with Carter, Gummow, & Co.'s manager and foreman;—that is the only reason you offer? Yes.

384. As a matter of fact, what remedy have your inspectors got other than appealing to you to have their orders carried out? The first remedy is to see that the thing is done on the spot. If that is absolutely refused, then of course they would go to their superior officers.

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385. Supposing that they endeavour to see that the thing is done, and that it is absolutely refused, what are they to do then? Then they could appeal to me.
386. Did you never receive a report from Inspector Fowle that it was almost impossible to get Carter, Gummow, & Co.'s men to do any work on account of their obstinacy? I have no recollection of any report to that effect.
387. Do you not consider that in the interests of the public you should have very firm inspectors on these works? Most decidedly.
388. Do you not think that when it comes to the question of paying away public funds to contractors, and your inspectors complain that the work is being scamped, that it is your duty to see that the men who are scamping are removed, and that the bad work is also removed, and proper work substituted for it;—do you not think you ought to uphold your inspectors? Most undoubtedly.
389. Is it your duty to remove them simply because they have friction with the men in the discharge of their duty? I certainly would remove them if there were friction.
390. If you remove them because there is friction between them and the men, is that not an act of grace to the contractors;—is it not assisting the contractors? I do not see in what way it is an act of grace to the contractors to dismiss some of their men.
391. You asked not for their dismissal but merely for their removal from one contract to another? I was not aware at the time that they left the work to go to another.
392. You have nothing against the character of Inspector Reid? No; Reid is a very fair inspector; I think he is an honest conscientious man; he is injudicious; that is the only thing I can say about him.
393. In what way? Well, in regard to the friction that was going on. There was a good deal of what one might call skylarking and larrikinism going on there. For that reason I thought it well that he should be removed, both for the sake of the work and for his own sake.
394. What do you mean by skylarking? Well, I mean such incidents as the men playing tricks with him when he was going up the shaft.
395. Do you call it skylarking that men in Reid's position should have their lives endangered by the action of men in regard to whom he had simply done his duty? It is remarkable that he is the only man in the whole place who made such complaints.
396. Did you never receive complaints from any other of your officers as to the way in which they were treated by the men? I do not recollect receiving any.
397. Did you ever go upon Contract 79A? Very little of it was carried out under me; I may have been on it once, but I do not think I was.
398. Do you generally examine your own works? As well as I can; of course there is very little examination that the head of a Department can make personally; he depends upon his officers.
399. Would you not consider it a case requiring your own special examination when complaint had been made by an inspector that every step he took was met with an attempt to get in defective work? I do not acknowledge the truth of the statement that attempts were made to get in defective work, and in the second place I had the principal assistant engineer whose duty it was to supervise the whole of the contracts, besides the resident engineer; these are the men who go into all these details; I could not afford the time to go into these matters and examine all the disputes that arise.
400. Of what do your duties consist? Of managing the branch of which I am the head.
401. In what way? In the office, looking after all the details of the office.
402. Do you mean clerical work? I think an engineer in this Colony is almost a clerk; there is so much clerical work to be done in the office; 95 per cent. of his time is occupied in that way; it is for that reason that we got the principal assistant engineer to do the outside work.
403. You have plenty of officers, I understand, to do the clerical work necessary? Not the clerical work I had to do.
404. Do you write many minutes yourself? A great number.
405. Do you examine your own plans? Yes.
406. But you have any number of officers;—you are not limited in that regard; therefore I should think you would have time to go out and look at the works? I had no time for that. My officers do the outdoor work. I find that I have quite enough to do in supervising all the work in the office, writing reports, answering questions, and being at the same time in constant communication with the Minister on various points.
407. You do not think it part of your duty to go and see periodically works upon which large sums of public money are being expended? It is my duty to do so as often as I can consistently with the discharge of my special duty of managing the Department and the office. I have all the accounts to look after. I have to sign all the cheques for payment, and that in itself is a very big business.
408. First of all, do you satisfy yourself as to what the cheques are for;—do you look through the quantities and the voucher before you sign the cheques? No.
409. You rely implicitly upon your officers? I must do so at times, especially when there are contracts passing through my hands at the rate of twelve a day.
410. Therefore you have not any responsible work? Yes, I have.
411. But if you never look into your contracts and the payments you make you cannot be doing responsible work? I do look at the plans, and I do look at the contracts whenever I can spare the time.
412. Do you look into the items you have to pay away? I go upon the signature of the responsible officer, the accountant, as to the correctness of the additions, and upon that of the supervising engineer in regard to the correctness of the quantities.
413. And you never compare the contracts with the payments you make? Only in the lump sum. No head of a Department would have time to do more than that.
414. It would not take so very long to make a cursory comparison—merely looking down your quantities? It would be physically impossible for me to do it, taking that work alone as the work of my office.
415. *His Honor.*] Having given this evidence, so far as it has gone, is there anything more you can think of which you wish to mention in relation to the same subject matter as that upon which you have been cross-examined? I do not think so.
416. Did you in fact voluntarily and knowingly allow any defective work to be done;—or knowing that defective work was going on, did you permit that work to go on on any occasion? No, certainly not.
417. Knowing defective work to have been done on any occasion, or suspecting that defective work had been



been done on any occasion, did you allow that work to remain in a defective condition without having it set right? Certainly not. Perhaps I might be permitted to say that there is no allegation of defective work in regard to Contract 79.

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418. Is the work between shafts Nos. 12 and 13, in Alfred-street, North Shore, part of Contract 79 or 79 A? 79 A.

419. Do you wish to make any explanation with reference to Contract 69? It was carried out strictly according to specification. It was not concrete packing.

420. Do I understand that in the specifications it was provided that concrete or other material of which the Engineer-in-Chief might approve should be put into the cavities, or some words similar to that? I should like to see the specification. I am not quite sure whether it was written before the old system was abolished or not. Having looked at the papers, I see that it is one of the contracts under the altered specifications. I should like to refer you to page 85 of the Parliamentary paper ordered to be printed on 22nd October, 1895. You will see there a schedule to specifications. That schedule of specifications is put with every contract that is let on the sewerage works. It does not follow that the whole of it applies to each contract, but in the specification written before that the clauses intended to apply are referred to.

421. In regard to Contract 69, the tunnel, I understand, was through shale, and Dawson said that the filling over the crown was done with shale instead of with concrete;—the question is with what material the filling was to be done? I take it that the filling is to be done in conformity with clause 87 of the specification to which I have first referred.

422. Does that clause apply to open cuttings as well as to tunnels? Yes; because there is the packing in between and the open cutting as well.

423. What is the meaning of these words "the spaces between the excavation (poling boards where there are such) and the brick or concrete work of sewer in tunnels unless otherwise directed to be filled in with concrete;"—do those words not apply to the whole of the inter-spaces over the crown as well as the sides between the sewer when constructed and the excavation? They would apply to the whole thing unless otherwise directed.

424. Then the words "unless otherwise directed" are very material? Yes.

425. Do you know, in point of fact, of your own knowledge, in regard to the particular sewer spoken of by Dawson in Contract 69, what directions were given by the engineer in charge as to the material which should be used in the filling over the sewer? It was to be filled in with shale.

426. Do you know that of your own knowledge? Only from what the engineer told me.

427. From reports formally made to you? Yes, by the principal Assistant Engineer.

428. Of course, you are an engineer by profession? Yes, I am a member of the Institute of Civil Engineers.

429. Speaking as an expert, what would you say as to the propriety of using shale, for instance, under these circumstances—would shale of this quality be a proper material for filling as a substitute for concrete? It is a proper material for filling. You can hardly call it a substitute for concrete, because it is so totally different.

430. I mean, what do you think of its use instead of concrete? Certainly it can be so used.

431. *Mr. Parkes.*] Where you have rock you do put concrete, do you not? It used to be the custom; it is not so now.

432. In this contract is it so? Yes.

433. Where you have shale you have put shale filling? Yes.

434. Is not shale considered a material of a more or less soft nature, as compared with rock? Yes.

435. Would it not naturally follow that if you put concrete where you had rock it would be more necessary to put concrete where you had shale? It does not matter what opinion you may form. We have the specifications to go by, and, as I have said, we are giving up putting concrete in at all round the top of our sewers even when we are going through rock. The last few contracts which have been let, not immediately under me, provide, I believe, for filling with sand.

436. Why did you provide for the concrete then? It was the old custom, and by degrees in the course of the various works we have come to see where improvements can be made in the way of cheapness.

437. Have you ever seen 10 feet of the city streets blown up with the pressure of storm-water? I never saw it here, although I believe the Tank Stream was once blown up.

438. Have not the sewers of the city often burst up the streets? I never saw it myself.

439. Is this sewer not supposed to sustain a very heavy pressure from within? No.

440. Not when it is charged with water? No, it is calculated to a two-thirds flow.

441. Are not the street drains turned into it? But there is an overflow to meet that.

442. Supposing there were extraordinary rains and the sewer were tested to the uttermost, would it not be necessary to have it in firm packing? We do not consider so now.

443. *His Honor.*] How is the packing put in when it is done with any material other than concrete? A brick sewer is carried on in advance of the work to a certain length, say about a 4-ft. length, and the packing is pushed in from the front with a wooden spade. The material is packed in with this spade as tightly as it is possible for a man to press it in.

444. *Mr. Parkes.*] What effect would the natural weep in the case of this sewer have upon the shale? It could not have very much, because the material cannot get out.

445. If the shale became sodden with water, what effect would it have? The same effect as on the shale all round it. The strength of the sewer is not dependent in any way upon the concrete or shale at the top. The sewer is calculated to carry its own pressure, and to be watertight in itself.

446. *His Honor.*] It is all one piece on account of the quality of the cement—that is to say, the bond is supposed to be perfect—to make it one piece? Yes.

447. *Mr. Parkes.*] Your specifications say the contractors shall not deviate from their work except upon writing? Yes.

448. Did you write an order for the alteration of this material? We are not very strict on any of our contracts as regards a written order. As a rule, these things are fixed up on the ground when the engineer is going over the work with the contractor.

449. An inspector, then, could alter the concrete to shale at any time? Not an inspector.

450. But you could do so? Yes, and my supervising engineer also.

451. Therefore, although it is said in the specifications that it is imperative that the alteration should be in writing, it does not matter? That clause is honored more in the breach than in the observance.



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452. *His Honor.*] Is it or is it not possible to pack with broken sandstone rock?—is there any distinction between the possibility of satisfactory packing with shale and satisfactory packing with sandstone rock? I understand you to say that you never pack with sandstone rock where there is shale—is that so? Not in shale.

453. Do you in the sandstone itself? No; I have never done so.

454. Is there a reason why shale can be satisfactorily used for packing and why broken stone cannot? Broken stone will not lie so close. You could not fill in the interstices with broken stone, but you can pack shale very close.

455. Shale when broken up in the ordinary way in an excavation can be used for packing as well as clay or sand? Yes.

456. *Mr. Parkes.*] If shale were used would you pay for it as concrete? Certainly not.

457. *His Honor.*] Will you give us a definition of the word "lining" as you understand it in the specification? I take it to be part and parcel of the sewer proper.

458. The perimeter of the cylinder so to speak would be the lining? The word sewer would explain what is meant.

459. Your definition of "lining" then would be the material of which the barrel itself is formed? Yes. If you look at the end of my minute on page 305 you will see the word "packing" used in its proper sense.

460. The material question now is, what was actually done by the department in relation to the contractors in respect to the packing over the lining—was the shale which was used as described by Dawson properly or improperly put in. Was it done with or without the consent of the department? It was done according to specification; and, as far as I know, it was properly put in. I cannot say whether it was properly done, because I was not on the spot.

461-2. If the packing was put in with shale would the contractors be paid for anything along that part of the sewer except the shale packing—that is, except at the rate for shale packing—for packing with material other than concrete? It would be paid for at the rates set down opposite that item.

463. I understand this contract was one of those in the old form, which I was informed the other day had since been modified by another department, under which the contractors tendered for each separate kind of work at a separate rate, and estimated their total of the quantities which the department had formerly taken out and informed them of? That was the form, your Honor; but so far as the alteration being made by another department is concerned I might be allowed to state that I made it myself.

464. Contracts 79, 79 A, and 69 are all under the old regime? Yes.

465. *Mr. Parkes.*] I observe from the papers that in regard to Contract 69 there is an excess paid on concrete to the extent of about £2,000; can you produce the written instructions which of course would be recorded to substitute shale for concrete packing? This voucher did not come under me at all, so that I cannot give you any particulars; it was out of my hands before the date named there.

466. Mr. Darley's only work in connection with this contract seems to have been to issue the final certificate—a merely perfunctory work. You yourself had charge of the work;—when did you actually hand it over to Mr. Darley? I think I gave him charge on 1st April, 1895.

467. The final vouchers were given in July, were they not? The date of the one you have handed me is the 25th October.

468. That voucher would not be issued until many months after the job was completed? The measurement is made up on a certain day and the voucher is made up as soon afterwards as possible.

469. As a matter of fact was not the work complete before Mr. Darley took it over? No.

470. The date of signing the contract was 22nd January, 1894? Yes.

471. It had to be completed in what time? In eighteen months.

472. As a matter of fact was it not completed in July, 1895? I could not say; I was not then in charge. I gave up charge on the 1st April, 1895.

473. How long had Mr. Darley to administer this contract? From 1st April, 1895, until it was completed, apparently in October.

474. But practically the work was done under you? Most of it.

475. I would like to ask you whether you ever built a sewer in the city of Sydney without a brick-ring lining? Yes; I think we have built some with concrete all round.

476. Where? I should not like to say definitely without refreshing my memory, but I think we did build some.

477. In the case of this particular job is it specified to be in brick ring throughout? I think so.

478. Then the excess of concrete that is put over the brick ring is, I suppose, in order to provide against bad ground? There is not any excess of concrete. Other material was substituted, and in this case it was shale.

479. Why do you say that where the material is more or less soft the packing shall be increased? We have to provide for all sorts of contingencies. I may say that in starting these sewerage works we cannot tell the nature of the ground we shall meet. Therefore we have to specify for all sorts of contingencies—hard ground, soft ground, a good deal of packing, little packing, several rings or one ring, as the case may be, and as the work goes on it is determined by the officer in charge what class of work shall go in at particular places. We have items in our schedule of prices to meet the various circumstances that arise.

480. Is not shale a more or less soft material? We get all sorts of shale; some has to be picked, and some will come out quite easily.

481. You use the words "more or less hard material," I see—what do they mean? There is hard clay and soft clay, hard shale and soft shale; soft shale would be more or less hard material.

482. You say hard and soft shale? Some shale would go over soft rock, because you have to blast it?

483. In the specifications it is provided that there shall be an excess of packing in more or less soft material? Yes, there would have to be a larger packing.

484. *His Honor.*] Would you extend the tunnel then in soft material beyond the necessary size, so as to allow for a greater thickness of packing? No. If the material is very soft you have to make it larger than is absolutely necessary, because of the timber which has to go in it; if it is hard material you can cut it out to the exact size.

485. It is not because you want to get a ring of tightly-rammed and solid material round the barrel that you put in more packing, but because you cannot help yourselves—that is to say, you have to take out more stuff than you would need to take out if the material were harder, and would stand better;—it is

not

not with the object of protecting the barrel that you put in the greater thickness of packing? No; you have to make up the space you have taken out.

486. I want to understand this perfectly;—where you use concrete to a point half way up and then put in a brick crown, how do you do the packing of the lower part, supposing you cannot cut the tunnel perfectly true? It is all done in one operation. The sewer is cut out roughly, and of course, the space must be filled in.

487. What I want to know is, how the contractor is paid for the concrete he puts in in that way;—is he only paid for the quantity which would require to go in if the excavation were cut true? You have to fix a limit. We know that the tunnel cannot be cut to the exact size, and we give a limit which was settled a great many years ago, I think, at  $4\frac{1}{2}$  inches. If the contractor goes beyond that, he has to fill it up at his own cost.

488. But he must bring the concrete right up to the excavation? Yes.

489. Where the tunnel is built entirely of brick right round, what is the practice adopted;—how is the lower part of the brickwork laid? It is packed with concrete as we come up with each brick. The concrete is brought up with each course of brick.

490. In all cases there is a wooden drum or frame fixed somehow in position where the centre of the core would come, round which the bricks are laid? Yes; and as each course of bricks comes up, the concrete is put in.

491. From the spring, the bricks, of course, are laid on the drum, and when they are set the filling is put in? Yes.

492. Cement being used, the setting is practically instantaneous? Yes; almost immediately the brick-layer has done his length, the ramming can go on.

493. The stability of the whole concern rests upon the quality of the bricks and the quality of the cement? Yes.

494. The stability does not depend upon its surroundings—at any rate upon its upper surface? I would not go so far as to say that it does not, because the packing prevents any possibility of the thing rising up.

495. But what you may call the detailed stability is enough to make it unnecessary to put in particularly hard material so as to keep each particular brick in position;—the general firm pressure is sufficient? Yes; and the practice now is to fill up the space with sand.

496. There being a general firm pressure all round? Yes.

497. I understand that this sewer will take the storm water down the gully shafts? A certain proportion.

498. A limited proportion? Yes.

499. The limit being calculated on the grade and section of the sewer? Yes; along the main line of sewer there are overflows into storm-water channels.

500. Discharging at convenient points so as to run out in comparatively short distances? Yes; they are all brought to some river or creek.

501. I suppose they would be two-thirds of the way up the sewer? Some are two-thirds, and some are three-quarters.

502. That would prevent any chance of the sewer bursting from hydrostatic pressure? Yes.

503. Is there anything further you wish to state? We started upon the question of defective workmanship. The defective workmanship complained of upon contract 79A was done at a place that was not under my care at all. I had not charge of the sewer at the time.

504. Will you explain that place, and the date at which the work would have been done? My last voucher upon contract 79A is dated 20th March, 1895. I am not in a position to say the exact date at which the part of the sewer which was examined yesterday was done, but the engineer-in-charge would be able to say. I am informed that it was a long time after the date I have just named.

John Henry Harris sworn and examined:—

505. *Mr. Parkes.*] What is your occupation? I am a bricklayer. I am an inspector at present under J. H. Harris, the Sewerage Construction Department.

506. Were you an inspector under Mr. Hickson? Yes.

507. Were you ever an inspector upon any of Carter, Gummow, & Co.'s contracts? Yes; on one of the first sections at North Shore?

508. Would that be Contract No. 79? Yes.

509. Had you any reason to complain of defective work? No; I do not think so. There were once some hollow joints in a manhole, to which I called attention. The bricklayer had done the work on a night shift. The joints were afterwards attended to.

510. Did you ever make any complaint of Carter, Gummow, & Co.'s work? Not in reference to the work done.

511. Was the work generally good? Yes.

512. Were you removed from the job? Yes.

513. What was the cause of your removal? Other work came in at the time.

514. It was not because you had any quarrel with any of Carter, Gummow, & Co.'s men? No.

George Wagg sworn and examined:—

515. *Mr. Parkes.*] What is your occupation? I am an inspector under the Sewerage Construction Branch.

516. Were you ever an inspector under Mr. Hickson when he had charge of that Department? Yes.

517. Were you employed upon Carter, Gummow and Co.'s contracts? Yes.

518. Had you any reason to complain of their work? In what way do you mean?

519. Had you to complain of defective work? No.

520. Had you ever a quarrel with Carter, Gummow & Co.'s men? That happens on pretty nearly every job; there are bound to be differences of opinion. It is impossible to get through the work without them.

521. Were you ever removed from Carter, Gummow and Co.'s contracts? No.

522. You were never shifted to another job? No.

523. *Mr. Hickson.*] As a matter of fact, are you not an inspector upon one of their contracts now? Yes.

Robert

R. R. P.  
Hickson.

29 May, 1896.

29 May, 1896.

G. Wagg.

29 May, 1896.

Robert Rowan Purdon Hickson recalled and further examined:—

- R. R. P. Hickson.  
29 May, 1896.
524. *Mr. Parkes.*] Did you not start Contract 79A? Yes.  
525. Where would the contract start from? From the junction with Contract 79.  
526. Does not Contract 79A commence at Mount-street? Yes.  
527. *His Honor.*] Shaft No. 12 would be at the junction of Contract 79 and Contract 79A? Yes.  
528. *Mr. Parkes.*] How far was that work carried on when you handed over the job to Mr. Darley? could not tell you that.  
529. Was it half-way through? Probably about half-way through.  
530. As a matter of fact, you were in charge when the work was done at shafts Nos. 12, 13, 14? I could not say from memory how this work was carried on, but I was told this morning that the work examined yesterday was not done under my supervision.  
531. *His Honor.*] Was Contract 79 completed before 79A was begun or not? Yes; I think I completed 79.  
532. *Mr. Parkes.*] Then when you swore this morning that that contract was not under your charge the statement was not correct? I did not swear anything of the sort.  
533. *His Honor.*] I understand you to say that you understood that that particular portion of the work was not done under your supervision? Yes; but Mr. Parkes mentioned the contract.  
534. The question is when the work in Contract 79A was begun? I cannot tell when the lining of the tunnel at the point examined yesterday morning, and alleged to be defective, was made. I think Dawson said it was about July, but I gave up charge of the work on the 1st April.  
535. *Mr. Parkes.*] Did you not swear that the lining went on with the excavation and packing simultaneously? I said the packing went on with the lining.  
536. Does not the lining come on as you drive the face? No.  
537. Is it not the case that as you drive each length the packing and lining have to follow? No. How can you carry on blasting in a tunnel and follow on with the packing and lining at the same time?  
538. Does not the specification provide for the work to go on in that way? It provides for the work to go on as I direct it to be done.  
539. For how many months was this work under your hands? From the date at which it commenced—that is, from June, 1894, until the 1st April, 1895.  
540. Therefore it was nine months in your charge? Yes.  
541. Then why should you try to put the responsibility on to another officer? I am not trying to do that. I was asked whether I knew anything about the defective work upon Contracts 79 and 79A, and I said that in regard to 79A I was given to understand, subject to correction, that the alleged defective work was not done when I was in charge.  
542. Having regard to the time you had the contract in hand, and the position of this defective work, are you still prepared to swear that it was done when the work was out of your hands? I have not sworn at all yet in regard to the date which the work was done, but I am given to understand that it was done after 1st April, 1895.  
543. As a matter of fact, must not the work have been done while the contract was under your charge? Certainly not.  
544. *His Honor.*] At what stage of the carrying out of the contract is the lining put in;—is the excavation generally finished to a large extent before the lining is begun? To a large extent.  
545. When was the lining begun in the case of this particular contract? I cannot say.

George Dawson recalled and further examined:—

- G. Dawson.  
29 May, 1896.
546. *Mr. Parkes.*] In constructing these sewers, do they not follow up the excavation with the lining? After a time; not close up.  
547. How far behind would the lining be? It depends upon the contract.  
548. In the case of Contract 79A, how long afterwards would it be? Some considerable time.  
549. How far was the excavation on before the lining was commenced? All the drives were through before we went on.  
550. Was it followed up with the lining at once? Some time afterwards; I could not say how long.  
551. At what date was the lining commenced, speaking roughly? I could not state the date at all.  
552. Was Mr. Davis the supervising engineer at the time? No, Mr. Griffiths.  
553. Whom would he be under? I do not know.  
554. *His Honor.*] Don't you remember when you left that job? Yes; some time at the latter end of January or the beginning of February in this year.  
555. How long before that was it that you were working in the place which was examined yesterday? It was in December, 1895, that that was done.  
556. What was the last work of all you did upon Contract 79A? It was in No. 14 shaft.  
557. Were you working there upstream in the brickwork? We were building the shaft there—the manholes.  
558. The lining of the section between shaft No. 12 and shaft No. 13 had been finished then? Yes.  
559. Was the work finished between 13 and 14? Yes; all the brickwork was finished, but the plastering was not finished.  
560. You were doing work near the surface? Yes.  
561. How was it that you remembered the distance from the shaft No. 13 to the bad work which was examined yesterday? The distance is marked every 35 feet on the concrete.  
562. Where is it marked? On the spring. There is a peg every 35 feet. The inspector marks it with red carbon on the concrete.  
563. Which way were you working with the brickwork? We were working up stream towards shaft No. 13.  
564. Which way were you measuring? The measurement started from shaft No. 13 down stream.  
565. Then you were measuring backwards as you went up? Yes.  
566. Did you make any note of the distance from the shaft to the bad work which you spoke of the other day;—I want to know how it was that you bore it in mind? Because it was such a big cavity. When you are running along with a truck in low places you take notice of them on account of knocking your back,

back, and when you come to the big places where you are able to straighten yourself you notice those also. In this particular case you could scarcely forget the big cavity, because you would be watching for it as you went along. We had at times to come a long distance underground where the rock was close, and I was very glad sometimes to get a chance of standing up.

G. Dawson.  
29 May, 1896.

567. What impressed this particular cavity upon your mind was the circumstance that it was a very high place? Yes, and at 275 feet there was a piece of timber. The ground was not too good there, and they put a piece of timber in. That would be 275 feet from No. 13 shaft.

568. Was the measurement done before the lining was put in? Yes; it is marked on the concrete for the pegs to go in just where the brickwork starts—that is, on the spring of the concrete.

569. And that is how you remembered the position of this very place? Yes.

570. There were other high places which were filled? There were none nearly so high as that.

571. Was this the only very high place? It was the only very high place. They got out of their levels somehow; they got too high.

572. And you had occasion to notice it from its extreme height? Yes.

573. And noticing its extreme height, you remembered exactly where it was? Yes; and, as I have said, I always stopped there to straighten my back.

574. Was this the only cavity which was left quite empty? There were other places left, but I could not locate them to a brick or two. Whenever we had the inspectors out of the way we could leave a drum or two.

575. You workmen did that of yourselves? Yes.

576. Where was your "boss" then? I reckoned that the bricklayer was my "boss."

577. How many men would be there at that time? The bricklayer and myself.

578. Did no one else actually see these hollow spaces? No one except the inspector. He would see them as he went through, but not of course as we were passing them by.

579. The inspector would not be there when you passed them? No; because if he had been there we could not have done it.

580. If the inspector had been there these places would not have been left? No.

581. No inspector on behalf of the Government and no inspector on behalf of the contractors was there, you say, to see that the work was properly done? No one but the bricklayer and myself.

582. Who is immediately over yourself and the bricklayer? The manager, Mr. Reid.

583. Did he ever go down? Very rarely.

584. He seldom went underground? I have not seen him underground more than twice.

585. When he did go down would he be able to see any bad work? He could do so if he wished.

586. How could he see the bad work if it had been covered up by your getting ahead of it? He would know by the pace at which we had got through. Besides he would know that we were not using the stuff. He had taken the sections for the metal, and he often used to laugh about it, and would say that we should have to give the stuff away to the Council, and that we were using none at all. He would chaff us for not using it, and give us a drink on the strength of it.

587. Where did he take you for the drinks? Sometimes to the Queen's and sometimes to Cabel's.

588. What length did this manager look after? He looked after the whole of 79A.

589. Were any of the contractors ever there? No, the contractors never came near us.

590. The manager treated it as a joke that you should use so little metal for the concrete? Yes; he often chaffed us about it, saying how well we were getting along with it. Then the quantity of cement was always given to the Government inspector according to the quantity of sand we used. The quantity of cement given to the inspector was always larger than we actually used.

591. And you used more sand than should have been used? Yes.

592. Did you use sand alone? No; we used a little cement.

593. And I understand that you left some places quite empty? Yes.

594. And other places filled with bad concrete? I should not like to say it was bad. I did not make it.

595. But the concrete contained more sand than anything else you think? It was supposed to.

596. At any rate the proportion of cement to sand was not used? The only time I used the cement was when we were building the shafts. That was the only time I had to do with the gauging of it.

597. Who gauged it for the concrete supposed to be used in the drives? The men engaged on the top.

598. They sent it down mixed? Yes.

599. Dry mixed or wet mixed? It was always damp a little.

600. You had to damp it further below? No; it was just ready for us.

601. *Mr. Parkes.*] Did you ever work under Inspector Wagg? Occasionally; never very much.

602. Did he ever complain of bad work being done? Not to me. The only time he ever spoke to me was about a gauge-box.

603. How long did you work under Inspector Wagg? I do not suppose more than a week altogether.

604. Did you ever work under Inspector Harris? Not directly. He was over the plasterers.

605. Did he ever complain about the work? He had one piece altered. He reckoned that it was not up to the mark. It was done over again, but I never saw the work.

606. Were you upon Carter, Gummow, & Co.'s contract when Inspector Harris was removed? Yes; I think he went to take charge of a job.

607. Was he removed for quarrelling with the men, or for any reason of that sort? Not that I know of.

608. *Mr. Hickson.*] What is the name of the bricklayer who worked with you? Crawshaw.

609. Did he know of you leaving these cavities unfilled;—was it with his connivance that it was done? Yes.

610. The two of you together connived to do the defective work? Yes.

William Henry sworn and examined:—

611. *Mr. Parkes.*] What is your occupation? I am a carter.

612. Employed by whom? W. Burcombe.

613. Does he draw sand for the firm of Carter, Gummow, & Co.? He drew a few loads some months ago, but he has not done any recently.

614. You have drawn sandstone for Carter, Gummow, & Co.'s contract;—I mean the Johnstone's Creek aqueduct? Yes.

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- W. Henry. 615. Will you tell His Honor the quality of the sandstone you drew? We drew a good deal of the ballast from Ryan's quarry at Pymont, and we also drew some from Meredith's quarry at Annandale.
- 29 May, 1896. 616. You drew some from another quarry, did you not? No; only from those two quarries. I know of another man who drew from two other quarries.
617. Ryan's stone is what is called lower block—the best hard sandstone, is it not? A great quantity is.
618. How much of Ryan's stone did you draw? I could not say.
619. You commenced by drawing Ryan's stone? Yes; I think we drew it for a couple of months, but I could not swear to the time.
620. Ryan's stone was approved by the inspector? As far as I know.
621. It was good stone? Yes.
622. How much did you draw? I am not prepared to say.
623. Did you draw nearly as much from Ryan's quarry as from Meredith's? I believe we did, speaking roughly.
624. About half and half? Yes.
625. What was Meredith's stone like? Fairly good stone. As far as the testing of stone is concerned, I do not know whether it was passed stone or not.
626. Comparing it with Ryan's stone, was it not defective? I am not prepared to say whether it was defective or not. Ryan's stone was the better of the two.
627. Would Meredith's stone stand a test of 6,500 lb. to the square inch? I could not say.
628. *His Honor.*] Do you know anything whatever about the testing of stone? No; that is a thing I cannot speak of.
629. *Mr. Parkes.*] Was the stone top block stone? It was mixed stone—some was top block and some was bottom block. It was a very different face of stone to Ryan's.
630. Is it half as good in quality as Ryan's stone? Some of it may be as good, as far as that goes, and some of it would be inferior.
631. How much inferior stone did you draw? It was mixed.
632. But you did draw a quantity of top surface stone? Yes.
633. Do you know anything about the making of concrete? Very little, further than seeing it mixed. I never worked on a concrete board.
634. Do you think some of Meredith's top surface stone would make good concrete? Some of it would be very bad stuff for concrete, I should say.
635. Did you draw a thousand loads of this soft stuff? Nothing like a thousand loads.
636. Where is Meredith's quarry situated? On the other side of Johnstone-street, in Annandale—quite close to the sewer.
637. You drew some sand did you not? A few loads only.
638. Where did you draw the sand from? From Balmain.
639. Had it loam mixed with it? No; all that I drew from there was good sand.
640. Was this soft sandstone which you drew crushed for sand? Some loads went out from the same quarry when the job first started.
641. *His Honor.*] For crushing? Yes; at the start of the job I drew three or four double loads out of the quarry for crushing.
642. *Mr. Parkes.*] Where was the stone crushed? At the crusher at Annandale.
643. Did you think the sand as good as the clean washed sand? Yes; it stood the Government test.
644. *His Honor.*] Are you speaking of the sand which you drew as sand? No; of the stone.
645. *Mr. Parkes.*] Do you know a man named Flood? Yes.
646. Did he draw for Carter, Gummow, and Co.? Yes.
647. Where did he draw from? From Ferris's quarry in Booth-street.
648. Was that top surface stone? I cannot say. I never drew any stone from that quarry.
649. Is the stone as good as Ryan's stone? No.
650. Is it one-half as good? It may be.
651. Why did you draw in the first place from Ryan's quarry? I do not know anything further about it except that the instructions we got were to draw from the quarry.
652. From whom? Mr. M'Millan employed my employer.
653. Who is he? He had the contract to draw the stone for Carter and Gummow's job. It was the first place we started to draw from.
654. You know Ryan? Yes.
655. Did you ever have any conversation with him? Nothing beyond speaking to him when we went to that quarry to get the stone.
656. The stone you drew in the first place from Ryan's you believed to be proved stone? Yes; as far as I know it was proved stone.
657. Who told you so? It was passed by the inspector upon the job.
658. Was the stone from Meredith's quarry passed by the inspector? The stone was used; I cannot say anything further than that.
659. You cannot say whether it was specially tested? I cannot say; that is outside of our work.
660. You have considerable knowledge of the nature of stone? A fair knowledge.
661. How long have you been working among stone? About five or six years, off and on.
662. If you were having concrete made, would you sanction the use of such stuff as you brought on to this job? Some of it was not fit for concrete work; it was more fit for making sand than concrete.
663. Still, you know it went into concrete? The balance that was left after the stone was crushed was used for concrete.
664. *His Honor.*] The crushing makes some ballast and some sand? Yes; as it leaves the crusher it is sifted by a screen.
665. *Mr. Parkes.*] What is the gauge of the screen? I could not say; it is a revolving screen.
666. What are the openings? There are only sufficient openings for the sand to go through.
667. Is it a fine mesh? Yes.
668. Would it be a  $\frac{1}{4}$ -inch? Less than that.
669. Cannot you tell us roughly how many loads of inferior stone you drew for the whole job? I could not tell you that now.
670. It would not be a thousand loads? No.
671. Did any other carters draw beside yourself? M'Millan drew quantities of ballast. 672.

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672. Did he draw inferior stone also? Yes, as far as I know.  
 673. To any extent? I am not prepared to say what quantity.  
 674. For how many weeks was he drawing? I could not say.  
 675. Is he still drawing? Not that I know of.  
 676. Where is the stone coming from that is now going into the work? I could not say. We do not go on to the work at all now.  
 677. How many other men beside yourself were drawing for the job? M'Millan, Flood, and M'Gill were drawing.  
 678. *Mr. Hickson.*] You were simply a carter carting stone on to the work? Yes.  
 679. You really did not know what became of stone or how it was used? It was crushed.  
 680. You know that it was crushed? Yes.  
 681. You told Mr. Parkes that some of the stone was good and that some of it was not so good? Yes.  
 682. And the softer stuff if crushed would be good sand? Yes.  
 683. *Mr. Parkes.*] All the stone that you drew was not crushed. You drew stone to make concrete? Yes; but it was crushed to make concrete.  
 684. *Mr. Hickson.*] You did not see it made into concrete? I did not see it mixed.  
 685. *Mr. Parkes.*] But I suppose that if drawn to the job it would be for concrete? Well, it was loaded in trucks under the crusher and run away to the concrete board; that is all I know.  
 686. You saw the trucks loaded with it to go to the concrete board? Yes.  
 687. Had those trucks the soft stone in them? It was all mixed as it went through the crusher.  
 688. *Mr. Hickson.*] The soft stone was used in the shape of sand, you say, and it would be good sand for the work? Yes; what went into sand in the crusher was used for sand on the works.  
 689. *His Honor.*] What came through in the form of ballast was broken to what gauge? Two and a half inch.  
 690. And that went round in trucks to the concrete board? Yes.  
 691. You carried the stone in the form of spalls? Yes.  
 692. *Mr. Gummow.*] How do you know for what purpose the sandstone was used after it was taken away in the trucks? I suppose it was used on the work.  
 693. Upon what work? In the open sewer at Lillybridge.  
 694. What is the sewer for? It is a stormwater sewer.  
 695. You do not know the number of the contract? No; I am speaking of the Lillybridge job.  
 696. *His Honor.*] Is that the storm-water channel at the bed of the creek—the substitute for the creek? Yes.  
 697. *Mr. Parkes.*] Did you draw to the contract which has the aqueduct in it? Yes.  
 698. Do you know the price of Ryan's stone? About 3s. a yard.  
 699. Do you know the price of the stone which you brought from Meredith's quarry? 2s. 6d.  
 700. Was that for the best class of stone? It was for the stone as a whole; no distinction was made in the price; I have given you the contractors' prices.  
 701. When you drew from Ryan's quarry you did not draw any top surface stone? I do not say that it was all bottom block.  
 702. *Mr. Gummow.*] How do you come to know the price of stone at Ryan's quarry? I used to make out the accounts for it.

Robert Rowan Purdon Hickson, recalled and further examined:—

703. *Mr. Parkes.*] If you look at the specification you will see the following clause:—

15. All sandstone used in the construction of these works, to be hard, sound, and solid, of the best description, free from all defects, and as per sample to be seen in the Engineer's office, and to stand a crushing strain of 6,500 lb. per square inch. A tensile test will also be required; for this six stones must be prepared 4 in. by 4 in. by 12 in.; these when laid on their natural beds upon supports 10 inches apart, must give an average breaking of not less than 4,333 lb., the strain being applied across the centre of the stone.

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Was that test applied to stone from these quarries? I could not say; I had nothing to do with this contract at all; none of it was carried out under me. (*Vide Appendix No. 1.*)

704. Did you not start this contract? No.  
 705. Did you not sign the agreement? No.  
 706. Did you not transact the business until the signing of the agreement? No, I gave up charge on 1st April, and the agreement was signed, I think, on 16th May.  
 707. When sandstone of the very best description, to stand a certain strain, is specified, would it be proper to substitute inferior stone for it? Certainly not.  
 708. In all the contracts with which you have had to do, nothing but the very best lower-block Pymont stone has been used? We have used stone from various places.  
 709. Sandstone which would stand 6,500 lb. to the square inch would necessarily be the highest class of stone? Yes. Pymont stand higher than that.  
 710. *His Honor.*] The crushing strain would be all that would be applied to stone used for concrete,—the tensile strain would be immaterial? Yes.  
 711. *Mr. Parkes.*] When sandstone is specified for the making of concrete, would it be proper to use brick-spalls instead of sandstone? I think brick-spalls are as good as sandstone.  
 712. Is not the porosity of brick greater than that of stone? Yes; but the porosity of concrete is not good in any case.  
 713. But for the packing of sewers would it be proper to use brick-spalls instead of sandstone, if sandstone were specified? I think they would be quite as good. I think hard-burnt bricks would stand a better crushing than sandstone.  
 714. Supposing they were bricks from an old building that had been pulled down? If they were bad bricks of course they would not do.

MONDAY,

MONDAY, 1 JUNE, 1896.

Cecil West Darley, sworn and examined:—

- C. W. Darley. 715. *Mr. Parkes.*] You are Engineer-in-Chief for Public Works? Yes.  
 1 June, 1896. 716. During the past five years you have made many changes in your official position, have you not? Two changes.  
 717. Will you tell us what they were? I was Engineer-in-Chief for Harbours and Rivers.  
 718. On what date was that? Up to the end of June, 1895. I went away for a holiday in April. I was away for two months, and when I came back I took the position of President of the Metropolitan Water and Sewerage Board and Engineer-in-Chief for Metropolitan Sewerage Construction. That would be at the end of June, 1895.  
 719. When changes are made from one office to another in that manner it is very difficult to obtain a proper comprehension of the works which come under you, is it not? It takes a little time to grasp all the works of course.  
 720. If you did not grasp the works you would consult Mr. Hickson? I always did. I made a practice of doing so in connection with any work which he had been carrying on so as to avoid change as much as possible.  
 721. When you took over the Sewerage Department you had often occasion to see Mr. Hickson? Mr. Hickson or Mr. Davis, who had been previously the supervising engineer.  
 722. Did you ever find, in connection with any of those contracts, plans or schedules coming to you with any irregularities? I cannot say I did. What do you mean by irregularities?  
 723. Were there any items, for instance, in the schedule concerning which you had to obtain an explanation from Mr. Hickson or Mr. Davis? I cannot call to mind anything that I had to get explained.  
 724. Did you not find in one of the schedules iron marked at £8 a cwt. instead of £8 a ton? Not I think in one of Mr. Hickson's contracts. I found quite lately a misprint of that kind in connection with one of our own contracts, but that had nothing to do with Mr. Hickson.  
 725. Did it not come to you in a schedule which had been prepared by Mr. Hickson's officer? It is possible that the paper to which you now refer was prepared not by Mr. Hickson as Engineer for Sewerage, but by Mr. Hickson as Engineer for Public Works. I think the matter was in the printer's hands at about the time the change was made. I think it was printed just about the time Mr. Hickson gave up charge, and took over the duties of Under Secretary. I am referring to an error which was found in a contract quite recently, which came to me as Engineer-in-Chief for Public Works.  
 726. But the papers came from Mr. Hickson, did they not? The mistake was made just about the time of the transfer. I do not suppose Mr. Hickson ever saw the contract.  
 727. What contract was it? The contract for a little sewer at Annandale, from Park Road, I think, to Long Cove Creek. (*Vide Appendix No. 2.*)  
 728. Who were the contractors? The firm whose tender was accepted was Carter, Gummow, & Co.  
 729. They were the parties who were paid at the rate named? No payments were made at that rate. The tender was only just accepted when the mistake was found out.  
 730. But the Government were liable to pay at that until you made a compromise? The Government would have been liable if the error had not been detected.  
 731. How did you remedy it? It was brought under my notice when the specification was sent to my field officer. He was going through the plans when he detected it, and brought it under my notice. I sent for the contractors, and they agreed to alter the word, as being a palpable misprint.  
 732. You took steps at once to save the country? Yes.  
 733. You had to make a compromise? There was no compromise. The contractors came forward like men, and acknowledged that there had been a palpable mistake.  
 734. And now they will be paid at the rate of £8 per ton? Yes.  
 735. Did they get no concession for the alteration? None whatever.  
 736. When did you take over contract 79A? That was one of the contracts which came over to me when I took up the duties at the end of June, 1895?  
 737. How far on was the contract? I could not say, speaking from memory.  
 738. Was any of the lining done? I think they were doing some of the lining, but I could not say at this moment.  
 739. Could your supervising engineer say? Yes; he would be able to speak as to that.  
 740. Who would he be? Mr. T. Griffiths.  
 741. You do not know at what stage the work was so far as the lining of the tunnel was concerned? I know that a great deal of the lining was done during my time, but I do not know whether it had then been actually started or not.  
 742. It is unsatisfactory to you to have to take over a work which is only partially completed? It is not unsatisfactory exactly, but it is more difficult for anyone to take up a work in that way than to start one.  
 743. It would have been infinitely better if this work once started had been completed under Mr. Hickson, would it not? No doubt it would.  
 744. It disorganises matters to make a change? Any change must bring about a certain amount of disorganisation.  
 745. If you have works in hand which you have commenced it is much better for purposes of control that you should complete them? Quite so. There are certain things which an engineer may have it in his mind to do and when the proper time comes it is sometimes very difficult to convey those things to another person. You may quite unintentionally and accidentally forget to convey your intention to your successor.  
 746. How far was Contract 69 completed when you took it over? It was finished.\*  
 747. Absolutely finished? I think so.  
 748. No work was done afterwards, you can swear to that? I think I may safely say so. There may have been some little detail, but I think I can safely say that the work was finished when I took over the contract. That is certainly my impression.  
 749. I see that a voucher was made out on the 4th July, 1895? If a voucher was made out on that date all the work contained in it must have been done some time before; all the measurements must have been checked and worked out.

750.

\* NOTE (*on revision*):—I understood Question 746 and several succeeding questions to refer to contract 79.—C. W. D.



750. At all events, after the 4th July you think no excavation or concrete work was done? I think not. I am under the impression that no work was done on Contract No. 69 after I took charge. It was looked upon as finished. C. W. Darley.  
1 June, 1896.

751. Did you examine the work yourself? I did not.

752. In all underground work it is necessary to have the weep caused by soakage from rain and the natural weep carried away by weep-drains or sub-ducts? It depends upon the nature of the ground. If it is clay or bad ground they are desirable.

753. It is the usual thing in sewer construction to put weeping-drains? In bad ground.

754. Would you not put them in rock? No.

755. Why? The object of the drain is to take away water from underneath the sewer.

756. Then why do you specify for them in rock? Sub-ducts are put in wherever they are required, that is, where the ground is bad.

757. The object is to take off the weeping, is it not? To take off the soakage to keep the ground dry during construction. I always consider it desirable to omit them if it can be safely done.

758. I see the excavation was increased from 9,300 cubic yards in the tunnel to 17,000 cubic yards. That is a great increase;—was it not on account of the nature of the ground? I did not see the ground; I cannot say. I was not in possession of the details of this particular contract.

759. From your knowledge of engineering you can say whether in ground of that nature sub-ducts should be used? I would not put a sub-duct in unless the ground were very wet.

760. But if you specified them as necessary in wet ground should they not be put in? I would not put them in if I thought I could do without them.

761. Would not the absence of sub-ducts be very detrimental to the packing round of the sewer if it were not of concrete? That depends upon the amount of weeping. Of course if the weep were very bad a sub-duct should be put in.

762. You yourself have never had reports sent in to you of defective work upon Contract 79? I never knew of any bad work there.

763. Supposing you had the opportunity of doing the work by blasting or by guttering and gadding, the two things being at about the same price, would it not be to the interest of the entire work to have it done by manual labour? If the prices were the same.

764. Instead of shattering the surroundings of the tunnel with powder? Yes; if the prices were about the same I should prefer the manual labour, but it would be more tedious and much slower work.

765. Not slower work in the long run, I suppose, because you could at once follow it up with your sewer lining and packing as you went along with your excavation, whereas if you use powder you would have to wait for a considerable time before you followed up with the lining? You cannot have an excavation and lining going on at the same place.

766. But could not the lining follow very shortly? It would depend upon the shafts.

767. You do not work from one shaft only? We work with two headings from one shaft until the excavations meet.

768. How far are your shafts apart? The distances vary.

769. What would they average? From 300 up to 800 feet.

770. You could follow up at least 300 feet behind, could you not? The two shafts must be connected.

771. If you were blasting you could not follow up so closely with the lining, I take it, because the concussion of the explosion would prevent your doing so? Whether you are blasting or doing the work by hand the two shafts must be connected before you proceed with your lining.

772. *His Honor.*] You have to take out the spoil through the opening? Yes.

773. And when you meet another shaft the excavation is finished? Yes; we drive from one shaft to another, and when the two shafts are connected, of course the other work can be proceeded with.

774. You drive in two faces? Yes.

775. Until you get one tunnel through between two shafts? Yes.

776. You can then begin the lining in one, while the driving in the other direction is going on? Yes.

777. There would be two drives going on in opposite directions? Yes.

778. *Mr. Parkes.*] What you have just described would not be practicable with blasting? Yes; because the blasting would be so far away.

779. You do not know whether in Contract 79A the lining followed immediately? I could not say. I was not down on that contract. The resident engineer would be able to give you the information.

780. How far was Contract 77 advanced when you took it over in June? Very little was done when I first visited it. Some of the foundations to some of the piers only were being put in. The work was really taken over by Mr. Smail, acting on my behalf. It was taken over at the time of the change in April. There was an officer acting for me while I was away on my holiday. I went away at the end of April, and Mr. Smail acted as Engineer-in-Chief for Sewerage Construction. I should prefer to say that the whole of this work was done during my time of office, although for the first two months it was supervised by an officer acting for me. The contract was let about the time Mr. Hickson was giving up charge.

781. You really did not enter upon your duties until September? Yes; on the 1st July.

782. And it would take you a considerable time to gather up a knowledge of the work? Some time.

783. During the time you were away on your holidays the supervision of this work was actually under the Engineer-in-Chief, Mr. Hickson? No; it was, more properly speaking, under Mr. Smail.

784. He would be under the Engineer-in-Chief? No; he was really acting for me. He was duly gazetted as Acting Engineer-in-Chief for Sewerage Construction, and he would have the same powers which I have.

785. Take the case of a sewer 3 ft. 3 in. x 2 ft. 2 in., with a fall of 1 in 2,000, and 2 miles long, what would be the pressure per inch of the head at the distance of 2 miles from the entrance, supposing the sewer to be charged to the utmost with storm-water? Of course, if you were to actually block the sewer, it would not be running.

786. But supposing it were charged by very heavy flood-water, and that it had become compact with water, what would be the pressure? It would be under 2½ lb., but I cannot imagine such a thing happening, because all these sewers have by-washes.

787. I was speaking of Contract 79? There were several by-washes in that contract, so that what you say cannot apply to that.

- C. W. Darley. 788. But a tremendous surcharge might take place from heavy rain? Not in that sewer, because there would be overflow drains.
- 1 June, 1896. 789. Would they be sufficient to save it? Yes; they would let off all the water that could get into it.
790. Have you not a calculation of the pressure—a certain pressure which the sewer would have to stand? Yes; they are calculated to stand a certain pressure.
791. What head? A 3 ft. 3 in. sewer would flow when full 2 ft. 9 in. deep.
792. Taking 2½ lb. to an inch, that would be on a brick 27 in. in area 60 lb.? On one brick, yes.
793. Therefore they would need stout backing to support that pressure? Not when the bricks are set in cement.
794. But you construct your sewers with the bottom portion of concrete, and with a 4½ brick ring arch over it, and the reason that you pack it firmly I suppose is to keep it from fracture, or being entirely lifted from the pressure of water or gas? No water or gas pressure would lift it if the bricks were set in cement. You must take the strength of the whole periphery of brick, and you can calculate that at 200 lb. to the inch.
795. What is the object of packing over these sewers with concrete? The object is to keep any fall from coming down. If there are any cavities it is usual to fill them up. In many cases the filling might be omitted, but it is desirable to fill them up in order to prevent settlement from taking place, or a creep or crush from starting. The water would rarely if ever touch the roof of any tunnel, so that, practically, the work might be omitted.
796. Supposing the packing is not completed—that it is not made perfect, that vacancies are left, and that a creep of which you have just spoken occurred, the consequences would be very disastrous in the sandstone rock in which many of these sewers are built, would it not? Many of our large railway tunnels are built through sandstone rock without any lining, and there are, I think, 6 miles of tunnelling in the case of the Sydney Water Supply Works through sandstone rock without any lining. We look upon sandstone rock as being quite good enough, especially in the case of small tunnels such as you are speaking of.
797. Are not the tunnels in the case of the Sydney Water Supply Works lined? Not in the sandstone rock.
798. Not in the fine compressed sandstone perhaps? In none of the sandstone tunnels.
799. Are they not lined at Judge's Hills? Yes; they are lined there because they are in shale. The shale disintegrates when the air gets to it; therefore you want to avoid the air getting in.
800. *His Honor.*] You mean by oxidization? Yes.
801. The shale generally turns into a white clay, and then into a red clay, does it not? Some of it would go into clay—in fact, it is ground up, and bricks are made of it. In some cases where the shale has been lying fully exposed to oxidization it obtains the consistency of fine gravel, and it has been used, as in the Camden district, for putting on to roads.
802. The main point is that you consider that the packing of the lining of our tunnels more important for the purpose of saving any settlement than for the purpose of strengthening the lining itself to enable it to withstand pressure from within? Quite so.
803. You do not consider the packing necessary to enable it to resist the pressure from within? No engineer would calculate upon the roof lining of an arch to strengthen his arch against any pressure of that kind. So far as the strength of the sewer is concerned, the packing of the lining might be altogether omitted.
804. *Mr. Parkes.*] If you were packing over a sewer in shale, would you not pack with concrete? No; with the shale itself.
805. *Mr. Hickson.*] In order to clear up the question of who took charge of the work from 1st April, when I gave up charge, until you came back from your holiday, will you look at the *Gazette* notice I now hand you;—the *Gazette* is under date 23rd April, and the number is 273;—you will see that Mr. Smail is there gazetted Acting Engineer-in-Chief for Metropolitan Sewerage Construction during the absence of yourself? Yes; that is so.
806. As a matter of fact, I had nothing to say to the sewerage works in any way after the 2nd April, 1895? That would be so.
807. In regard to these sub-ducts;—for what purpose are they put into the tunnels? To take away any water during construction.
808. And you say that you would, wherever possible, avoid putting in sub-ducts? Certainly I would, if the tunnel could be constructed without them.
809. If anything they are a source of weakness to the foundation of a tunnel? I look upon any pipes laid under the invert of a tunnel as objectionable if they can be avoided. I would rather have solid ground there.
810. Would you ever think of putting them in if you were driving a tunnel through rock? Certainly not.
811. Not under any circumstances whatever? No.
812. *His Honor.*] Supposing you were driving through rock in which, from the existence of faults or bands, there was really a large quantity of weep, would you leave out the sub-ducts, or use them? If I thought the contractor could carry out the work and lead off the water without them, I would certainly omit them.
813. I understand, then, that the principal use of sub-ducts would be during the course of the construction of a work, and not after the sewer had been constructed? They are more wanted during the course of construction in bad ground, where you cannot get your lining in properly, unless you have means of taking off the water underneath.
814. Supposing there is weeping, and supposing you packed with some other material than concrete—supposing, for instance, that in shale you packed with the shale which comes out of the drive, is that packing any more likely to be affected by the continuation of the natural weep after the sewer is constructed than is the surrounding rock itself? No.
815. You do not want sub-ducts, then, to prevent the drives from being weakened or opened out above the crown of the sewer by the tendency of the weep to flow along the course of the excavation? No; the disintegration would be due not so much to water as to air.
816. Once you can get the packing in, whether it be shale or otherwise, the water oozing from the sides of the original unexcavated ground is not an element you need trouble yourself about? That is so.

817. *Mr. Gummow.*] As far as you have had experience, do you consider the works carried out by Carter, Gummow, & Co. have been satisfactory? I have never found their work otherwise. My experience of the firm is that they are always most willing to carry out the engineers' instructions. C.W. Darley.

818. *His Honor.*] With reference to the question of subducts, supposing they are laid under a sewer, they fall slightly each way, I understand, from the centre of the interval between the shafts towards each shaft? Yes. 1 June, 1896.

819. They have a pitch of their own, from the centre of the interval between the two shafts, distinct from the fall of the sewer itself? That is usual. It will depend upon circumstances. The distance apart between the shafts is, of course, an element in the case.

820. Sometimes you would have to make them fall all through with the grade of the sewer? Yes; but where it is practicable to give a fall both ways it is well to do so.

821. Supposing that subducts are constructed, and that they are left in, and that the whole work is completed, what becomes of the water which trickles down the subducts to the shafts;—is there any excavation to catch that water and hold it under the shaft;—is there a continuation downward of the shaft, or what provision is made? In the absence of pumping provision, it would be necessary to carry it out to the mouth of the tunnel, otherwise it would be sealed in. Where the tunnel is in bad ground it would have to be taken right through to the outlet.

822. If you grade the subducts down from the centre of the interval between the two shafts, then, in the absence of some such outlet when the work is completed, they must be worse than useless? Yes.

823. You do not of course put in any cross-excavations to act as an outlet from each shaft? No. My idea is that subducts should not be put in where they can possibly be avoided.

824. The subducts being graded down to each shaft from the centre of the interval there will be a certain accumulation of water there? Yes. The water would be sealed in. There would be no escape for it.

825. *Mr. Hickson.*] A workman was examined here the other day, who told us that he deliberately left out a piece of packing over the lining of the sewer in Contract 79A. I think he said he did it in December. That will, I think, be some time after the work was in your charge;—had you any knowledge of it;—was it reported to you in any way? No.

826. You have heard of it now for the first time? Yes.

827. You had a resident engineer and inspector on the spot, I presume? A supervising engineer, a resident engineer, and an inspector.

828. If a workman deliberately lays himself out to do a bad piece of work it will be utterly impossible for any resident engineer or inspector to detect it? Quite impossible. If any number of men make up their mind to do bad work they can do it. The inspector cannot be standing over every man. He has to watch several places which are working.

829. The only way in which you could meet such a case would be to put an inspector over every man? Yes.

830. Would you consider yourself personally responsible if a piece of bad work were found under such circumstances? I should not.

831. *Mr. Parkes.*] Are these subducts not permanently connected with the sewer;—do they not discharge into the sewer itself? I do not know what has been the practice of the Department in regard to any subducts which had been constructed in the past.

832. Cannot they be permanently connected with the sewer itself? They can be, but it is a very objectionable practice. You want to keep the sewer free from outside drainage.

833. If you were building temporary subducts, would you go to the trouble of putting in good earthenware pipes, well packed with spalls of rock? I would put them in in the best way possible. If anything happens to them it means injury to your sewer. If you put them in at all you must put them in in the very best manner.

834. Why would you put subducts in at the side of a sewer if not to take away drainage? In dealing with engineering matters you meet with very many difficulties. It is not wise to put subducts there.

835. Is it not necessary for the preservation of the sewer to keep the outward water connected with the inward flow in order to keep the surroundings of the sewer dry? No.

836. Supposing there is a great accumulation of water on the outside of the sewer;—what becomes of it? It must find its own exit.

837. What becomes of the lining? It will not hurt that.

838. Water is constantly accumulating under such circumstances, is it not? That may be; but it will not hurt cement and bricks.

839. But will it not hurt shale packing or any other soft lining? Not to any serious extent.

840. *Mr. Hickson.*] Should such a thing as the connection of outside with inside water for one moment be permitted? No.

841. The object of the sewer is to take away all the sewerage from the upper district, and that must be prevented from mixing with the outside water? Certainly you must exclude the outside water as far as possible.

842. *His Honor.*] It would be practically impossible unless you adopted a very complicated mechanism to let the outside water into the sewer without letting the inside water out? Exactly; the sewerage would escape. With regard to the water injuring the shale, for instance, outside the sewer, it must be remembered that the water is always present there. Water cannot be said to injure the ground in which it is found lying. It is lying there at all times, and it will be no worse than before. Water may lie in the shale down below without, so far as we know, injuring it at all; but everything possible must be done to keep the outside water from the sewer. If you let in the outside water you let out the sewerage.

843. *Mr. Parkes.*] If, as you say it is necessary for everything possible to be done to keep the outside water from getting inside the sewer, does not that make it necessary to put round the sewer a good packing of concrete? Not if you get a good tight lining and rendering.

844. *His Honor.*] With reference to the action of cement on the bricks, I understand a portion of your evidence to mean this—that cement properly used in brickwork of this kind is as strong as the bricks themselves? Yes.

845. And that practically a sewer built in this way is a barrel of material as strong as is the material of which the baked bricks are made? Yes.

846. That is to say, it is as good as if it had all been baked in one piece? Yes. If a properly-constructed sewer were broken up you would be more likely to break through the bricks than through the joints.

- C. W. Darley. 847. *Mr. Parkes.*] There is always more or less porosity in bricks? Bricks are specially selected, with the minimum amount of porosity. Hard burnt bricks which are specially used in sewerage works have a very small amount of porosity.  
 1 June, 1896. 848. *His Honor.*] In sewerage construction you engineers have given up the use of concrete filling, is not that so? Over the lining, yes.  
 849. It used to be always adopted? Yes.  
 850. In every kind of construction? Yes; although I was always under the impression that it was a wasteful use of concrete.  
 851. I understand that now in the interests of economy the practice has been given up? Yes.

George M'Creddie, sworn and examined:—

- G. M'Creddie. 852. *Mr. Parkes.*] What is your occupation? I am an architect and consulting engineer.  
 1 June, 1896. 853. You have had considerable experience in your profession? I have had sixteen years' practice in Sydney in all classes of work.  
 854. Have you ever done any sewerage work? Yes; we have carried out a good deal of work of that kind.  
 855. In what particular places? Well, we have undertaken a large job in Brisbane.  
 856. In all your works of that kind you have been very careful in your calculations before constructing? Yes.  
 857. Can you tell His Honor the nature of the work you have carried out in Brisbane? It is some time ago since we completed the work, but as far as I can recollect some 3 or 4 miles of sewerage in one section were completed, and some 7 or 8 miles in another section. The sewer was intended to carry away sewerage and storm-water.  
 858. What class of work was it? This particular sewer was built of 9-inch brickwork and cement.  
 859. Why 9-inch? We estimated that that was required to give the necessary strength to the sewer.  
 860. Would not 4½ inches have suited your purpose? No.  
 861. How did you come to that conclusion? From calculations we took out as to the strength of the sewer we were to put down.  
 862. After you had put in the lining with what did you pack the top of the sewer? With hand-packed ballast.  
 863. What sort of ballast? Small ballast.  
 864. What was the reason of your packing with this ballast? On account of the pressure inside.  
 865. *His Honor.*] You mean to resist the thrust outwards? Yes.  
 866. *Mr. Parkes.*] To prevent the sewer from lifting? Yes.  
 867. And to resist the pressure from the storm-water? Yes.  
 868. Did you put any weeping drains to that sewer? I could not say, speaking from memory, whether we did so or not. The sections are in the Brisbane office.  
 869. Weeping drains are necessary, are they not? We generally put them in.  
 870. How do you get away the water from these weeping drains? We always consider that it is to our benefit to have a drain while we are carrying on the work to take away the water.  
 871. But do you make an outlet for the pipes anywhere? We carry them underneath the bed of the sewer, and drain them to any place where we can get the water away.  
 872. Would the drains do any harm if they were connected with the sewer itself, so long as they were built on the sides? No; they would make no difference.  
 873. There is always more or less weep in an excavation of this sort? Yes.  
 874. Does that weep injure the sewer if it is not provided for? It does not do it any good.  
 875. Does it injure the packing round the sewer if it is unprovided for? I should say it would.  
 876. Could you give us the pressure there would be in an ordinary sewer, about 2 miles in length, supposing it were charged in time of heavy flood;—we will suppose that provision were made to take off a certain quantity of water to ease the sewer, suppose the sewer were 3 ft. x 2 ft., and that it was 1 in 2,000 fall? There would be about a 6-foot head, and that would be about 3 lb. to the square inch.  
 877. Not more than that? No; not more.  
 878. What is the pressure which will destroy a boiler, per square inch—a riveted boiler? That depends.  
 879. It would be a good boiler that would stand a pressure of 40 or 50 lb. to the inch? Yes; that would be a boiler made to stand a good pressure.  
 880. Do you think a 4¼-inch brick-lining in the sewer would be sufficient to stand a pressure of 3 lb. to the inch? I do not think so.  
 881. You think that would lift it? Yes.  
 882. In spite of the adhesive nature of the cement? Yes.  
 883. It would fracture it perhaps? Yes.  
 884. Therefore, you think it necessary that these sewers should be well packed on the top? Yes.  
 885. Is it not necessary that they should be packed with concrete or with stone-spalls? In the case of a 4½-inch lining I should certainly pack with concrete. The sewers are built according to the sewerage you have to take away. In the case of our 9-inch brickwork in Brisbane we found the hand-packing at the top of the lining sufficient. Had we been building 4½-inch work we should certainly have used concrete.  
 886. You went over to North Sydney last Thursday to examine the sewer there in which defective work was alleged? Yes.  
 887. You subjected it to a thorough examination? Yes; as far as I was able.  
 888. You found defective work? Yes.  
 889. Will you describe what you saw? I went down shaft No. 12, 95 feet deep. The sewer at the bottom was 3 ft. 3 in. x 2 ft. 2 in. It is an egg-shaped sewer. I had a hole knocked in the side of the crown 143 feet—2 chains 11 feet from the mouth. I found there on examination afterwards at the back of the brickwork solid concrete. I had another hole knocked in about 15 feet further on. This I examined and found at the back a space 7 ft. 6 in. long 3 feet wide and 1 foot deep.  
 890. You had a man accompanying you? Yes, two men.  
 891. Did they ask you to go further along the drive? They did. They wanted us to go further along, but I thought I had gone far enough.

892. You found the sewer a little too small? Well, the air down below was so bad that when I first got there I did not expect we should be able to get through at all, but we afterwards managed it. G. M'Credie.
893. But for that you would have gone further on? Yes. 1 June, 1896.
894. Do you think from what you saw that there is ground for the suspicion that the sewer was badly built throughout? From seeing the space which we found I should think there was need of thorough inspection.
895. Supposing that you as an engineer had discovered that error in packing, would you inspect the work throughout? Yes.
896. You think the work in Contract 79 and 79A ought to be thoroughly inspected? Yes.
897. An inspection could easily be made by a man going along in a trolley and tapping the bricks as he went along? Yes; the sound would tell him. Directly I heard the first sound the other day I knew there was solid work behind the bricks, but when I heard the second sound I knew that there was a hollow. You very soon get accustomed to it.
898. *His Honor.*] You could tell you think by the sound? Yes. Anyone who was accustomed to it could do so.
899. The reverberation in the tunnel itself would not prevent you from judging from the sound in the brickwork whether it was solid or not? No.
900. *Mr. Parkes.*] As you went down the tunnel the other day, did you notice any deposit or muck of any description hanging from the top of the sewer? On the edge of the shelf at the bottom there was a lot of stuff hanging. It looked as though it were soapy water.
901. Did you see any ooze in the sewer itself? The bottom was very wet.
902. Did you see any ooze coming through the brickwork? No.
903. Was there debris of any description oozing through from above? No. There was what appeared to me to be soapy water.
904. There was a deposit in it? Yes.
905. Had there been a weeping drain through the sewer, could that deposit have taken place? No; there would have been no deposit, nor would there have been any water running in the sewer.
906. Do you know if the contract is completed? I do not know.
907. In packing a sewer with shale, where it is damp, would it not be inadvisable to use a packing of Waianamatta shale? Yes; I should think the packing in that case ought to be of good solid material.
908. The shale is apt to be destroyed by the water? Well, decomposed.
909. If you, yourself, were running a sewer through shady ground you would pack it with concrete? I should prefer putting in concrete to any other material.
910. For what reason? The concrete forms an arch in itself at the back of the crown of the sewer.
911. You say distinctly that you are satisfied that an inspection should be made of the whole of the sewer? I certainly think so.
912. Supposing you had means of access, would you undertake to make the inspection? I should require to have the means of access. A small trolley is generally used in the case of small sewers of this kind.
913. Supposing you had the option of getting guttering and gadding work done at the same price as blasting, which would you adopt? Guttering and gadding.
914. Why? Because you could make the sewer exactly the size required, and you could build your work right up to it. It would make a better job altogether.
915. When you blast, you shatter all the surroundings more or less? You are likely to do it, and in many cases you do do it.
916. It is always a more defective job when you have to pack than when you have simply to build in a hand-cut opening? Yes.
917. Is it more expeditious to blast than to gutter and gad? In my experience there is very little difference. I myself prefer guttering and gadding, if it is possible to get it done at anything like a reasonable price. It is generally much dearer than the other process.
918. What is the reason you are able to follow up with the brickwork more quickly after the guttering and gadding than after the blasting? You can get on with the work more quickly from the fact that the whole has been cut to the exact size you want. You can build right up to it at once, whereas in the other case you have to pack.
919. You consider that in sewerage work, owing to the pressure from storm-water and the pressure from gas, guttering and gadding is preferable? The very best class of work must be done.
920. A second class of work will not answer the purpose? No.
921. It is not like work on the surface, where you can always keep a look-out for defects? No.
922. Once the work is done you have to take the defects with it—you cannot afterwards repair it? No.
923. Therefore you need to have the utmost supervision and the best class of work put in? Yes.
924. *Mr. Hickson.*] Was the Brisbane work you carried out a storm-water drain? For sewerage and storm-water combined.
925. You are aware that we do not in our Sydney system combine storm-water with sewerage? No; there are separate systems.
926. You know that our sewers are not for carrying storm-water, but are simply for carrying sewerage? Yes.
927. Therefore, if this North Shore sewer were full to its greatest capacity—that is, if it were flowing only two-thirds full—there would be no fear of the pressure lifting the roof off? Not if it was only two-thirds full.
928. Of course, if it were a storm-water sewer as well, you would have to make your roof very strong on account of the contingency of heavy floods? Yes.
929. *Mr. Gummow.*] Did you supervise the Brisbane job yourself to which you have referred? Only in passing through Brisbane. I have a partner there. All the plans were submitted to us for approval.
930. Do you know personally whether that job was thoroughly well done? Yes; I know that to be so.
931. You saw it all done? I did not see it all done.
932. Would you say there were no defects in the work? I could not say that.
933. Has the sewer any overflows? All the details are in the Brisbane office. Unless I looked them up I could not tell you.

- G. McCredie. 934. Are you in charge of the tunnelling which is being constructed in Pitt-street? Yes.
935. Have you any sub-ducts in that case? Yes.
- 1 June, 1896. 936. Near the railway station? Yes; some are near the railway station, and some are further down.
937. Where do you lead them to? We lead them, when we can, into the sewer. All of them go into the sewer.
938. Take a case where they are under the tunnel? We have only one case where the drain is under the line of tunnel. In that case there is a pit, and the water is pumped out.
939. When the job is finished? Yes.
940. When the job is finished you will keep that pit open? Yes. It will be so kept that the water can be pumped out of it at any time.
941. I understood you to say that if you had the choice between shooting and gadding out a drive you would prefer to gad it out? I said if the cost were the same I would gad it out.
942. What about the time;—how much do you consider you could gad out in a week in a tunnel for a sewer 3 ft. 3 in. by 2 ft. 2 in., as compared with blasting work—excavating to the extent of 4 feet by 3 feet? It depends upon the quality of the material, whether it be hard or soft.
943. Taking the ordinary hard sandstone 150 feet underground what would be the comparison between the two classes of work? The guttering and gadding would take longer.
944. How much, could you say? I could not.
945. How much could a man do in a week at gadding? I should have to think of that. It depends upon the material.
946. Supposing the material to be of equal quality in the two cases, and that it could be shot out or gadded out, what would be the comparison between the two classes of work in your estimation? I should think that finally the guttering and gadding would be found to take about as long a time as the blasting.
947. Did I not understand you to say that guttering and gadding would be quicker in the long run because you could do your brickwork more quickly in the gadded ground? Yes; I said I thought the brickwork could be done more quickly.
948. Would you go on with the brickwork while you were doing the gadding? I would follow on after. When a certain section was done I should start with the brickwork.
949. Would you wait until the tunnel had been driven between the two shafts, or would you let the gadding go on at the face and follow on at once with the brickwork? I should connect the two shafts and then follow on with the brickwork.
950. You would excavate from one shaft to the other first? Yes.
951. Before you made any start on the brickwork? Yes.
952. The excavations would have to meet before you did any finishing work? Yes.
953. What would be the difference in the time, say, in doing the brickwork in the cut-out ground as compared with the brickwork in the blasted ground? Well, if you gutter and gad you do not need to fill in at the top with concrete packing.
954. What loss of time is there in the filling? It takes some time.
955. While the man is filling, what is the bricklayer doing? He works along a certain section, and the packing can be proceeded with as soon as a certain quantity of brickwork is done.
956. Where is the delay in doing the brickwork then in blasted ground as compared with gadded ground;—where does the quicker work come in in gadded ground? There is no delay at all with gadded ground. The bricklayer will get along much quicker. He is not delayed by the labourer putting in packing.
957. Has not the bricklayer something else to do besides laying bricks? No.
958. Who does the pointing? That is done after all the brickwork is completed.
959. What is the general class of bricks you have in this telephone work;—are they as good as the sewerage bricks? I have not looked at the sewer bricks—that is, I did not carefully examine them. The bricks we are using in our tunnel are first class for the work we have in hand.
960. *His Honor.*] What are they? Wire-cut machine-made bricks.
961. Some bricks are single-pressed and others double-pressed? Yes; the double-pressed bricks are more expensive.
962. Are you using double or single pressed bricks? Single-pressed.
963. *Mr. Parkes.*] Are they using double-pressed bricks in the sewerage works? I did not examine them.
964. *Mr. Gummow.*] If you were buying a boiler for a client, would you consider that if the boiler stood a 40 lb. or 50 lb. pressure you would be buying a fairly good article? It would depend on the work the boiler had to do. I should consider it a fairly good article if it stood a 40 lb. or 50 lb. pressure.
965. If you were told that a boiler had been seen working at an 80 lb. pressure, would you consider it an extremely good boiler? It would depend upon the work.
966. If a boiler were working with over an 80 lb. pressure, would you consider it a good boiler? Yes; a good one.
967. An extremely good one? I should have to look at the class of workmanship in it.
968. Do you not know that you can buy an ordinary upright boiler which is guaranteed to stand 150 lb. pressure to the square inch—an ordinary trade boiler? Yes.
969. Do you consider that brickwork bedded in cement will stand 200 lb. to the square inch pressure? What thickness?
970. Four and a half inch? No; I do not think so.
971. *His Honor.*] What was the size of the storm-water sewer you were building in Brisbane? I could not say; I have not the particulars.
972. Would it be a much bigger piece of work than the 3 ft. by 2 ft. tunnels we have been speaking of? It would be about the same size as is the tunnel at North Shore.
973. No bigger? Not much, I think.
974. How many years ago is it since you did this work? Four or five.
975. The Queensland Government had more money then than they have now? Yes. The balance of the section was to be proceeded with as soon as they could obtain money.
976. Upon the same principle as regards strength? Yes.
977. In Brisbane there is an occasional rainfall of 12 inches to the hour? Yes.
- 978-9. *Mr. Parkes.*] You did not tell us to what price per foot your sewer in Brisbane would run? No; I could not tell you now. 980.

980. Could you get the information for us? Yes.

981. *His Honor.*] A subduct as a subduct is always below the invert of the sewer? Yes.

982. You cannot lead a subduct into a sewer then unless you run it an indefinite distance? No.

983. If the fall of the sewer were 1 in 2,000 you would have to run a long way? Yes; we do that in Pitt-street.

984. You say that it is not necessary to put in a weeping drain to intercept the water at a higher point than the invert of the sewer and to lead it down? It is done sometimes.

985. That is of no use to the contractor? No; but the bottom drain is of great use to him.

986. Only the true sub-duct will be of use to him; the other will be an extra piece of work for the benefit of the sewer itself? Yes.

987. The tunnel you are making is to be used for the telephone wires? Yes.

988. And it would not have to stand pressure from inside, although, as a matter of fact, it would do so? Exactly.

989. The great object is to keep it as dry as possible? We try to do so, although, so far as that is concerned, the wires are all insulated and the water will not damage them. There is no fear of damage to the wires because the same sort of wire is put under water and receives no harm from it.

990. There is a specification that you shall put in the weeping drain you speak of? Yes.

991. That is never specified with the sewer, is it? It depends.

992. Except in a swampy or wet piece of ground? Or where there is soakage through rock, when, of course, the drains will carry it away.

993. *Mr. Gummow.*] Who went down the tunnel with you last Thursday? The only two I know were Professor Warren and Mr. Davis. There were two workmen.

994. Was there anyone there representing the contractors? I do not know.

995. With regard to subducts, would it be possible to put a lining in a tunnel 7 ft. 6 in. in diameter with 30,000 gallons of water an hour running down it;—could that be made a good work? You might make an ordinary gutter and fill it up after the work was done, but I should think the best thing would be to have a proper drain.

996. Supposing a contractor were paid cost price for a subduct, and that he had the option of putting it in, would he, under such circumstances, do without the subduct? If I were the contractor I should certainly put in a subduct.

997. Do you think he could do the work to the satisfaction of those in charge without a subduct? I do not know that it is necessary for a contractor to put in a subduct as long as he can take the water off in some other way.

998. But he could do it? Yes.

Ernest Augustus Smith sworn and examined:—

999. *Mr. Parkes.*] You were, on July 29th, 1895, Crown Solicitor? I was Crown Solicitor from October, 1891, to April, 1894. E. A. Smith.

1000. You were Crown Solicitor then on 26th October, 1892? Yes. 1 June, 1896.

1001. During the time you were Crown Solicitor, were you asked to advise upon the damage being done to properties by blasting—that is as to the liability of the Crown? I have a vague notion that I did advise upon a question of that kind, but I should not like to speak definitely. (*Vide Appendix No. 3.*)

1002. Do you think you were asked to advise in regard to 100 claims? I could not say. I have a vague impression in my mind that among other things which came before me I had to advise upon this matter. No doubt if I could refer to any papers the whole thing would come back to me.

1003. Do you remember advising upon the claim of the two Schills against Carter, Gummow, & Co.? I may have done so.

1004. Will you look at the papers and tell me what advice you gave? I see that there were two questions submitted? The first was whether the contractor who carried out the work as specified as regards the size of the charges was liable. The question really was, who was liable for blasting operations, which caused damage—whether the contractors who carried out the work were liable, or whether an action would lie against the Department. The opinion was given to the Department of Public Works.

1005. *His Honor.*] What was the effect of the opinion? The opinion was that the contractors were clearly liable for any damage that would be done to any individual who was injured; but that the Government would be liable to any third person who was injured if it could be shown that the contractors were acting under the direction of a Government officer in doing the particular thing which caused the damage, but that, as between the Government and the contractors, there was a clause in the contract which would throw the whole of this damage on to the contractors, and that they would have to make good to the Government what the Government had to pay to a third person.

1006. *Mr. Parkes.*] Therefore, you are of opinion that if authority was given by the Department in writing for this blasting, the State would have to pay? Yes; if the particular act were done under the direction of an officer of the Government.

1007. Was that not through negligence in the drawing of the specification? No; because, as far as the contract had gone, as I pointed out, we had done all we could by fixing the contractors, as between the contractors and the Government, with a liability to make good all damage done to outsiders. The only thing was to take care that the engineer was careful in not giving a written order to do work if there were the slightest risk of doing injury to a third person.

1008. If guttering and gadding work had been done, these claims could not have come up? No; that is obvious.

1009. Do you think there ought not to be in the contract a condition, saving the Crown? I have no doubt there is; clause 19, I think, does that.

1010. You advised, then, that if authority were given in writing to do the blasting, the Crown was liable for the damage and loss? If the damage ensued on the particular act authorised.

1011. Do you know that hundreds of claims were made in respect of this damage? I was not aware of it.

1012. Supposing a building were injured to the extent of (say) £10,000, would the Crown still be liable? I take it that the extent of the damage would have nothing to do with the legal liability.

1013. There might be no limit to that? There might not be. It would depend upon whether the engineer authorised in writing the particular act which caused the damage. Under clause 14 of the conditions the whole thing was, I think, under the control of an officer of the Government.

Joseph



Joseph Davis sworn and examined :—

- J. Davis. 1014. *Mr. Parkes.*] What is your occupation? I am a member of the Institute of Civil Engineers.  
 1015. What is your position in the Government service? I am Principal Assistant Engineer for Metropolitan Sewerage Construction.  
 1 June, 1896. 1016. You have heard Mr. Smith's written opinion concerning the damage from blasting? I have heard Mr. Smith's evidence.  
 1017. Of course you read the original opinion? I did.  
 1018. In that original opinion you advise that a claim of £196 17s. 4d. should be refunded to the contractors for the Schills' damage? Looking at the papers, I should not regard that as a recommendation.  
 1019. Listen to this expression: "Under these circumstances I am inclined to think that the Department would be only acting in accordance with its usual custom in refunding £146 17s. 4d.; at the same time I desire to point out that so far as I am aware this is the only case in which a matter of this description has been dealt with through the contractors." Did not that mean a refund to Carter, Gummow, & Co.? It did not. My suggestion was not acted upon. The money was not refunded. (*Vide Appendix No. 4.*)  
 1020. Why did you advise that it be refunded? I have given my reasons pretty fully in the minute you have read. I might be permitted to explain that the late Crown Solicitor advised in a similar matter in connection with Contract 62—McSweeney's contract—and, as it seemed to me that Contract 62 was on all fours with McSweeney's, I acted on Mr. Smith's advice. I thought it applied to the point at issue, and inasmuch as the Department in the past had refunded or had compromised in the few cases—there had been very few—where damage had been done by blasting, and as this was the only case where the contractors were left to fight the matter out by themselves, it seemed to me only fair that they should be dealt with in the way I suggested.  
 1021. How many cases have you pending as regards Contracts 79 and 79A? None whatever, as far as I know.  
 1022. Are no claims being made? Not to my knowledge.  
 1023. As a matter of fact, do not the papers disclose a number of claims in respect of Contracts 79 and 79A? Of course persons make claims right and left without rhyme or reason.  
 1024. But are they settled yet? There is nothing to settle. As a matter of fact the Department had no liability.  
 1025. Have you not settled some minor claims of £10 or £12 or thereabouts in respect of Contract 79 or 79A? I do not remember any at this moment.  
 1026. Who prevented the claim of the two Schills being settled upon your recommendation? I do not admit that I made a recommendation. I do not know what became of the papers after they left me.  
 1027. What was the subsequent action? Reference to the papers will show that.  
 1028. There are no papers—the papers are apparently missing;—I suppose you cannot tell me where they are? I cannot.  
 1029. On 13th August, 1895, did you not recommend the payment of Arnold's claim for £10? I do not think it is at all likely. I was not in charge of the work at that time. (*Vide Appendix No. 5.*)  
 1030. Was not Arnold's claim paid at that time? I cannot call it to mind.  
 1031. Have none of the claims contained in these papers been settled? I have explained very fully the position of the Department, I think.  
 1032. How many claims have you settled? I should like you to be more specific.  
 1033. *His Honor.*] Do you remember any claims which have been settled? I do not.  
 1034. *Mr. Hickson.*] Claims are continually coming from all parts of the city in connection with sewerage works? Yes.  
 1035. I see from the papers a claim from Mr. Sam Smith, in connection with Contract 79, which was reported upon on 22nd June, 1893. I will ask you to tell His Honor what was done in that case? An inspection was made of the house in question, which was said to have been shaken by the concussion from the blasting. The conclusion arrived at was that the building had sustained no damage whatever. Claimant's solicitor was informed accordingly, and nothing more was heard of the matter.  
 1036. *His Honor.*] The Department has paid no claims? Not to my knowledge. Something may have been done after I gave up charge; but to April 1st or 2nd, 1895, I do not think any money was paid in respect of either Contract 79 or 79A.  
 1037. *Mr. Parkes.*] Would you swear that no payments were made? That is my impression.  
 1038. *Mr. Hickson.*] To the best of your belief, no payments were made up to the time you took charge? No.  
 1039. Has not the policy of the Department been to absolutely refuse any responsibility in regard to these claims? Most decidedly.  
 1040. And in all cases which came before me the reply I gave was that if any claims were made they must be made against the contractors? Yes; it was understood that we must endeavour to get the parties to claim from the contractors, but that if they persisted in claiming against us we must settle the claims, and settle the matter with the contractors afterwards.  
 1041. Has the Government ever had to pay any of these claims so far as you know;—had it done so up to the time you relinquished charge of the work? I do not remember any instance where the Government paid any money away for alleged damage by blasting.  
 1042. Do you know whether any of the contractors have had to pay any money? Yes; I know that Carter, Gummow, & Co. had to pay.  
 1043. Were the amounts refunded them? No.  
 1044. *Mr. Gummow.*] Has any action been brought against the Government in connection with our works? I do not think so.  
 1045. Have any been brought against Carter, Gummow, & Co.? Yes.

Christian Hansen sworn and examined :—

- C. Hansen. 1046. *Mr. Parkes.*] You worked under Carter, Gummow, & Co.? Yes.  
 1 June, 1896. 1047. On what contract? I do not know the number of it.  
 1048. Was it one of the North Shore contracts? Yes.  
 1049. How long did you work there? Off and on, about twelve months.  
 1050. While you were working there, did you see any defective work going on? I did not. 1051.

C. Hansen.  
1 June, 1896.

1051. All the work was good? So far as I know.  
 1052. Were you working along with Dawson? No—with Thomas Phillips.  
 1053. What work were you doing? Packing.  
 1054. What lengths were you working in? In Contract 79A, I think.  
 1055. *His Honor.*] Between which shafts? Between No. 13 and No. 12.  
 1056. That would be under Alfred-street? Yes.  
 1057. *Mr. Parkes.*] The work there was all well done? Yes; as well as I knew how to do it.  
 1058. Do you know anything of Dawson's work? No.  
 1059. Was Phillips your boss? Well, not the boss; he was the bricklayer.  
 1060. For what distance altogether in that tunnel did you work? I do not know. It might be 300 or 400 feet.  
 1061. Did you work in other lengths? Yes.  
 1062. How far off would they be? In other streets.  
 1063. All these lengths were well packed, were they? Yes.  
 1064. You took good care of that? Yes; to the best of my knowledge.  
 1065. You packed them with your own hand, and therefore you can be sure of it? Yes.  
 1066. Have you lately had any conversation with any member of the firm of Carter, Gummow, & Co.? No; I have never been near them.  
 1067. You did not work in any part of Contract No. 79? No.  
 1068. Have you worked upon any other contracts of Carter, Gummow, & Co.? Yes.  
 1069. The work there was all well done, was it? Yes.  
 1070. They generally did their work well? Yes.  
 1071. *His Honor.*] Did you work right along the piece between the two shafts you have named? Yes.  
 1072. You were not doing the whole of the packing? No; there were different men on the job.  
 1073. Was the work done by day, or night and day, in shifts? In shifts.  
 1074. You were not in the same shift with Dawson? Dawson would be at one end, and I should be at the other end. Two men go in at one end, and two at the other.  
 1075. Was the brickwork commenced in the middle of the space between the two shafts? Yes.  
 1076. You worked away towards one shaft, and he worked away towards the other? Yes.  
 1077. Were you going towards No. 13 or No. 12 shaft? Towards 13.  
 1078. Beginning in the middle of the drive? Yes. I think, however, that I made a mistake just now in the numbers of the shafts. I should have said that I worked between shafts 13 and 14.  
 1079. *Mr. Parkes.*] Where did Dawson work? From 13 to 14.  
 1080. And you were working from 14 to 13? Yes.

WEDNESDAY, 3 JUNE, 1896.

George Dawson recalled and further examined:—

1081. *Mr. Parkes.*] I want to impress upon you what an awful thing it is to give evidence which is false, and which may bring trouble to other people, and I want, also, to impress upon you that it is your duty to tell the truth when the truth is necessary. Never mind with what subtlety questions may be framed to draw certain answers from you, your replies must be truthful in so far as you understand the questions. Never mind what you have said to me in conversation, I want you to be clear and decided upon the truth of what you now swear to. In the first place, I want to ask you whether you know a man named Christian Hansen? I knew him by the name of "Chris." [*Hansen was called in, and identified by witness*]  
 1082. That man worked with you on Contract 79A, did he not? Yes.  
 1083. Did he, in a similar way to yourself, do any scamping? According to his own words he did.  
 1084. What did he say? He said he often ran two drums in the morning before the Inspector came.  
 1085. Meaning that he had not filled them properly, I suppose? Yes.  
 1086. Did he say that he did so himself? Yes.  
 1087. This man Hansen was dismissed from Contract 79A by Inspector Andrew, was he not? I believe Inspector Andrew told Manager Reid to shift him.  
 1088. Do you know of your own knowledge how Hansen came to be dismissed? We were all there together. Inspector Andrew said at the time that he had cautioned Hansen one or two days previously. At the time I am speaking of he came back and caught him again, and he told him then that he would have to go.  
 1089. Do you mean for scamping work? Yes.  
 1090. Did you hear any conversation coming down in the boat at night? Yes; as we were coming back at night Inspector Andrew said, "I told him before that he would have to go," and Manager Reid then gave him a note to go to Mr. Snodgrass, on the other job.  
 1091. That you know of your own knowledge? Yes.  
 1092. There is no doubt as to that being the truth? No.  
 1093. Were the other men present? Yes; the bricklayers were there. The labourers generally go together by themselves, and the bricklayers by themselves, but I think they would all have heard what was said.  
 1094. There is no doubt but that Hansen was dismissed through the action of Inspector Andrew? Yes; Inspector Andrew told Manager Reid he would have to remove him.  
 1095. And Manager Reid did remove him? Yes.  
 1096. For scamping work, as you yourself were doing? Perhaps it was not quite so glaring as the work in the piece I was on.

George Andrew sworn and examined:—

1097. *Mr. Parkes.*] You are an inspector under the Water and Sewerage Construction Branch, are you not? Yes.  
 1098. Were you an inspector upon Contract 79A? I was.  
 1099. Are you aware that defective work was done there? I am not.  
 1100. Have you heard rumours to that effect? I have.

G. Andrew.  
3 June, 1896.

1101.

- G. Andrew. 1101. You took every precaution to prevent defective work from being done, did you not? I did.  
 1102. You had occasion to caution a man named Dawson, had you not? No.  
 3 June, 1896. 1103. Did you not caution a man named Dawson about doing defective work? No.  
 1104. Did you not dismiss a man named Hansen for doing defective work? Yes.  
 1105. What was he doing? Inferior packing.  
 1106. And for that you dismissed him? Yes.  
 1107. Did you catch him at it twice or three times? Twice.  
 1108. And on the second occasion you dismissed him? Yes.  
 1109. In what way was the work defective? It was not rammed enough for my liking.  
 1110. Did you know of any drums which had not been filled by Hansen? No.  
 1111. Did not Hansen leave two drums unfilled near shaft 17? Not to my knowledge.  
 1112. There is no doubt, however, but that the man was doing defective work? I do not think he was.  
 1113. Why did you dismiss him? I caught him doing defective work on one occasion, and shortly afterwards I caught him again.  
 1114. *His Honor.*] Under whom was the work done? I could hardly tell you; Mr. Cook was the resident engineer.  
 1115. Under whom was he working? Under Mr. Griffiths.  
 1116. And under whom would Mr. Griffiths be working? Under Mr. Darley or Mr. Smailes, I presume.  
 1117. What would be the date of the dismissal of Hansen? I could hardly give you the date.  
 1118. Could you say approximately? It would be in the latter end of October, 1895.  
 1119. *Mr. Hickson.*] If I understood your evidence aright, you said you did not detect Hansen doing any bad work? When I go to inspect I always try the work. I do so in all cases. In this instance I found that the work was not properly rammed, and that was quite enough for me. The work was packed, but it was not sufficiently tight. I told him on the first occasion I caught him that if I caught him again I would have him shifted.  
 1120. No gaps or voids were left? Not that I know of.  
 1121. *His Honor.*] It was concrete packing, I suppose, over the crown? Yes.  
 1122. *Mr. Hickson.*] You were only on Contract 79A;—you were not upon 79? Only on 79A.  
 1123. Did you find any of the voids or holes in the packing which have been spoken of in any of the lengths upon 79A? No.  
 1124. And the work in Contract 79 you know nothing about? No.  
 1125. You know of no work which you would call defective on 79A? No.  
 1126. In this particular instance to which you have referred the packing was not tight enough, that is all? That is all.  
 1127. *Mr. Gummow.*] All the work upon the contract, as far as you know, is well done? Perfectly.  
 1128. When you caught Hansen doing the loose packing you have spoken of, did you dismiss him at once? I reported him to the manager, who told him he would have to go, and he was then dismissed.  
 1129. But before that, did you make Hansen do the work properly? Yes.  
 1130. You did not allow him to leave it in a bad state? No; I stopped there until he had done it.  
 1131. And the manager, you say, removed him? He did.  
 1132. Did he raise any objection, or did he at once remove him when you told him what the man had done? He removed him at once without raising any objection at all.  
 1133. *His Honor.*] How did you discover that the man was not ramming the concrete sufficiently tight? By going down and trying it.  
 1134. Before or after it was set? I asked Hansen if he had finished the drum, and he said "yes." I then took up the rammer and rammed it, and found I could disturb it.  
 1135. You found you could press it further in? I could not press it much to speak of, but it was not as solid as it ought to have been.  
 1136. What did you do then;—did you make him put some more in? Yes.  
 1137. And ram it tightly? Yes.  
 1138. Did you test any part of the work in any way after it was finished by going through the sewer;—did you adopt any plan to test whether the packing over the crown of the sewer was perfect? No.  
 1139. Can it be tested after the work is finished—after the whole of it is set;—is it not then practicable to test to a certain extent the solidity of the packing over the crown or to discover whether there is packing left out altogether by tapping? I do not think it could be done without cutting out.  
 1140. You do not think it could be done by tapping? I do not think so.  
 1141. Have you ever tried? I have tried all sorts of ways.  
 1142. And you have found it impossible to discover whether the work on the crown was solid or hollow? I believe it would be impossible to distinguish by merely tapping.  
 1143. *Mr. Hickson.*] You know Inspector Reid? Yes.  
 1144. He was not on Contract 79A at all? Not while I was there.  
 1145. Were you there from the commencement of 79A? No; from about the seventh month of last year.

Christian Hansen recalled and further examined:—

- C. Hansen. 1146. *Mr. Parkes.*] There is no doubt, I suppose, but that you have nothing to gain by telling a lie in this matter? I have not.  
 3 June, 1896. 1147. It is imperative in the interests of justice that all men who come here should swear the truth; all that you have to do is to say what is thoroughly true, and nothing else; you told me the other day that no defective work was done upon Contract 79A;—did you not then make a mistake? Well, I might have made a mistake.  
 1148. That answer will not do;—did you or did you not make a mistake? I did.  
 1149. Then you did do defective work? Yes; I did a length one day.  
 1150. You did a whole length wrong? Yes; in High-street.  
 1151. Did you leave a drum unpacked? I did not finish a drum.  
 1152. Did you not tell Dawson, a fellow labourer, that you left two drums unpacked near shaft 17? No; I never did.  
 1153. Did you not tell him that you left two drums unpacked somewhere? I never did. 1154.

1154. Were you not dismissed for bad packing? I was not. I never got the sack for that.
1155. Did not Inspector Andrew have you removed for doing bad work? I was going to tell you that Inspector Andrew came down to me when I had not quite finished a length and put a rammer into it. The ramming was not to his satisfaction, although there was plenty of packing in the length.
1156. Was not that the second time he caught you? Yes; he found fault with the ramming before.
1157. What was the nature of the bad work when he caught you the first time? The ramming was not to his satisfaction.
1158. Do you think it is likely that a man would be discharged from a job simply because the ramming was not sufficiently tight? I did not get the sack for that.
1159. You were removed;—what do you call that but the sack? I was not sacked. The manager simply sent me over to Annandale.
1160. He removed you from this job to another job of the firm's? Yes.
1161. Did Inspector Andrew know that you were going to another job of Carter, Gummow, & Co.'s? I could not say. The manager told me to go to the other job.
1162. As a matter of fact can you swear that the work you did upon the job was not scamped;—mind there are means by which it can be thoroughly tested? It was done to the best of my knowledge and the inspector's satisfaction.
1163. That will not do;—did you scamp any work;—did you leave any drums hollow? Not hollow.
1164. You are sure of that? Yes.
1165. Near what shafts did you work? I could not tell you the number of the shafts.
1166. Could you not tell the number of the shafts from where you got out of them? I could not.
1167. You had a conversation the other day with Inspector Board in one of the ante-rooms of this building? Yes; I had a talk with him.
1168. What did he say to you? He said nothing.
1169. Then what was the nature of your conversation? He said nothing to me.
1170. *His Honor.*] If he talked to you he must have said something;—what did he say? He asked me about Inspector Andrew's coming down, and whether I was asked any questions about that length? I said that I had been asked questions.
1171. *Mr. Parkes.*] In other words, he asked whether you had told the Commission about that incident? Yes.
1172. What other conversation had you? That is all he said.
1173. How long was he speaking to you? About four or five minutes.
1174. Was he not there a quarter of an hour? He might have been.
1175. Was he not with you a quarter of an hour in the ante-room? He might have been. I was not speaking to him all the time.
1176. Were you not the only two persons there? No; there were more there.
1177. How many more? A good few persons.
1178. You had told the Commission that you worked between shafts 13 and 12, had you not? Yes; and I was told that I had made a mistake in the numbers of the shafts, and that I was working between shafts 14 and 13.
1179. Who gave you that information? Well, Inspector Board asked me what I had said.
1180. And it was he who gave you the information? Yes.
1181. After you had given your evidence the other day? Yes; he said I had made a mistake in the numbers of the shafts.
1182. And he sent you back in the room to correct the mistake? Yes.
1183. Is Inspector Board an inspector of the Metropolitan Water and Sewerage Construction Branch? Yes.
1184. Was he an inspector over you at any time? Yes.
1185. He knew you very well then? He knew I had been working on the job.
1186. Did he not persuade you to come in and give the evidence you gave on Monday? He did not.
1187. Did he not speak to you about the evidence you were to give on Monday before you came into the room? He did not.
1188. You have already said that he talked to you about the nature of the work you did between certain shafts? He asked me if I was asked that question inside.
1189. *Mr. Gummow.*] What was the nature of the work to which Inspector Andrew applied the rammer? It was not what you might call bad work, only the ramming was not to his satisfaction.
1190. And did he make you do the work properly? Yes.
1191. You had to make it good before you came away? Yes.
1192. Then you were removed off the contract after that day? Yes; manager Reid came and told me I had better go over to the Annandale job. I did not get the sack.
1193. Were you put on to a different class of work there? Yes; he said I could have a job on top. The job at the other place was nearly finished.
1194. What work did you do at Annandale? Concrete.
1195. On the surface? Yes.
1196. *Mr. Parkes.*] If you were made to repair the defective work you did why were you removed? I could not tell you that. The job was nearly done.
1197. *Mr. Gummow.*] If you were found doing loose work would not the man in charge of the work lose confidence in you? I should not think so.
1198. Would he expect you to do good work on the following day? No, I do not think so.
1199. Would you not take it as a sign that a man had lost confidence in you when he requested that you should be removed? Well he told me that I should have a job on top.
1200. Would not that show that he was dissatisfied with the work you had done below? Yes.
1201. Is it not natural that he should lose confidence in you if you did loose work below? Yes, he might do so.
1202. For the sake of the work, is it not natural that the inspector looking after it should see that good work was done, and would he not prefer having a man he could trust to a man he could not trust? I should think so.

Robert George Reid recalled and further examined :—

- R. G. Reid  
3 June, 1896.
1203. *His Honor.*] I believe you wish to make some explanations and additions to the evidence you gave the other day. You said in your evidence, "I called on Mr. Boys, and he asked me to explain why it was, or if it was true that I was at one end of the drive most of the time. I told him it was true, and I explained the reason, with which he was satisfied." You wish to give the explanation you offered to Mr. Boys, I understand? Yes. When I went down below I went into both ends of the drive and examined the points where the bricklayers were laying the bricks. I could see that at one end the bricklayer would have to cut a piece off the top of the drive or split the bricks, as he laid them. The other man had plenty of room, and even if he had built his length I could examine the work better than I could in the other case if the man had built only two courses. That was my reason for remaining at the one end.
1204. That was your reason for keeping so close to the man whose work was near the top of the drive? Yes. The bricklayer would have to split his bricks or scabel the top of the drive to get room between his centre and the crown, and I disallowed it.
1205. Is that the reason you gave to Mr. Boys? Yes.
1206. At another point of your evidence you were asked if you had had any conversation with a member of the firm of Carter, Gummow, & Co., and you said, "With Mr. Snodgrass";—have you any explanation to offer in regard to that? A week or a fortnight before Christmas—I am not very sure about the time—Mr. Snodgrass came down No. 5 shaft, accompanied by Inspector Vincent. He came into the end where I was, and he asked me about a brick which was chipped, and which I had reported to Inspector Fowle. (*Vide Appendix 6*). He asked me why it was I could not get on better with the men. I said I should get on very well with the men if they would do what was right, but that I could not allow a brick of that kind to go unnoticed. He said, "Very well, will you come up on top?" I said, "No, thank you; I am not paid for being on top." He said, "I will promise you that nothing will go wrong while you are up on top." I said, "I must decline the offer, Mr. Snodgrass. I will stay below, and then I will be sure there is nothing wrong."
1207. Is that all you wish to say regarding the conversation? Yes. He went away then, and I believe he gave the two bricklayers some money, because the bricklayers and the labourers went to the mouth of the tunnel, where they had some conversation, and then went up on top.
1208. And did what? When they went up on top I rang for the bucket to come down. I wanted to go up for my lunch. There was no one there but the man who pulled me up with the engine. The others had evidently gone away somewhere. They came back in about half an hour to the engine-house. I was having my lunch there. They had two or three, or perhaps more, bottles of drink of some description. I believe it was ale.
1209. Who had? The bricklayers and their labourers. They came into the engine-house a few moments afterwards. Mr. Snodgrass also came. He had some drink, and he offered it to me. He said I would be a better man if I took it.
1210. What did you say to that? I said that was a matter of opinion.
1211. Did you take any? I did not. Then they had a few songs and recitations. They asked me to sing. I said I had no objection to being sociable both with Mr. Snodgrass and the men, but I must decline anything else, as it would be very pretty to see a paper coming into the office stating that Inspector Reid had been found drinking and singing with the men in No. 5 engine-house. Mr. Snodgrass said, "I can promise you that it will never go to the office." I said, "I can promise you that I do not intend to do it."
1212. That was at knock-off time, I suppose? It was the meal between the shifts. They go on at 7 and come off sometimes at 11 and sometimes before. On this particular night they came off before, I believe, because they thought the public-house would be shut up at 11. On that account they knocked off a little earlier, I think.
1213. *Mr. Parkes.*] Referring to your answer to question 347, and your expression that you thought the Department ought to see the thing out, evidently what you meant was that they ought to have retained you, and to have had the bad work upon which you had reported put right? I did mean that.
1214. In addition to that, you also meant that they ought to have kept you upon Contract 79? Yes; if it was their opinion that I had done right.
1215. Do you know an inspector named Board? I know a gentleman of that name. He was a clerk in the Sewerage Department for two or three years, and I believe he is now on some work.
1216. Do you know by sight a labourer named Hansen? Yes; I saw him here the other day when he was giving evidence.
1217. Did you see Board take him into one of the ante-rooms of this building the other day? No; but I saw them talking in an ante-room. They were talking when I went in.
1218. How long were they talking? I do not know. I came away when I saw that they were talking. I did not want to hear what they were talking about, and I came round to the other passage.
1219. How long were they in that room together? I could not say how long they were there. It was after 11 o'clock when I came here, and I did not go away until after 12 o'clock, and they were here when I went away.
1220. *His Honor.*] By ante-room you mean a room adjacent to this room? I mean the room in which witnesses wait until they are required to be examined.
1221. *Mr. Hickson.*] You were not an inspector upon Contract 79A at all? No.
1222. You said the other day, I understand, that actually no bad work was done upon Contract 79. What you complained of was in one case a broken brick, and in the other case of two and a half barrow-loads of dry stone being thrown down a shaft;—you said you did not know of any actual bad work? That is a matter of opinion. The only thing an inspector can do if he sees anything wrong is to report it to the officer in charge. If he chooses to take notice of it, and if he thinks the work defective, well and good—he can please himself. In this particular case anyone could have examined the work. It would have been no trouble while the joints were green to go and pull out a brick to see whether I was right, or whether the contractors' men were right. I reported the second matter to which you refer as soon as Inspector Fowle came on to the job on the Monday morning, and Mr. Davis afterwards held an inquiry. It would have been easy for Mr. Davis then, if he thought that more than two barrow-loads of dry stone had been sent down, to examine the work.
1223. You did not follow up the two barrow-loads to which you referred to see whether they went into the work in a dry state? I did not. I have already given my reasons. 1224.

1224. You were not the inspector in charge—you were only one of the inspectors? I was the second inspector. When Inspector Fowle went away at 5 o'clock he would leave me in charge. I had not only his instruction, I had the specification. R. G. Reid,  
3 June, 1896,
1225. *Mr. Gummow.*] With regard to this matter of Mr. Snodgrass and the men having a bottle or two of beer to drink, was it not about Christmas time? I believe it was about a week before Christmas.
1226. And I suppose it was some little Christmas cheer he was giving them? I do not know whether it could be said to be Christmas cheer. I do not think Christmas had started then.
1227. Did Mr. Snodgrass himself have a few drinks? I believe he did.
1228. As a matter of fact, it is his misfortune at times to be a little too liberal with his cash? I am sorry to say it is.
1229. Since a good deal has been said about talking to witnesses before they give their evidence I should like to ask you a question upon the same point;—did you talk to any witnesses either before or after you had given your evidence; did you meet any witnesses and have a talk to them? Knowing all the men as I do I daresay I have talked to some of them.
1230. Is it the usual thing for the men to yarn away with one another on all sorts of subjects? I do not know whether it is or not.
1231. But it is so—as a matter of fact, is it not? They do talk.
1232. Do not you do so yourself? Yes; I talk sometimes.
1233. Do you know of any defective work upon the contract you have been speaking of except that which you yourself reported on as defective? No; if I knew of any I should consider that I failed in my duty if I did not report it to the Department—not to this Commission, because my reports were made, two years ago, not to the Commission, but to the Department.
1234. But do you know of any defective work besides that which you reported upon? No.
1235. And all that you know of in the way of defective work is this—that you saw two and a half barrow loads of dry stone going down one of the shafts? About that.
1236. It was not two and a half cart-loads? No; if I had seen that quantity I certainly should have said so.
1237. You were shifted off Contract 79 on to another contract? Yes—Contract 89.
1238. Who had that contract? Phillips and Rhodes.
1239. *Mr. Parkes.*] When you were with Phillips and Rhodes you had no difficulty in getting proper work carried out? No.
1240. How long were you upon the contract? For six or seven months.
1241. You had no difficulty there on account of any friction with the men? No.
1242. You got proper work done without any difficulty whatever? Yes.
1243. *Mr. Gummow.*] With the exception of what you reported did you get proper work done on Contract 79? With the exception of what I reported, but I had a great deal of trouble.
1244. *His Honor.*] I understood you to say that by knocking some bricks out of the side of the shaft where the packing was doubtful it could have been discovered at once whether dry metal had been put in as packing or not? Yes; it could have been very simply done while the cement and bricks were green. It would have been easy for the inspector in charge to say, "This bricklayer has done so many feet upon this shift; we will tap the work here; that is about the place where the dry metal would have been put in." I had a place ready to point out to anyone who might have thought it necessary to examine the work, but the work was never examined.
1245. Of what thickness was the wall in the shaft? About 9 inches.

Robert Rowan Purdon Hickson recalled and further examined:—

1246. *Mr. Parkes.*] On 3rd April, 1893, an agent for Messrs. Carter, Gummow, & Co., named Armstrong, wrote to you asking that the patent for what is known as the Monier arch might be purchased by the State for £1,500, did he not? Yes. [*Vide Appendix No. 7.*]
1247. Was not Mr. Ohlfsen-Bagge an officer in your Department? Yes.
1248. At what time did he leave? I think he left in the July retrenchments of last year.
1249. He was an officer of your Department when this patent was offered to the Government for the sum of £1,500? I could not tell you the exact date of his leaving.
1250. You did not at that date know anything about this Monier patent? Oh, yes, a good deal.
1251. Then why did you write to Mr. Bagge on the subject? We had considered the question for some time. [*Vide Appendix No. 9.*]
1252. Did you not use words to this effect, "Does Mr. Bagge know anything about this patent"? I used those words because I knew that he had gone into the question. As a matter of fact, I had at that time put up a small culvert on the Parramatta Road on the Monier system.
1253. When you sent word to Mr. Bagge, had you done that? Yes.
1254. Then why did you write this minute on the 12th April, 1893: "I find Messrs. Carter & Co. have patented in Australia 'Monier's Patent Concrete Arch'; this arch has been under my consideration for some time, long before it was patented here, and as soon as funds are available I have arranged for the erection of a small culvert on this principle without a patent fee. In any case I could not recommend compliance with this request";—why did you write that minute if you had already given the patent a trial on the Parramatta Road? I had not then given it a trial, but I had arranged for it to be put up.
1255. The next stage of this patent coming into the office was when you tested it on the Parramatta Road, was it not? The next stage was, I think, when the designs for the aqueduct in one of these contracts were sent in.
1256. When was that? They came in with the tender.
1257. On what date? On the same date as all the tenders for Contract No. 77.
1258. That was on 14th March, 1895, was it not? That is not the actual date of the receipt of the tender. It is the date on which it was dealt with.
1259. They were dealt with on 29th March, 1895? Yes.
1260. Did you not, on the 18th July, 1894, write this minute to the Minister: "The Monier system of concrete arching has been patented in the Colony by Messrs. Carter & Co. Where applicable, it reduces the cost of spanning an opening by about 50 per cent. The patentees are willing to allow the Department

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to use the patent on payment of a royalty of 15 per cent. on the cost of the arch. I recommend this for the Minister's approval. I might state I have just completed (with the permission of the patentees) a culvert on the Parramatta Road, built on this principle, with most satisfactory results, financially and otherwise";—that is your minute, I suppose? Yes. [*Vide Appendix No. 10.*]

1261. You admit that this work can be done in the arch at a cost 50 per cent. cheaper? On road bridges where there is a good width, but not in the case of a narrow bridge such as that of an aqueduct.

1262. If it be applicable to an arch in one case, must it not be applicable in another? No. You evidently have not gone into the question.

1263. For what reason would it not be applicable? There are two strains in an arch. It is subject to a lateral strain and a downward strain. A road bridge with a wide roadway is a different construction in every way from a narrow aqueduct.

1264. What do you mean by different? On account of the side strain.

1265. *His Honor.*] What you mean is that in the case of a road bridge there is no allowance to be made for a lateral strain? You have a great width of road in which you can arrange for the lateral strain. In the case of a narrow bridge, as in an aqueduct, it is most difficult to do that, because you have such a narrow structure to go upon. I have strong evidence in papers, which I will bring forward presently, showing that my estimate is an under-estimate, and that there would be really a saving of 60 per cent. in the case of road bridges. In the case of an aqueduct or narrow bridge there would be nothing like that saving.

1266. And, as a matter of fact, it would have to carry a dead weight? Yes.

1267. *Mr. Parkes.*] Have you not a framework of quarter-inch iron rods running right through the structure? Yes.

1268. And are they not a tie against all wind pressure? Yes.

1269. In the case of a road bridge, where heavy vehicles carrying tons are passing over it, would the work not necessarily be more costly than in the case of an aqueduct? As a matter of fact it is not.

1270. Seeing that these iron rods are put through this aqueduct, in what particular do they require to be stouter to resist the wind pressure than they would require to be to resist the vibration caused by heavily-loaded carts? They have not to be stouter with regard to the downward pressure, but they have to be much stouter with regard to the side pressure, because you have not the width of bridge to arrange for your cross-ties.

1271. Not specifying the difference between roads or aqueducts, you recommended that the patent should be used generally throughout the Government service because the cost of the works would be 50 per cent. cheaper? Yes.

1272. And you recommended that 15 per cent. should be paid upon the cost of it? Yes.

1273. Carter & Co., on 2nd February, 1894, wrote a letter upon your own office paper undertaking to accept that? Yes. [*Vide Appendix No. 11.*]

1274. And it was accepted? Yes.

1275. And the contract is now entered into? There is really nothing at all in what you are speaking of which applies to this particular contract. This was a general approval which I obtained wherever I thought it advisable to apply the system to the road bridges of the Colony. As a matter of fact it has not yet been so applied, except in the case of one small bridge on the Parramatta Road.

1276. As a matter of fact, have not Carter & Co. a legal right to get this percentage upon all work of the kind done by the Department? On any work we did of the kind most unquestionably.

1277. What would be the next stage of the introduction of this patent into your Department? The next stage would be the receipt of tenders for Contract 77.

1278. Accompanying those was a lump-sum tender from Carter, Gummow, & Co. on the Monier arch principle? Yes; that came in at the same time.

1279. This tender was sent in on 14th March, 1895? Yes.

1280. Did not Carter, Gummow, & Co. undertake to carry out your original plan and specification at 28½ per cent. below schedule rates? Yes.

1281. Is not the document I hand you the original schedule which you issued for your own work for stone, brick, and concrete? Yes.

1282. That was the schedule issued to the contractors? Yes.

1283. It is the schedule upon which Carter, Gummow, & Co., McSweeney, Carson, Gilliver and Curtis, Holloway Bros., and other contractors submitted their tenders? Yes.

1284. The next step taken was to send tenders to a Board of Reference? Yes; after they had been examined by the Department.

1285. Of whom did the Board of Reference consist? At that time it consisted of Mr. Barling, the Under Secretary for Public Works, Mr. Darley, then Engineer-in-Chief for Harbours and Rivers, Mr. Deane, the Engineer-in-Chief for Railway Construction, Mr. Vernon, the Government Architect, and myself, as Commissioner for Roads.

1286. You reported to that Board upon this particular contract of Messrs. Carter, Gummow, & Co., did you not? Yes.

1287. Will you please tell His Honor what you reported to the Board in reference to the Monier arch? The report of the Board of Reference, which you will find at the foot of page 206 of the Parliamentary paper, ordered to be printed 22nd October, 1895, is the result of the conversation which took place.

1288. What did you say to the Board? When this tender came in on 14th March it was arranged that the sewerage works should be taken out of my hands and handed over to Mr. Darley. I brought the tender and the plans down to Mr. Darley, and we talked over the matter for a considerable time. The result of the conversation was that we both thought it desirable that an opportunity should be given of testing the Monier arch principle, which was acknowledged by all engineers on the Continent to be a very valuable engineering structure, and that the matter should be considered by the Board of Reference. The papers were then sent down to the Board of Reference without any direct recommendation from myself or Mr. Darley. We talked the matter over at the Board of Reference, and the paper to which I have referred you upon page 206 is the result of the conversation.

1289. Did you not report to the Board that the use of this patent would result in considerable economy? No, not in this case. I believe it eventually will; but it will not on this particular plan, because it is an expensive plan of the Monier arch.

1290. Will you tell me why the Board of Reference reported to the Minister, "In view of the fact that  
Messrs.



Messrs. Darley and Hickson are satisfied that the principle is a sound one, and that the adoption of the plan will result in considerable economy, we are prepared to endorse the recommendation of these gentlemen, and now submit the matter for the Minister's consideration";—how did the Board of Reference come to make that report to the Minister? I suppose it was in accordance with their firm belief.

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1291. But why did they report that Messrs. Darley and Hickson were satisfied that the adoption of the plan would result in considerable economy? I believe that the introduction of the system into our public works will result in ultimate economy, but there will not be much economy in the case of this particular structure, because it is very much too strong for the Monier arch principle.

1292. Besides informing the Minister on 18th July, 1894, that it would be 50 per cent. cheaper, did you not also inform the Board of Reference that it would be so? I did not.

1293. Are you sure you did not? Quite certain.

1294. Did you tell the Board that it would be reduced by  $28\frac{1}{2}$  per cent. upon the quantities? I do not know what you mean.

1295. Carter, Gummow, & Co. tendered on the original plan for  $28\frac{1}{2}$  per cent. below schedule rates? Yes; making the amount come to £15,500.

1296. Did you report to the Board that Carter, Gummow, & Co.'s tender for the Monier arch was on reduced schedule quantities? There was no occasion to report anything. They had their tender of £15,500 before them.

1297. But did you report to the Board that that amount was made up on Carter, Gummow, & Co.'s tender or on the office amounts? I did not report anything; the tender was there for the £15,500.

1298. In what manner did you impress the Board with the fact that there would be considerable economy from the adoption of the principle? I brought before the Board evidence in connection with the Monier arch principle, which I am prepared to bring forward now.

1299. Carter, Gummow, & Co.'s tender was  $28\frac{1}{2}$  per cent. upon the plans that accompanied the tender? Yes.

1300. Were these tenders called upon the Monier arch principle at all? No.

1301. Public tenders were called for an arch? Yes.

1302. And Carter, Gummow, & Co.'s tender was  $28\frac{1}{2}$  per cent. below your figures and quantities? Yes.

1303. Did you inform the Board of Reference that Carter, Gummow, & Co.'s price for the Monier arch was on the reduced quantities or not? Certainly not. It had nothing to do with the matter.

1304. Why not? Because they sent in a design of their own. They did not give any quantities. They said they would do the work for £15,500, and it was for the Board to say whether they would accept the tender or not.

1305. How did you arrive at the sum of £15,500? I did not arrive at it at all; it was the contractor's tender.

1306. If you recommended the acceptance of the tender as being a considerable economy, surely you went into the quantities? I did not.

1307. *His Honor.*] You did not then go through the quantities to see whether the tender was or was not a fair one upon the Monier basis? Not at that time. It was done afterwards, and of course I can give the figures.

1308. *Mr. Parkes.*] But you induced the Board of Reference to advise Mr. Young to adopt the Monier arch because it involved considerable economy, did you not? I did not say that it would lead to economy in this case. As a matter of fact there will be very little economy upon this special design.

1309. Was there no schedule made up to arrive at the exact amount of £15,500? I do not think there was. I think that sum was given in.

1310. Did the contractors make up a schedule? I should like to refresh my memory, but I think not.

1311. Did they go through the amount with any of your officers? Not to my knowledge.

1312. Upon 9th September, 1895, did you get a letter from Mr. Griffiths, Supervising Engineer, Metropolitan Sewerage Construction, to this effect: "Will the Engineer-in-Chief kindly approve the accompanying schedule of prices for use in preparing progress vouchers in this contract, the price for which is 'lump sum.' It will be observed that quantities are slightly altered from original. This has been done in order to provide for Monier work, which has been substituted for brickwork";—you received that letter, did you not? No; Mr. Griffiths was not an officer of mine.

1313. Did not a Mr. S. Adams tender on a copy of it? I do not remember. In any case, Mr. Griffiths was not an officer of mine, and he could not have reported to me.

1314. Were you not Engineer-in-Chief on 9th September, 1895? No. Mr. Darley was Engineer-in-Chief for Sewerage Construction. I was Engineer-in-Chief for Public Works.

1315. You were Engineer-in-Chief for Public Works? Yes. I had nothing to say to this contract.

1316. Is not the letter written to you as Engineer-in-Chief for Public Works? No; it is written to Mr. Darley, and you will see Mr. Darley's approval upon it.

1317. Did not Mr. Barling note this and have it sent to you on 11th September, 1895? I do not think so. It is a letter from Mr. Griffiths, who was Mr. Darley's supervising engineer, written on 9th September, 1895. I had given up charge of these works in the previous April. This is a recommendation to Mr. Darley. He approved of it, and it was noted by Mr. Beveridge and Mr. Adams, and a copy was sent to the Engineer-in-Chief. That is the whole matter. I must take exception to your incorrect reading of the title of the officer to whom the letter was addressed. It was addressed to the Engineer-in-Chief Metropolitan Sewerage Construction. [*Vide Appendix No. 12.*]

1318. Will you look at this schedule;—are not the printed figures the same as in the document I have already shown you in connection with Contract 77? I have not gone through them, but I suppose they are.

1319. Is not this schedule with the prices attached the schedule and prices upon which the contractors have been paid for this Monier arch? I do not know. I never passed a voucher for it. It is the first time I have seen this document.

1320. Did you not on 27th March, 1895, receive from Mr. Young, the Minister, after this tender was submitted, a minute to this effect: "Before approving of this proposal I should like an estimate of the actual value of the work to be carried out by the contractors under the substituted scheme"? Yes.

1321. For what reason did you not make that schedule;—you had a number of officers to take out the quantities? The reason is given in the next minute.

1322.

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1322. What was there to prevent your getting one of your officers to take the quantities out? Nothing but the time. I think I said it would take a week.
1323. The minute was signed on the 28th March, 1895, and the contract was not signed until 16th May, 1895? I do not know when the contract was signed. It was not in my charge.
1324. Do you not see from the papers that the contract was not signed until 16th May? That is apparently the date.
1325. Then there was not time in the two months to have the quantities taken out? Yes, if necessary; but I had the information I wanted.
1326. As a matter of fact, could they not have been taken out in two days? No, indeed they could not.
1327. Could the quantities be taken out in a week? Yes; I suppose there would be about a week's work. I think I said so.
1328. On 28th March, 1895, you wrote to the Minister as follows: "To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm estimates were made for the work on the Monier system as well as on the Department's design. The result was that the estimate of both works was practically the same. Applying that comparison to this case, it would mean that the Departmental estimate for the work under consideration would be £22,000"? Yes.
1329. Are you aware that, taken on the Department's own figures, without the 28½ per cent. of Carter, Gummow, & Co.'s tender in reduction of the quantities, they run out to make only £15,500? I was speaking of the Departmental estimate for the work.
1330. That has nothing to do with it? That is everything to do with it. It is what I am alluding to.
1331. You say that if the quantities were taken out the result would be that the price would amount to £22,000? Upon the same basis.
1332. Are you aware that the contractors are now being paid upon the original office amounts to each number of the schedule? I do not know how they are being paid.
1333. According to you the quantities of both works would be practically the same? Yes.
1334. Then are you aware that there is an item on the original plans prepared by you of brickwork, 2,020 yards, at 50s. a yard? Yes.
1335. That was reduced from 2,020 yards to 150 yards? Where?
1336. Upon the Monier arch? I do not know.
1337. Are you aware that there is an item for sandstone concrete in your original plan, 2,350 square yards, which in the case of the Monier arch is reduced to 1,800 yards. I mean item No. 19, at 28s.;—are you aware of the reduction in that case? I am not, indeed. I do not know it to be a fact, because it was not done in my office at all.
1338. These quantities were made out by one section of the Works Department? I do not know where they were done.
1339. Are they not the quantities upon which the contractors are being paid? I do not know.
1340. Do you know that the item contained in your original plan of Pymont bottom block sandstone ashlar, 13,250 cubic feet, is entirely taken out in the case of the Monier arch? I do not know that it is.
1341. Is that in the schedule upon which the contractors are being paid? I do not know about that schedule.
1342. Are you aware that there is an item also for special cement facing, 1 to 1—not 2 to 1—2,750 yards, at 2s. 6d., and that that is entirely omitted in the case of the Monier arch? I could not say.
1343. You heard Mr. Darley's evidence on Monday? Yes.
1344. You heard him say that when he took over Contract 77 the foundations of the piers were in? I believe he did say so, but I think he corrected the statement afterwards. As a matter of fact there was not anything done.
1345. You will notice upon page 208 of the Parliamentary papers, from which I have been quoting, that after the contract was drawn up, or just at that time, it was advised by Mr. Norrie that Mr. Darley's name be substituted for yours? Yes.
1346. So that really the contract was signed upon your recommendation, and was accepted upon your recommendation—that is to say, you were the engineer for this work when the contract was accepted? I was one of the officers who recommended its acceptance. The tender was accepted on 11th April, and I was not in charge after 2nd April.
1347. Mr. Darley did not take over the work until July? He personally took it over then, but he had been away, and an officer of his had taken it over from 2nd April.
1348. And this contract was let, you say, on 11th April? Yes; ten days afterwards.
1349. It was practically let by you, then, and handed over to Mr. Darley? No. I gave up complete charge of these works on 2nd April. I was gazetted out then, and the acceptance of the tender was dated 11th April, ten days afterwards.
1350. Upon whose recommendation did the Minister approve of this contract? The recommendation made by Mr. Darley and myself and the Board of Directors.
1351. Did you not write the minute to Mr. Young upon which the contract was accepted? I wrote the minute you have read.
1352. The whole of the letting of the contract was done upon your advice? Upon my advice and that of the Board of Reference.
1353. Did you not write the final minute upon which Mr. Young undertook the tender? Yes.
1354. Where can we find in these papers the calculations showing that the quantities and prices of the Monier arch would make it equivalent to the Government plans? In the papers laid upon the Table of the House on 9th October, 1895. You will see it on page 5.
1355. What is contained in that summary? It gives an estimate of three separate schemes for carrying the sewer overground.
1356. Is this work not being carried out under No. 2 scheme? Is not that the scheme going on at Johnstone's Creek, Annandale? No; that is being carried out somewhat similar to No. 3 scheme.
1357. That is at the rate of £6 6s. 8½d. per lineal foot? Yes.
1358. As a matter of fact, was not Mr. Bagge's estimate for Ahearn's work based upon a single sewer, instead of upon a triplicate sewer? It is a triplicate scheme.
1359. But the basis is a two-sewer system? No—triplicate.

1360. Then Ahearn's proportion per foot will be over £15 per lineal foot, as against £6 6s. 8d.? I do not know how you make that calculation out.

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1361. You say these estimates are carried out upon a triplicate-sewer plan? Yes; all these three schemes. 3 June, 1896.

1362. And is Ahearn's based upon a triplicate system, too? Yes.

1363. But Mr. Bagge makes Ahearn's cost per lineal foot £10 16s. 1d. and No. 3 scheme £6 6s. 8d.? If you look at the summary you will see that No. 2 is estimated to cost £6 16s. 11d. per lineal foot. The same scheme upon the Monier arch principle would cost £6 6s. 8d., so that the two are practically the same.

1364. *His Honor.*] Perhaps you had better make a statement as to the actual facts? The actual facts are these: When we were arranging for the sewer in connection with the sewage farm three schemes were got out, in order that we might see which would be the most economical. No. 2 scheme—the one which is being carried out—was estimated to cost £6 16s. 11d. per lineal foot. The third scheme, upon the Monier arch principle, was estimated to cost £6 6s. 8d. per lineal foot, or, as I said to the Minister in my minute of 28th March, 1895, practically the same.

1365. Are not these three schemes summarised in the papers all variations of the Monier system? No.

1366. Are the schemes all concrete? Well, No. 2 has brickwork in it, I think; but it is practically concrete.

1367. Through all these three schemes does not the iron rod run which makes the Monier patent? No.

1368. Then why have they here  $\frac{3}{4}$ -inch wrought-iron bond rods in No. 2? They have, but it is not the Monier system.

1369. Are they not different kinds of the Monier system? Certainly not.

1370. *Mr. Parkes.*] Mr. Bagge says:—

These designs are herewith submitted for the consideration of the Engineer-in-Chief, each design with an open aqueduct carried upon arches and piers. The aqueduct, or main carrier, is capable of discharging 11,000 cubic feet of sewage per minute, which is equal to two 6-foot diameter outfall sewers, running three-quarters full, with a gradient of 1 in 2 000.

The sewerage aqueducts have hitherto been constructed here in such a manner, method, and of such materials, that any competent tradesman, in his special line, obtainable in the Colony, could do the work.

Now, however, as it is a matter of the greatest importance to reduce the cost of the works, there seems to be no other way of accomplishing this object but to adopt for this Colony a more or less experimental system of construction for these aqueducts—of increasing the spans of arches, introducing arches with joints, of constructing the whole in concrete, and of constructing the whole of the work of concrete and mortar and iron.

In the old Home countries these novel systems of construction have caused in the commencement failures, owing to the works being carried out by more or less inexperienced and untrained engineers and artisans; hence the various State Governments would not entertain and construct works on these novel methods until special companies established themselves, who made it their special business to carry out such works with artisans who had had time to gain the necessary experience, and who had been practically and specially trained in the construction of such work.

It was only to such companies that works, which are termed purely and simply specialities, were entrusted, after they had given adequate security for the faithful, careful, and competent execution of same.

Now let me refer you to what you say in your minute of 28th March, 1895:—

To comply fully with the Minister's minute would mean the taking out of quantities in the plans submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewerage farm estimates were made for the work on the Monier system, as well as on the Department's designs.

You will see that there is not the slightest doubt about the three plans being upon the Monier system, and about their being made to compare with the office work;—do you not see now that they are all upon the Monier principle? No.

1371. Then why did you report to the Minister that they were? I did not.

1372. Did you not say when plans were being prepared for the extension of the sewer to the sewage farm estimates were made for the work upon the Monier system, as well as upon the Departmental design? So they were. You will see from the papers that No. 2 scheme, which is being carried out, was estimated to cost £6 16s. 11<sup>3</sup>/<sub>4</sub>d. per lineal foot, and that the Monier arch scheme was estimated to cost £6 6s. 8<sup>3</sup>/<sub>4</sub>d. per lineal foot.

1373. Did Ahearn's plan include twelve 18-inch diameter 30-foot long piles, rubble-stone packing at top of piles, 3 feet deep, &c.? I think so. You can find out exactly from the specification.

1374. Will you swear that that is so? No; but my impression is that that was his scheme.

1375. Will you swear it definitely? Not without seeing the plans.

1376. At this point I should like to ask you when your son left this Colony? About five weeks ago.

1377. On what date? Some little time before the opening of Parliament, I think.

1378. You do not recollect the date? I could not say from memory.

1379. Was it on a Friday or a Wednesday? It was on a Wednesday he left. I should say it would be this day five or six weeks ago.

1380. On the 1st May was he not entertained by the North Shore Cricket Club at a dinner? I should not like to give a definite date.

1381. He left four days after that, did he not? The entertainment to which you refer was on a Saturday evening, and my son left on the following Wednesday.

1382. Are you sure it was not on a Saturday he left? No; he was to have gone on the Saturday, but the boat did not go.

1383. Parliament met on the following Tuesday? I think so.

1384. Did you tell Mr. Young that he left some months before the meeting of Parliament? No. [*Vide Appendix No. 13.*]

1385. Then how came Mr. Young to tell the House so? He made a mistake in saying months; he should have said weeks.

1386. As a matter of fact it was not even weeks—it was only days? I do not know how Mr. Young came to make the mistake. It was a slip, and I told him of it afterwards.

1387. I understood you to say just now that you had not before seen the documents I handed to you containing the schedule of prices and Mr. Griffiths's letter? No, I had not.

1388. Did you not take them from this room on Wednesday last, in order that a copy might be made of them? No.

1389. You did not then peruse them? No.

1390. It is a most singular thing that when I saw them last week they had no marks of checking upon them. Since their return I notice these marks upon them. They must have been made by you or your officers? Why should they be made by me? 1391.

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1391. You had not seen the document before you saw it to-day? No; as a matter of fact I had not. Upon inquiry, I may say that I found that my son received notice from the contractors that his services would not be required upon 1st April, and that he left here on 6th May.
1392. If you look at the contract plans of No. 101 contract, signed by John Ahearn, you will see that there are no iron tierods? That is not the second scheme. [*Vide Appendix A.*]
1393. The second scheme is not John Ahearn's contract? No.
1394. Did you not say just now that it was? I said it was one of these contracts. As a matter of fact the plan to which you refer is not Ahearn's;—it is McSweeney's.
1395. And it is not on the Monier principle? No.
1396. Did not Mr. Bagge take out these No. 1, 2, and 3 Monier arch tests on no particular job? They were taken out in connection with the extension of a contract which was afterwards let to McSweeney. The plan before you is the plan from which they were taken. [*Vide Appendix No. 8.*]
1397. This is not a signed plan at all? The original is not here yet, but it will be sent down.
1398. There is a foot-note to this effect in Mr. Bagge's report:—"Mr. Ahearn's present outfall sewer, Contract No. 101, if calculated for two sewers of 6 foot diameter would cost £10 16s. 1d. per lineal foot"? That note refers to the last paragraph of the report, I suppose.
1399. *His Honor.*] Was that calculation made upon a triplicate sewer? This report refers to the three different schemes which actually were not in existence. This foot-note of Mr. Bagge's applies his calculation to another contract that actually was in existence. [*Vide Appendix B.*]
1400. But what is the meaning of the words, "If calculated for two sewers of 6 feet diameter"? Your Honor had better ask Mr. Bagge, I think; I confess that I do not understand it, and I never did.
1401. *Mr. Parkes.*] The plan was drawn in your office, under Mr. Bagge? Yes. You are referring, I suppose, to No. 2 scheme, with a price of £6 16s. 11d. per lineal foot. That is not on the Monier principle. There is not an iron tie-rod in the arch in that case.
1402. In your minute of 28th March, 1895, you say, "When plans were being prepared for the extension of the sewers on to the sewage farm estimates were made for the work on the Monier system, as well as on the departmental design. The result was that the estimate for both works was practically the same. Applying that comparison to this case it would mean that the departmental estimate for the work under consideration would be £22,000." That is a concrete work, is it not? Yes.
- 1403-4. In the original scheme which you prepared for Johnson's Creek and White's Creek the aqueducts were concrete and brick? Yes.
1405. There is a vast difference between Contract No. 77 and Contract 112, as submitted? Not a great deal of difference.
1406. You were supposed to be advising Mr. Young upon the difference between cement composite work and brick, stone, and concrete, as contained in your original plan? Yes.
1407. Then naturally the comparison would have to be made upon similar Government work as applied to the Western sewerage contract? Perhaps I could set this vexed question at rest by giving at once the actual estimates in both cases.
1408. You told Mr. Young that the work would come out at £22,000 in both schemes? Yes.
1409. Presumably the western suburbs sewerage scheme would be a similar work, brick, stone, and concrete, would it not? Not necessarily.
1410. Why not? The difference between brickwork and cement is not very great. There is not so very much difference in cost.
1411. Here is a schedule upon which the contractors are being paid, showing thousands of pounds of difference? I do not know where you get those figures from, but I see from the document that bluestone concrete was put down at £2 10s., and brickwork also at £2 10s. a yard.
1412. In the schedule for the Monier arch in connection with Contract 77 the items are reduced so much that applying the figures of the department in their original scheme for stone, brick, and concrete, there is a reduction from £22,000 to £15,000. There can be no doubt that the comparison you pointed out to Mr. Young would not have brought the cost of the scheme under the Monier principle up to £22,000? What I said to Mr. Young is absolutely correct. In making the designs for the extension of this sewer to the sewage farm I compared the Monier system with the concrete arches, and they came out as I show here to all intents and purposes the same. I applied the same test to the Johnstone's Creek design, and I maintain that I was perfectly right in doing so, although in one case there was brickwork and in the other concrete because the value of brickwork and concrete under these circumstances is practically the same.
1413. Is there any comparison between No. 2 scheme including twelve 18-inch diameter 30 feet long piles, rubble stone packing at top of piles 2 feet deep, &c., and your original scheme for the aqueduct in connection with No. 77 contract? This only applies to the arches. The foundation is common to both. The arch in the one case is to be of concrete, and in the other case of brickwork. As I have already told you the prices for concrete and brickwork were actually the same, that is, £2 10s. a yard for each. I say therefore that the comparison was a perfectly fair and justifiable one.
1414. Are you aware that you had bluestone concrete in the No. 2 scheme for the western sewerage set down at £2 2s., whereas an alteration was made to £2 10s. Would not 8s. a yard over the whole work come to a great sum of money? No. The arches are a very small part of the concrete.
1415. Does the bluestone concrete go through the foundations too? No; that is another class of concrete.
1416. Will you explain your report to Mr. Young since you base it upon No. 2 scheme? I cannot do more than I have done. I have explained exactly how the comparison was made, and I think it was a fair one.
1417. *His Honor.*] I understand that all these three schemes are schemes of construction involving the use of concrete instead of brickwork in the arches—is that so? Yes.
1418. And that the third of them only is the one which is properly describable as the Monier system? Yes.
1419. And that the Monier system as well as the others involves the use of iron ties? All three systems involve the use of iron ties? Not in the arches of No. 1 and No. 2. There it is only in the superstructure.
1420. It is only in the Monier system that iron is used in the arches themselves? Yes.
1421. Is that a peculiarity of the Monier system? Yes.
1422. *Mr. Parkes.*] Is that the only peculiarity? Yes; it is a combination of iron and concrete.
1423. *His Honor.*] It is a system of concrete construction as applied to arches? Yes.

1424. *Mr. Parkes.*] Ahearn's contract for the western sewerage was carried out upon these plans, was it not? Yes.

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1425. And per lineal foot, it ran at about £10 16s. 1d., did it not? No. If calculated for two sewers of 6 feet diameter, Mr. Bagge says it would cost £10 16s. 1d.

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1426. If calculated for three, it would amount to more, would it not? I presume so. As I have said I never could understand this foot-note of Mr. Bagge's. Mr. Davis himself cannot understand it.

1427. If you could not understand it, why did you make use of it in your report to Mr. Young? I never did use it. I used the comparison of the three schemes which have nothing whatsoever to do with that paragraph having reference to John Ahearn's No. 101 contract. I prepared three alternative schemes for the extension to the sewage farm. Nos. 1 and 2 as given in these papers were for concrete arches, not on the Monier system. No. 2 scheme as shown here is estimated to cost £6 16s. 11'3d. per lineal foot. Calculations were made for a scheme giving exactly the same carrying capacity of sewer upon the Monier system which is scheme No. 3 in these papers. That is estimated to cost £6 6s. 8'3d. per lineal foot. You have said that I am comparing two concrete structures, whereas in the case of the Johnstone-street sewer I am comparing a concrete structure with a brick structure, and I say that there is no difference between brick arching and concrete in that case, as they are of the same price. Those are the simple facts.

1428. While brick arching and concrete are put at the same price, the sandstone concrete in the substituted scheme at 2,350 yards is reduced to 1,800 yards, and the bluestone concrete is reduced from 590 yards to 300 yards. The entire brickwork to the extent of 2,020 yards is reduced, all except 150 yards being taken out. Now where is the comparison? First of all I do not know the quantities of which you have spoken are taken from there. I do not know anything about it, or by whom it was done. Mr. Darley will, perhaps, be able to explain it.

1429. I want to know upon what estimate you arrive at the value of the quantities specified in connection with the Monier scheme? On these estimates.

1430. On which? On the No. 2 and No. 3 schemes.

1431. You have not McSweeney's signed contract plans, have you? No.

1432. If Carter, Gummow, & Co., or McSweeney would undertake to reduce the cost of your original scheme by 28½ per cent. upon Contract No. 77, would not that reduction have to be made in respect of the Monier system if the quantities and material were less? Not all through; certainly not.

1433. Why not? Because there is no concrete in that specification. That would apply to the Monier arch concrete, and that is a special composition. Although it is called concrete it is not concrete proper. It is 3 to 1 I think.

1434. *His Honor.*] In the composition is the stone left out? Yes; it is much richer and more expensive.

1435. Is it lighter? The specific gravity would be lighter.

1436. Would it be as tough? Tougher; the more cement you put in the better the concrete. You can have cement 1 to 8. In the Monier arch it is 1 to 3.

1437. The other material being sand? Yes.

1438. You say that the concrete used in the Monier system is a 3 to 1 composition? Yes.

1439. *Mr. Parkes.*] A special bluestone concrete was proposed to be used in your original scheme;—3 of broken metal, 2 of sand, and 1 of cement? That is so.

1440. In your reports to Parliament on 19th December, 1895, you said that this composition would cost from 80s. to 90s.? Yes; £4.

1441. As a matter of fact it is being paid for now at the rate of 70s.? I do not know; the estimate was actually made out on 80s. I did not know that it was being paid on 70s.; if so, it is close to my estimate.

1442. Except the reduction of the other material I have named, and the taking away of the brickwork, the only other change in the Monier arching is in regard to special bluestone concrete, which is altered from 1,000 to 1,050 yards of this composition? All the arch work.

1443. But I mean the only change in solid material other than the arch work? I do not know. I do not know what the quantities are.

1444. *His Honor.*] Do you wish to make any further statement upon the evidence you have given? No, not unless there is anything your Honor does not understand in regard to the comparative estimates.

1445. *Mr. Gummow.*] As to the estimates of 80s. or 90s. for mortar, what does that include? It includes all the net work of iron which comprises the Monier patent.

1446. Do you know, whether as a matter of fact, the 70s. referred to by Mr. Parkes includes the arch? I do not know. I never saw the figures before.

FRIDAY, 5 JUNE, 1896.

Robert Rowan Purdon Hickson, recalled and further examined:—

1447. *His Honor.*] I think you must have been in error, on Wednesday, in some of your answers—I notice that in a minute of the 28th March, 1895, you say, "When plans were being prepared for the extension of the sewers on to the sewerage farm, estimates were made for the work on the Monier system as well as on the Department's design";—beyond Mr. Bagge's report of the 21st September, 1894, which is a sort of comparative estimate of three systems, one of them being the Monier system was any other estimate made showing the relative cost of the Monier or any other system to the original scheme of the Department? Yes.

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1448. What estimate was that? It is shown here in the first and second schemes.

1449. Here we have Mr. Bagge's estimate of the comparative cost of the three schemes which I understand are radically different from any scheme which has hitherto been adopted by the Department? Yes.

1450. I mean, of course, any scheme of sewer aqueduct? Yes.

1451. Beyond that estimate, was any other estimate made by the Department comparing the Monier system in cost with the designs of the Department? Yes; there was the estimate in connection with the Department's design.

1452. What I want to know is whether the estimate made by Mr. Bagge, on 21st September, 1894, was the only one made. I suppose plans accompanied it which compared this system of constructing arches in either concrete or compo. with the Department's former system of constructing arches of brickwork? Yes.

1453.

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5 June, 1896.
1453. But these are the only estimates? Yes.
1454. Upon that comparison you will see that the standard used was Ahearn's outfall sewer Contract 101? No. That is where the mistake comes in.
1455. Is there any difficulty in understanding what Mr. Bagge meant when he says at the commencement of his report, "Three designs are herewith submitted for the consideration of the Engineer-in-Chief, each design with an open aqueduct, carried upon arches and piers. The aqueduct or main carrier is capable of discharging 11,000 cubic feet of sewage per minute, which is equal to two 6-foot diameter outfall sewers running three-quarters full with a gradient of 1 in 2,000." Then, at the end of the report, he says, "Mr. Ahearn's present outfall sewer Contract No. 101, if calculated for two sewers of 6 feet diameter, would cost £10 16s. 1d. per lineal foot." Ahearn's outfall sewer was a contract, I understand, in which there were three pipes of 6 feet diameter each? Yes.
1456. Then, when he says here that Mr. Ahearn's present outfall sewer Contract No. 101, if calculated for two sewers of 6 feet diameter, would cost £10 16s. 1d., it means that he made a reduction below the estimate of the Department for the cost of Ahearn's sewer, assuming that Ahearn's sewer was reduced from three to two carriers. On that basis, although Ahearn's cost would be something more than £10 16s. 1d. per lineal foot, a two-carrier sewer would come to approximately that? Yes; apparently so.
1457. Did you not, when you read Mr. Bagge's report in the first place, understand what he meant as the basis—as the sewer representative of the Department's work already designed—that he meant to take that as the basis of comparison to see how much would be saved if a sewer to carry the equivalent of two 6-foot diameter carriers were substituted for the sewer designed to carry the same quantity of sewage on the principle already in use by the Department? No; it has no application whatever to that. Ahearn's contract was a pipe sewer; the other was an open aqueduct.
1458. But was not the open aqueduct system one which had not hitherto been adopted for sewerage by the Department? No; it was on the sewage farm long before I took charge of the Department.
1459. Before Ahearn's contract was let? Yes; six or seven years ago, before any of the plans of the western suburbs sewerage were in hand.
1460. Do I understand that the principle of open aqueducts carried on a concrete arch had been in use before Mr. Bagge wrote his report? Yes.
1461. On concrete arches? Yes.
1462. Then this system which Mr. Bagge was alluding to in his report was not a new system, except in so far as the Monier arch was concerned? That is so.
1463. What then was the comparison which I understand you wished Mr. Bagge to make when you asked him to write this report? It was as to what would be the cheapest way of extending the sewer into the sewage farm as an open aqueduct; and to arrive at a conclusion he made the three plans which you have here, and gave three estimates in connection with them.
1464. The plans you produce were attached to the estimates, I suppose? Yes. No. 1 scheme is for a concrete arch; not on the Monier principle in any way whatever.
1465. It is constructed, I believe, upon the system of Road-Engineer Koch, is it not? Yes. No. 2 scheme is very much the same. It is a concrete arch also, but with a little difference in the expansion joints, which is a matter of detail. No. 3 scheme is the Monier system pure and simple, but No. 2 scheme is that which we actually carried out in this extension. It is M'Sweeney's contract, No. 112.
1466. Did not M'Sweeney's contract No. 112 involve the use of brick arches? Concrete arches.
1467. Only concrete arches? Yes.
1468. Passing away from that for the present, it is not disputed, I suppose, that the comparison made by Mr. Bagge is correct—that is the comparison with Ahearn's contract No. 101? I hardly understand what he meant, because it was not applicable in any sense. I do not really know why it was brought in. Perhaps he will be able to tell you himself.
1469. When Mr. Bagge made out this report, what particular sewers or extensions had you in contemplation at the time? The extension into the sewage farm, No. 112 contract.
1470. Not anything which was afterwards evolved in Contract No 77? No; as I say, they are two different kinds of work.
1471. At any rate, the comparison which Mr. Bagge makes is, on the face of it, with Ahearn's outfall sewer Contract No. 101 if calculated for two sewers of 6 feet diameter? His comparison between No. 2 and No. 3 schemes is the only comparison which applies to the case.
1472. At all events, Ahearn's scheme was one which did not substantially differ, except in regard to its carrying capacity;—it did not substantially differ I mean from the plans of the Department for Contract No. 77, upon which tenders were called for? That is a different style of thing altogether. Ahearn's contract is for a three-pipe sewer.
1473. But it is carried on brick arches with the concrete which is generally used? Yes.
1474. The pipes I understand are in concrete—they are formed in concrete? Yes.
1475. There is no iron cylinder? No.
1476. It is simply a concrete carrier resting on a brick arch? I ought to explain that what we had under consideration was simply an open carrier.
1477. Is there any substantial difference in cost between Ahearn's contract plans and the plans drawn by the Department for Contract No. 77, so far as Contract No. 77 applies to the building of a closed aqueduct? Ahearn's would be much more costly.
1478. In No. 77 the plans involve not an open aqueduct but an oval carrier? No; I think it is open.
1479. I mean the original plans? Yes; I see it is closed in that case. I thought it was open.
1480. They provide for an oval section instead of a circular section, but that I suppose would make no appreciable difference in cost? Not much difference.
1481. Am I not correct in suggesting this—that the Department's plans for Contract No. 77 and the Department's plans upon which Ahearn worked, although for aqueducts carrying different quantities of sewage, were practically in cost the same, although differing in detail? I should have to go into the matter in detail if I were to reply to that question.
1482. You see they both involve brick arches, which is one radical distinction between them and the other systems? Yes; but the cost of the two would be pretty much the same.
1483. Is there any radical distinction between Contract No. 101 and Contract No. 77, as far as the Department's plans are concerned, in the cost of the aqueduct work? No; I do not suppose there would be very much difference.
- 1484.



1484. Do you not observe that Mr. Bagge has made an estimate which shows that comparing the Monier system with Ahearn's for a similar carrying capacity the Monier system is as 1 to Ahearn's 1·7 in cost—a very substantial difference? I suppose it would be. R. R. P.  
Hickson.
1485. In your letter of 5th April, 1895, you say that the part of Carter, Gummow, & Co.'s tender which applies to the aqueduct work comes out at £9,000, that being the proportionate part? Yes. 5 June, 1896.
1486. That applies to the tender of £15,757? Yes.
1487. Out of the £15,757, £9,000 would be for the aqueduct work on this estimate? Yes.
1488. Reduced 28½ per cent. below your estimate? Yes.
1489. Now, the work they were to do for the £9,000, according to their estimate, was work, I understand, which would cost approximately the same as would work which was involved in Contract No. 101. Your plans for No. 77, on which they tendered, and your plans for No. 101, upon which Ahearn tendered, were practically plans involving the same cost? Yes; very much the same.
1490. They tendered for work which was the same as that which Mr. Bagge has taken into consideration here, which he utilised as a sort of standard upon which to compare the Monier system and the other somewhat similar systems—that is so, is it not? Yes.
1491. Then what I want to know is this—as between the country or the Department and Carter, Gummow, & Co., ought not that sum of £9,000 really to have been divided by 1·7 in order to arrive at the proper reduction which ought to accompany the substitution of the Monier aqueduct for the Department's aqueduct as part of Contract No. 77? Perhaps the best way to answer all this would be to give you the actual estimates of both designs.
1492. What I want to ascertain from you is this: If you reduce the amount of £9,000 in proportion to that reduction of cost which Mr. Bagge mentions in his report you will bring it down to £5,294;—dividing it by 1·7: you will then have a difference of £3,706;—now, is not that a fair calculation in endeavouring to arrive at what ought to have been the difference between Carter, Gummow, & Co.'s tender for the work done upon your plans and their tender for the work to be done upon the Monier system? That is going upon the assumption that £9,000 is really the value of it. As a matter of fact the £9,000 was put high for a special reason, and the calculations we have since had made would show the exact cost of both schemes as applied to No. 77.
1493. At the time you wrote this letter, however, you took the sum of £9,000 as being correct? Yes, as approximately correct.
1494. At the time you advised the Board of Reference you also took the £9,000 as being correct? Yes.
1495. You mention, in fact, the sum of £12,000 as the sum which it would cost the Department to renew that portion of the sewer which was built upon the Monier system? That estimate includes all the taking down which might be involved.
1496. Did it not strike you, having read Mr. Bagge's report which had been made only some six months before, and which you alluded to when you wrote your minute of 28th March, 1895,—did it not strike you to make a calculation to see whether the amount of £15,500 was really a fair tender, being only £257 below the tender made upon the basis of your much more expensive plan? No, it did not, because, as I say, I was comparing No. 2 and No. 3 schemes. As a matter of fact, what has taken place since will show that I was correct.
1497. How does No. 2 scheme come into the issue at all? No. 2 scheme has no relation to the plan of No. 77 contract, inasmuch as No. 2 scheme is founded upon a totally different principle—the principle of an open aqueduct carried upon concrete arches, while No. 77 is a closed sewer carried upon brick arches? The cost of closing a single sewer like that is very light, because you can make your walls so much thinner, and, besides that, there are all the iron braces which go on to the top of the open sewer. These will make it come to nearly the same price as a closed sewer. There is really not very much difference in the cost.
1498. Is there not really a substantial difference between the cost of an elaborate and remarkably strong and good brick arch, such as you see in the Department's design, and the cost either of concrete arches or of composite arches containing iron lattice work? Not very much, because the concrete and the brickwork are at practically the same price.
1499. Then how did Mr. Bagge arrive at the conclusion that the Monier system was very much cheaper than No. 101—that it would actually cost so very much less than your plans as they appear in Contract No. 101? I cannot tell you how he made that out. All I know is that the estimates which we prepared show very little difference in the cost of the two.
1500. At the time the No. 77 plans were prepared I think you said you had had some of this concrete-work done? Yes.
1501. Were you then in your own mind comparing the concrete-work which you had had done with the cost of No. 77, as prepared by you? No; because the concrete-work to which I referred was not done by me at all.
1502. Under whom was it done? Under Mr. Bennett, the late Engineer-in-Chief for Sewerage.
1503. The concrete-work you are speaking of is on an aqueduct leading out to the sewage farm? Yes; from the Botany side.
1504. Then we come back to this, that what you really had as a basis for your calculations and the basis for your report was Mr. Bagge's report? No; what I had in my mind was the comparative estimates made upon the two schemes submitted to me.
1505. The two schemes submitted to you being No. 77 and the Monier scheme? No. The alternative schemes for extending the carriers into the sewage farm according to the plans which I have here.
1506. Those are the plans, I presume, attached to Mr. Bagge's report? Yes.
1507. But they were plans upon which your Department had never worked. You had had no experience of them? Not at that time.
1508. They were new? Well, Contract No. 112 was upon one of these plans.
1509. When was Contract No. 112 carried out? Immediately after this report was made.
1510. Then in working upon Contract No. 112 the quantities were all taken out and estimates were made? Yes.
1511. Then if plan No. 112 did not prove to be very much cheaper than the work you had formerly been doing it could not have tallied with Mr. Bagge's estimate, because, according to his estimate, No. 2 scheme ought to have cost very much less than the brick arch or closed sewer work which had formerly been done by the Department? It would cost considerably less.



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1512. How much less? Well, some of the outfall sewer work was very heavy indeed. I could not say how much it came to per foot, but it would come to considerably over this amount.
1513. But do I understand that when you said the cost of the two schemes would be about the same you were then comparing the Monier with No. 2 scheme in Mr. Bagge's report? Yes; No. 77 was not thought of at that time.
1514. But the No. 77 plans had been prepared? Not when this report of Mr. Bagge's was made.
1515. But when you said that the estimate of both works was practically the same you meant that the estimate for the work done under what we will call scheme No. 2 of Mr. Bagge's report and the Monier scheme were practically the same? Yes.
- 1516-1517. But the plans of No. 77 as designed by the Department were absolutely different—radically different—from No. 2 scheme of Mr. Bagge's report? They were not radically different. There was brickwork in the arches instead of concrete, but you can hardly call that a radical difference, because the cost is practically the same. The sewer in the one case was an open one but it was tied strongly across with iron bars, and, as a matter of fact, we have found from working that the cost of that is almost equal to the cost of filling up with concrete. The difference would be very little indeed.
1518. Then we come back to this—that the cost of scheme No. 2 has been really proved to be the same as the cost of No. 77, as proposed by the Department, and as No. 77 and No. 101 are practically equally expensive then Mr. Bagge must have been utterly wrong when he said that No. 2 would be so very much cheaper than No. 101? When I say that they would cost the same, I mean the same cost per cubic yard. Ahearn's No. 101 Contract is a great deal more substantial, and there is a great deal more material in it than in Contract No. 77, so that per foot run there would be a great difference in cost.
1519. Ahearn's is a more expensive contract because it is a bigger one? I do not mean because it has three carriers, but the work is much more massive in Ahearn's case.
1520. Much more massive than in Contract 77? Yes.
1521. Unnecessarily massive? Yes; unnecessarily massive. By that time we were reducing the massiveness of our sewers. Some of them we found were too heavy. There was a waste of material.
1522. Where would the waste come in in No. 101 in comparison with No. 77? There are enormously heavy foundations and very heavy piers. The arch is a very heavy one, and the body of concrete is much more substantial than in No. 77.
1523. In proportion to the weight to be carried? Yes.
1524. When was the experiment made in the case of the road culvert to which you have referred? I could not tell you the date now, but I could obtain it.
1525. Was it before or after you wrote the minute I have quoted? Before that.
1526. Was it a true Monier arch that was put in in that case with open work? Yes; but not with open work above: that forms no essential part of the Monier system.
1527. It is the introduction of iron lattice work which makes the radical distinction between the Monier and other descriptions of concrete and compo. work? Yes.
1528. *Mr. Parkes.*] I should like to ask whether you let the contract to McSweeney upon the Monier system, or upon the No. 2 scheme reported upon by Mr. Bagge? On the No. 2 scheme.
1529. After McSweeney had tendered for the No. 2 scheme, did you not write to him stating that he must adopt the Monier system and pay 15 per cent. upon the cost? No.
1530. Will you swear that you did not? Yes.
1531. You swear that you did not write to him telling him that he must adopt the Monier system? I did not.
1532. Did you write to him at all concerning the Monier system? He asked me if he would have to pay the patent fees, and I said "Certainly not."
1533. You did not instruct him that although your plan was drawn in accordance with No. 2 scheme reported upon by Mr. Bagge, he must, nevertheless, adopt the Monier system? No.
1534. You did not write to him words to that effect? Certainly not.
1535. You have sworn that the dimensions of No. 101 are greater than the dimensions of No. 77. Will you kindly measure off the dimensions in the plan—take first the piers? In the first place I said that the foundations were heavier and were more costly than were the foundations in No. 77. That, of course, is apparent from the drawing. In the second place you will see that there are very heavy footings in the piers.
1536. What is the width of the piers, as marked upon your plan 101? The footing is here of 11 ft. 6 in. across.
1537. What is the average? You cannot average in a case of this kind; some are 8 ft. and some are 11 ft. 6 in. In the plan of No. 77 there is one footing which is 10 ft. and others are 4 ft.
1538. What are the abutments in No. 77? There are some 14 ft.
1539. And your intermediate piers there are 10 ft., are they not? Yes.
1540. What is the width? Seven ft. 10 in. Allowing the same width on the inside of the pipe as on the outside, the pier would be 9 ft. 6 in. in the case of 101.
1541. What is the average depth of the piers from the spring of the arch to the heel of the foundation? Four ft. down to 15 ft.
1542. What is the average depth in the case of plan 77? They run from 4 ft. to 25 ft.; you cannot take an average.
1543. Is it not a fact that the thickness of the piers, as shown by plan 77, is 5 ft. 6 in.? I do not think they would go as much as that.
1544. Are not the piers upon plan 77 greater in carrying capacity than the piers upon plan 101? Not taking the whole of the piers together.
1545. Take the three designs reported upon by Mr. Bagge, of which plans were prepared, was any one of them built? Yes.
1546. Built absolutely from the plan? Almost exactly. The contractors' plans are taken from the plan before you.
1547. Have you had any conversation with Mr. Bagge this morning? No.
1548. Can you produce the plans of the sewer you have mentioned which was built under Mr. Bennett? I should think they would be with the Water and Sewerage Board. I have never seen them.
1549. *His Honor.*] You did not take them into consideration? No; I never saw the work carried out. I only know there are arches in it. 1550.

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1550. *Mr. Parkes.*] Did you not swear that No. 2 scheme reported upon by Mr. Bagge was based upon Mr. Bennett's scheme? No, I did not.
- 1551-2. *His Honor.*] Do you wish to make any explanation upon the questions which have been asked you? I do not know that any explanation is requisite. Of course, I put in the three plans upon which the three schemes mentioned in Mr. Bagge's report were prepared, and upon which three estimates were made out.
1553. I understand you to say in point of fact that Ahearn's plans were wasteful plans;—you mean as to cost, I suppose—the use of a large quantity of unnecessary material? I would not go so far as to say that. No doubt as we went on with our sewerage works we saw where we could save a good deal of material, and we did so.
1554. As between Contract 112, 101, and Contract 77, what you say is that you have effected a substantial saving? Yes, reducing considerably the cost of the work.
1555. Was that done by reducing the co-efficient of strength or by keeping up the co-efficient of strength and reducing unnecessary material? Yes; we found that keeping up a sufficient co-efficient of strength we had a large margin to go upon.
1556. Do you still say that you really did not understand the note appended to Mr. Bagge's report? I did not take it into account at all, because I was comparing two open aqueducts. Why the question of a triplicate closed sewer should be brought in was, to my mind, quite unintelligible.
1557. I understand that No. 2 scheme of Mr. Bagge's report had been worked upon then? No, it was worked upon as the result of the calculations then made.
1558. It had been worked upon before you wrote this minute? Yes.
1559. There was only an interval of six months? Immediately after Mr. Bagge's report had been presented the contract for No. 112 was got into hand on the basis of No. 2 scheme.
1560. And it was in the working out of the quantities that you came to certain results? Yes; the results are shown on plans No. 2 and No. 3, which I have put in.
1561. After arriving at these results the office drew the plans of No. 77? Yes.
1562. In drawing the plans of No. 77 were the plans under scheme No. 2 in Mr. Bagge's report borne in mind in any way? We bore in mind the result of our researches as to the cost of work upon No. 2 scheme.
1563. You had it in mind then that, as between No. 2 scheme in Mr. Bagge's report and No. 77 there was not much difference;—is that so? There was not very much. I have had the estimates all run out accurately since, and I can show you how they come out.
1564. How was it that in No. 77 the office did not go in for another experiment upon the basis of No. 2 scheme, but preferred to adopt the old system? We did not exactly adopt the old system, because in No. 77 we reduced the cost of our work.
1565. I mean so far as the brick arches and the closed carriers are concerned? The brick arches and concrete represent practically no difference in cost.
1566. Was it that you had concluded that brick arches if not connected with unnecessarily expensive work were practically no more expensive than concrete? There was very little difference in cost.
1567. So it was in your mind that only schemes Nos. 2 and 3 were to be compared;—although in fact No. 3, a different system from No. 2, was under comparison, what was really in issue as between the Department and Carter, Gummow, & Co. was a comparison between No. 77 plans and the Monier system in No. 3? Yes.
1568. But you say that in your mind the comparison between the aqueduct work involved in No. 77 and the Monier system were the same as a comparison between scheme No. 2 and the Monier system? Yes.
1569. Because with the increased saving in your designs for aqueducts you had brought down the cost to something practically equivalent to the cost of No. 2? Yes.
1570. Whereas in Ahearn's Contract No. 101 the cost had been much greater than the cost of scheme No. 2? Yes.
1571. That is your explanation? Yes.
1572. Do you understand, then, that Carter, Gummow, & Co. were working on the basis practically of Mr. Bagge's No. 3 estimate in carrying out the work they were to do? On very much the same basis.
1573. That basis brought the cost down to a little less than the cost of No. 2? Yes.
1574. And you looked in the future to being able to reduce the cost still lower by reducing the quantity of material used? Yes.
1575. Very much below the quantity which appears in scheme No. 3? Considerably less. This is not mere theory. I can show you what was actually done. You will see in the book I hand you an illustration of a bridge which has actually been built. The span is 121 ft. 4 in., and the thickness of the crown is only 6½ in., whereas our Monier arch at Johnstone's Creek has a 75-ft. span and is 12 in. thick.
1576. What weight is the bridge to which you are referring calculated to bear? The bridge I have shown you was tested on 14th November, 1890, in the presence of the President of the Zurich Association of Engineers, firstly, by submitting it to an evenly distributed load over one half of the arch, equal to 61 lb. to the square foot, and no measurable deflections could be recorded. It was secondly tested by a moving load of 5 tons being drawn across the bridge, when no vibrations were recorded by the gauges on the loaded or unloaded portions of the bridge, which results were considered satisfactory.
- 1577-8. This was, as a matter of fact, an experiment;—you thought it would involve no serious risk, and that there would be no extra cost, and that although there would be a small saving only at present, it would probably lead in the future to a great saving, because you contemplated reducing the quantities of the material used? Yes. But with regard to what you say as to the risk, there was absolutely no risk at all, because we put the whole responsibility upon the contractors. Most modern engineers believe in this system, and I wanted it introduced without any risk to the Department. Although the saving in this particular structure is practically nothing—that is, only about £200—I am quite satisfied from information which I now have from what has actually been done and from calculations which have been run out, that we shall be able to adopt this style of bridge at a very considerable reduction in the cost of the works.
1579. *Mr. Parkes.*] Why, when the Department was calling for tenders for Contract No. 77, did you not call for tenders upon two schemes—one upon the office plan and the other on the Monier patent? I considered the question, and I came to the conclusion that it would be better not to do so, because calling for tenders upon the Monier principle would be leaving it in the hands of only one firm of contractors to tender.

- R. R. P. Hickson.  
5 June, 1896.
1580. This contract is being paid for on the identical items in your original plan so far as brick archwork is concerned? As I have told you before, I do not know anything about that.
1581. Was not the schedule I now hand you prepared by you? Certainly not.
1582. Were these corrections? Certainly not.
1583. But as regards the printed form? Yes.
1584. In making a comparison between the two schedules—that is, the corrected and the uncorrected one, you see that the printed form is the same? Yes.
1585. Take No. 1;—that is paid for at 2s. per cubic yard? Yes.
1586. The next item is paid for at 7s. per cubic yard? Yes.
1587. And the next at 6s. per cubic yard? Yes.
1588. And the next at 57s. 6d. per cubic yard? Yes.
- 1588½. Take No. 9;—that is paid for at the rate of 20s. per cubic yard? Yes.
1589. Item No. 11 is paid for at the rate of a shilling per cubic yard? Yes.
1590. And item No. 13 at 4s.? Yes.
1591. 14 at 12s.? Yes.
1592. No. 18 at 4s.? Yes.
1593. You see that the two documents compare as to the amounts to be paid for quantities? I see that one item has been changed from £3 to £3 10s.
1594. But the items I have just quoted are not connected with the Monier arch? No.
1595. Therefore they are common to both the Monier scheme and the plan prepared by the office? I do not know. I did not prepare the two schedules.
1596. Are not these the identical items in the original tender form for Contract 77? It speaks for itself; the figures are the same.
1597. Seeing that you received a tender reducing each of these items 28½ per cent., why should they now be paid for at the original office rates? You had better ask the engineer who arranged that.
1598. Did you not prepare this contract? I did not fix these prices.
1599. Did you not advise Mr. Young that he might accept the contract because it would be at the same cost? Yes.
1600. Why did you not report to Mr. Young that 28½ per cent. should be taken off those items which had not to do with the Monier arch? Because I did not think it should be taken off.
1601. But is it not a fair thing, in the interests of the country, when you invited tenders at a certain rate below the office values that it should receive the benefit of those reduced rates? It was a lump sum contract. These figures are used only for progress payments.
1602. The office, in order to pay for this contract, divided it into schedule form? Yes. I did not do that.
1603. You wish to throw all the blame upon Mr. Darley? I do not wish to throw blame upon anyone, but I will not take any blame which does not belong to me.
1604. Had you no correspondence or communications with Mr. Darley as to the fixing of these schedules prior to your advising the Minister? Certainly not.
1605. Have you since that date had any communication or talk with him as to these schedule rates? No; I had not seen this document before the last day I was here.
1606. You cannot tell how that exact sum of £15,500 which tallies so well with this amended quantity list was made up? Certainly not. It is a lump sum without any schedules or rates attached to it at all.
1607. Did you ever wait upon an architect named John Kirkpatrick in order to advocate the use of this Monier system in a building in Moore-street? No.
1608. Did you interview him and ask him to substitute the Monier system for his arches in the building of the Mutual Life Assurance Company of New York? No; I have no recollection of speaking to him on that subject. We have spoken about many professional matters, but I have no recollection of asking him to introduce this Monier patent.

Christian Herman Ohlfsen-Bagge sworn and examined:—

- C. H. Ohlfsen-Bagge.  
5 June, 1896.
1609. *Mr. Parkes.*] You were an engineer in the Public Works Department? Yes; but before I give any evidence, I should like to explain that when I was coming to Sydney last night upon His Honor's subpoena, I was told that I was the instigator of this inquiry. With His Honor's permission, I should like to give that a point blank denial. I am not at all interested in either party, or in either side of the case.
1610. How many years were you in the Department? Fifteen years. I am an engineer of standing in the Colony. I am well known in the profession, and I have carried out various large works.
1611. When you were in the Department you were directly under Mr. Hickson? I was first under Mr. Bennett, and latterly under Mr. Hickson.
1612. Did Mr. Hickson ever request you to make a report on what is called the Monier patent? Yes.
1613. Did he give you verbal instructions, or did you have an interview with him concerning it? Not specially, as far as I can recollect on this subject. Of course we spoke about the matter.
1614. When you made your report you submitted three plans? Yes; three plans were sent in, but they were not all drawn under my direction—that is to say, the plan for the Monier scheme was not.
1615. Who did that? A gentleman in the office named Baltzer.
1616. Was he not one of the holders of the patent? Yes; I recollect now that Mr. Hickson instructed me at the time to be modern in my designs, and we then prepared several designs on the latest principles. One of these was a concrete arch which had been recently constructed in Germany and which was considered a novelty.
1617. That was No. 2 scheme, mentioned in your report? Yes.
1618. Did you base your design in that scheme upon any work in the Colony? No.
1619. Did you tell Mr. Hickson that you based it upon Road-Inspector Koch's design? Yes, I think so. He was the man who built the works at home.
1620. You based your design upon his work? Not exactly; because his bridge was simply a road bridge, while our bridge carries an aqueduct. I ought to explain that on the continent when professional men bring forward anything which is apparently new the Government will not entertain any patent. They do not exactly put their foot down upon it, but they say, "you must form a strong company and

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and give us sufficient security." I may tell you that the Government in Germany forced the cement manufacturers to form a union, and it was only from this union that these arches would be allowed to be constructed.

1621. Did you compare your quantities for these three different schemes with John Ahearn's work only? No—yes, I think we did.

1622. You did not make any comparison with a sewer running through Botany? No; I think we compared only with Ahearn's contract.

1623. Did you have any conversation with Mr. Hickson concerning any Botany sewer? I do not think so. I cannot remember it.

1624. What is your opinion of the saving which would be effected as between the original office plans and the proposed plans on the Monier system? I can scarcely recollect what the saving is. I think the report states it.

1625. The report embodied your opinion upon that point? Yes.

1626. And the intention of the report was to convey that opinion distinctly to Mr. Hickson? Yes.

1627. Did he understand it? I think so.

1628. You were in the office when M'Sweeney's Contract No. 112 was started? Yes.

1629. Were any of these schemes adopted for M'Sweeney's job? I do not exactly recollect the transaction, because when the plan leaves me and the tender is accepted the matter does not go through my hands.

1630. *His Honor.*] What is your recollection of what took place? I think one of the designs was adopted, but unless I saw the plans I could not say.

1631. *Mr. Parkes.*] If you saw the plans of M'Sweeney's contract you could tell? Yes. There was such a lot of work going through my hands that, of course, I am liable to get mixed up concerning the different plans.

1632. On 14th March, 1894, the tenders for Contract 77, at Annandale, would be in your hands? I suppose so.

1633. The original document before you is your report is it not? Yes.

1634. At the end of your report you say, "I think it would not be advisable to construct at the outset a work of such importance on the Monier principle"? Exactly.

1635. It was your opinion that it would not be safe to construct the work upon a risky patent? Exactly.

1636. Do you know how the lump sum of £15,500 was made up;—was any schedule produced? I never saw it to my knowledge. I was only informed unofficially that the design had been accepted.

1637. Was any schedule made up in the office do you know? We made no schedule up, I am sure of that.

1638. If any contractor tendered 28½ per cent. below the original office schedule prices, do you not think it would have been proper to take that 28½ per cent. off the schedule in the case of the Monier scheme? As far as I can recollect, the Monier scheme was a special offer from the contractors to the Government. They tendered for our work, and handed in at the same time a design of the Monier principle.

1638½. Will you look down the altered quantities in the document I hand you? Yes.

1639. If you had known that the quantities of the Monier would be so much reduced upon the original design quantities you would have recommended that it be not adopted, except at the reduced prices? I could not honestly have done so. I would have recommended the department not to try the Monier system.

1640. Did you ever observe closely the substituted plans for Contract 77 on the Monier system? I think I have seen them.

1641. Who prepared the plans? Mr. Baltzer.

1642. Was he in the office then? Yes.

1643. Did you pay any very close attention to the plans? I did not. I informed Baltzer that Mr. Hickson wanted a Monier design. I said, "Now, Baltzer, here is your chance. Mr. Hickson wants a Monier design. You, as an expert, can draw it." He replied: "Yes, Mr. Hickson has told me so."

1644. In the light of your engineering knowledge, do you not think that there would be considerable saving in the Monier as compared with the office design? That is a very questionable thing. You must not forget that the Monier system has to be carried out entirely by experts, and it has to be proved whether the experts we have in the Colony will be successful in carrying it out. I sincerely hope they may be. I hope for the sake of all concerned it may turn out to be a success. I could not say at present whether there would be a saving on the design or not. Perhaps I ought to tell you that the Monier system was first started in France.

1645. On what date? I think the office has known the Monier system since 1888. It was started in France; then a German engineering firm went to France and made arrangements with the Monier Company to sell them the patent, and to give them all the necessary information so that they might start works upon the principle in Germany. Another firm took out the patent in Austria. There were thus the three patents in existence. The German Government, when they were approached with reference to the building of works upon the principle, said, "We cannot introduce any work in the nature of a patent. If we did so, it would create a monopoly, and we cannot do that. We will not exactly put our foot down upon it, but we must have very substantial sureties concerning it. A strong company must be formed, and they must take all the responsibility. We, as a Government, cannot do any more in the matter." The Governments of France, Germany, and Austria would not adopt the patent. They thought it impracticable to carry it out by the ordinary builders and contractors, and that being so, I did not think I was justified in leading the Government of this Colony into what, according to the best knowledge I could obtain from home upon the subject, might have been endless trouble. I do not think we were justified in assuming that we had specialists here who would be prepared to carry out works on the principle.

1646. What is your opinion of the arch, supposing the iron grill were not in it? If the iron were not in it the Monier arch would tumble down.

1647. You notice that according to the plan in this case it would be exposed to the weather? Yes.

1648. There is great porosity in concrete? Yes.

1649. And in rainy weather it would become soaked with water, would it not? From what I have been able to read of the latest news from home concerning this system, it has been very highly spoken of by the institutes of civil engineers in Germany, Austria, and France. It has been discovered that the cohesion between the concrete and the iron is so great as to create a force enabling the patentees to use the system very generally.

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1650. Is it not much cheaper? That is another question. It would be lighter, and it might in some instances be cheaper; but if that result is to be obtained all the cement used must be of equal strength, and we cannot guarantee that in respect of the cement we have to use here. Speaking of my fifteen years experience in the Sewerage Department, I am in a position to say that the home manufacturers try to "do us" continually in the matter of cement. We had to make constant endeavours to counteract the effects of using bad cement. You can understand a great risk under such circumstances attending the adoption of the Monier principle.

1651. Of what thickness would the iron be in these arches? It would be only  $\frac{1}{4}$  inch iron.

1652. If the iron were wet for any period would not the rust affect the rods? No; I think not. It has been estimated that the concrete adheres to the iron with a force equivalent to from 400 to 500 lb. to the square inch.

1653. Iron inserted in stone or in concrete has been known by rusting to break the stone or concrete to pieces, has it not? It may have done so in stone where it has not been surrounded by concrete; but when clean iron is put into cement, when all the rust is first taken off, then the cohesion of which I have spoken sets in, and that constitutes the immense strength to be found in the Monier system.

1654. *His Honor.*] Supposing any damp got through the concrete,—would the presence of the cement in immediate contact with the iron stop oxidation? If you use the best quality of cement it would set instantaneously on to clean iron, and you have then produced an immensely strong structure in which you will not have to contend with oxidisation.

1655. Supposing the bond to be perfect, but supposing also that moisture does slowly percolate through the cement, has experience shown that in such a case the iron oxidises at any rate, or does the opposite result ensue—does the iron remain unoxidised? If the iron oxidised it would prove, in my opinion, that the cement was not good.

1656. You think then that the moisture would not get through good cement? I think not. I believe the Monier people are constructing water-pipes of the same material.

1657. *Mr. Parkes.*] Will not a 3 to 1 compo. absorb water? I should think so. The plans which I have seen from Europe do not carry an aqueduct. In this instance it is intended that an aqueduct should be carried. Not only is there that difference between the two cases, but you have here a very severe climate. You have immense heat on one side and comparative coolness on the other side of the structure, and what effect those conditions will have upon such a structure as the Monier arch it is difficult to fortell.

1658. Will you look at the section and tell me what size are the bolts which tie the side plates of the sewer channel? They are three-eighths bolts.

1659. A very small bolt? Yes.

1660. How far is it from the bottom of the invert of the sewer to the bolts you are looking at? Only about an inch or two.

1661. Is the lining of the sewer cement? It is cemented when the work is finished.

1662. Would not the damp, from the constant running of the sewer, rust away the iron bolts? Not if the cement is good.

1663. It all depends upon the adhesion of the cement to the iron? Yes.

1664. Have you never seen iron bolts or hooks taken out of cement because they have rusted away? If so, I should say they were put in dirty.

1665. You think everything depends upon the iron rods being put into the cement thoroughly clean? Yes; and on the cement being thoroughly good.

1666. Do you not think the Monier system is a most risky structure in comparison with a plain brick arch, with stone abutments, and with concrete? I have said already that I do not conscientiously think we have specialists here who could undertake work of this kind. I know how the thing originated in the office. Mr. Baltzer claimed to be a specialist. In speaking to him about the matter, I said "You are not a specialist. You have merely received an advertising pamphlet from your brother, who is a schoolmaster in Europe. Upon this pamphlet you have taken a patent. If you were asked to calculate the strength you would not know how to do so. You are a clever young fellow and you have not long left the University. You are a clever man in many respects, but you have not had that practical experience in these matters which would entitle you to call yourself a specialist."

1667. What is the width of the arches as shown on the plan from centre to centre? 82 feet 10 inches.

1668. Now, will you look at the original plan and tell us the distance between the centres of the arches? 52 ft. 3 in.

1669. *His Honor.*] Do you mean from centre to centre, or are you taking the span? The span.

1670. *Mr. Parkes.*] Will you tell us how many extra piers are needed for the construction of the office design as compared with the Monier scheme? There are twenty piers in the office plan and fifteen in the Monier scheme.

1671. Does not that make a considerable saving on the Monier patent? It may; it depends upon the result.

1672. I am referring to the saving in the cost of construction as between the two plans? It is very difficult to say what the saving would be.

1673. There is less material, is there not? Yes; but there is a great difference in the quality of the material.

1674. Does not the patent consist only in the change in the arch? It consists of many things. Its success will certainly depend upon getting special cement. In constructing an arch upon the Monier system it is necessary to start at both ends and not to leave off until the arch is finished. The work must be carried on night and day until it is completed. No dry joints must be left.

1675. Have you had a look at the work at Annandale since it was started? Only from below.

1676. Did you notice whether the arches were being built in the manner you have described? I did not go there for the purpose of inspecting them.

1677. Are they building them in the manner you have described? I could not tell.

1678. Are they not building them arch by arch? I think they are.

1679-80. *Mr. Gummow.*] I understand you to say that the arches must be built altogether;—what do you mean by that? What I mean to say is that you have to start a number of arches at the same time. You also have to start the cement work from both ends of each arch simultaneously. The work must continue until it is closed in the centre. It must go on night and day. It will not do to have any dry joints. There must be no joint in any part of the structure.

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1681. What is the effect of building one arch *in toto* to-day and building another arch *in toto* to-morrow? Supposing you build one arch to-day the pier is not built to resist the thrust of the adjoining arch; it is simply built in conjunction with all the other piers to hold the top structure. If you are going to construct arch by arch you must run the risk of toppling a pier over, or causing a crack in the structure. 1682-3. *His Honor.*] But is there any appreciable thrust before the centerings are taken out? The moment the centerings are taken away the thrust is there.

1684. But I understand that the centerings are left in the Monier system for some months after the entire work is finished? Yes; so they should.

1685. And when the centerings are in there is no thrust? You cannot tell; it is difficult to say. The secret of the Monier system, speaking from what I have read—and I can only speak from what I have read—is this, that you must have a number of arches commenced at the same time from each abutment, the whole structure going gradually forward and preventing the leaving of any dry joint.

1686. If you built one arch and completed it, and afterwards started another arch and completed that, a dry joint would be left between the two arches, that is to say, one part of the material would be dry before the other material was applied to the adjoining arch? Yes.

1687. There is a joint in this system at the centre of each pier, I understand, and that is filled in with another different material? That is another German system.

1688. The Monier system does not involve these joints? No. It is one continuous structure. It is upon much the same principle as the Americans build their big "sky-rakers." They are built of steel lattice-work, and this is enclosed in concrete. There is a great difficulty in getting work of this kind done from one end to the other honestly and conscientiously.

1689. *Mr. Gummow.*] If one arch is built and completed to-day, and another arch is completed say to-morrow, you say that that would be dangerous to the stability of the structure? It might be.

1690. If the centerings are left in? I am not prepared to say. It might be.

1691. In calculating the amount of thrust upon the piers, is not the whole calculation taken out with the weight of the carriers—with the weight of the sewage in them—and not upon the arch alone? That is quite right; but if you build arch by arch you get dry joints, and one of the difficulties of the Monier system is to avoid those joints.

1692. In the case of the arches, which are being built in Contract 77, is no joint provided for in the whole length of them? The work should be continuous.

1693. *His Honor.*] I understand that No. 3 scheme is held by you to be an improvement upon the Monier system? Yes.

1694. *Mr. Gummow.*] Will you look at the plan of Contract No. 77;—is there no expansion and contraction joint shown upon it? None are shown as far as I can see.

1695. Supposing the arch to be built, and the centering to be removed, is it possible to calculate whether the pier would be sufficiently strong as an abutment to resist the thrust? It is difficult to calculate; I think it was specified that not less than five or six centerings should be used at a time.

1696. Why? So that when one set of arches was completed the centering might be taken out and put in others.

1697. Do the centerings act in such a way as to take away the danger of thrust in the case of any particular arch? Decidedly, if the centerings were put in carefully they would do so.

1698. You have been down to the contract at Annandale? I have been there once or twice; I was there on other business.

1699. As a matter of fact, did you not go over and have a look at it with young Mr. Hickson? I was there with young Mr. Hickson; I looked at the work from down below.

1700. Did you notice at the time whether the arches had centerings in them? I did not take much notice.

1701. *His Honor.*] Are you certain whether any of the arches which you saw was standing without its centering in it? I could not say; I did not go there for the purpose of inspecting the work.

1702. *Mr. Gummow.*] Did you not, in the course of your evidence to-day, say that the arches would tumble down if they had not the ironwork in them? I should think so; the Monier arches would tumble down.

1703. Then what is the meaning of this paragraph in your report: "In order to meet this difficulty, the radius of the 75-ft. span arch of scheme No. 3 had to be so selected that the centre line of forces should always keep within the middle third of the arch ring";—would that arch tumble down if that were done? Yes, it might.

1704. If the centre line of forces were kept within the middle third of the arch ring? The centre line of resistance in the Monier arch did not, in this case, keep within the thickness of the arch, so we had to draw it thicker.

1705. Do you know whether the centre line of resistance will keep within the middle third of the arch ring? We tried to make a calculation, but the key was not given us, and we could not arrive at any conclusion which would warrant us in saying that it was absolutely correct.

1706. Then what do you mean by the paragraph of your report which I have just read? Well, I was just saying that we tried to make a calculation and could not do so.

1707. *His Honor.*] The paragraph which Mr. Gummow has read has reference to your own scheme, I take it, which is said to be an improvement upon the Monier system? Yes.

1708. *Mr. Gummow.*] Were you able, in making these improvements, to calculate that the centre line of resistance would keep within the middle third of the arch ring;—you could not calculate that in reference to an arch of this kind designed by someone else, could you? We tried to do so, but we found that the key of the calculation was not given. Mr. Baltzer said he could easily calculate it. We got at a result in a roundabout way, but we could not guarantee it.

1709. *His Honor.*] Is the plan of the third scheme before you the drawing which you sent into Mr. Hickson with your report? This is apparently a tracing of the plan drawn by Mr. Baltzer; I could not accept any responsibility in connection with it.

1710. The tracing before us would be made from Mr. Baltzer's design? I presume so.

1711. The original plan would contain the same writing on the top of it? I should think so.

1712. This plan is not the original which you sent to Mr. Hickson with your report concerning the three different schemes? I cannot say.

1713. *Mr. Gummow.*] In face of your statement to-day that if the iron were not in the arch it would tumble down, you will see from the plan that the arch is made thicker, and you so calculated your radius that the centre line of force was to be kept within the middle third of the arch ring. Under those conditions



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conditions is it likely that the arch would break down? That is the question. Of course the arch has been made thicker as you say, but we cannot guarantee the calculation.

1714. *His Honor.*] In making these calculations did you take into consideration the effect of the iron generally, or did you take that out of the calculation? We had to leave that out of the calculation. We had not the formula to connect the two things together.

1715. When you had your co-efficient of stability, you calculated it upon the assumption that the arch was built of compo only? Yes.

1716. The iron came in as an extra? Yes.

1717. *Mr. Gummow.*] In your third design, then, you calculated that the arch would stand if built without iron? We had orders to save money as much as possible. The thing was done according to instructions. As I have told you we were not sure of our calculations being right. We had to get at the result in a roundabout way as nearly as we could.

1718. You say you calculated this particular curve and thickness so that the centre line of forces would always keep within the middle third of the arch ring;—what I want to know is would the arch stand if the line of forces were kept within the middle third? Yes, it would stand provided it is thick enough.

1719. You calculated your third scheme in accordance with that? Yes.

1720. If this particular work were designed in the same way would it stand? I should think so if it were carried out as required.

1721. It would stand without the iron? It would stand, according to our calculations.

1722. I thought you said that without the iron the thing would fall down? What I have been endeavouring to point out is that there is a great risk attaching to this style of structure unless carried out by specialists.

1723. *His Honor.*] Does it not come to this—that if it were not for Monier accidentally discovering that the introduction of iron network or bars into a concrete or cement structure made it enormously stronger you would not have thought of building a structure of this kind at all. Although your calculations show a factor of safety of 5.618, still you would not have trusted to that. Does it not come to this—that you, as an engineer, do not yet know enough of the system to be able to calculate how much the structure is strengthened by the introduction of the iron grill? That is just what it comes to.

1724. *Mr. Gummow.*] Is it not possible for a calculation to be made in such a way as to afford a guarantee that the arch will not fall down? We did make a calculation as far as we could, and you have the result.

1725. Is compo. weaker than concrete? It depends altogether upon what mixture you take.

1726. *His Honor.*] From the point of view of toughness, not upon the crushing resistance only, but taking the breaking strain? The concrete is more solid.

1727. You say that concrete is a more solid mass than compo.? Yes.

1728. *Mr. Gummow.*] Are your calculations in respect of scheme No. 3 taken out in compo. or concrete? They must have been taken out from these plans. The Monier arch is of compo.

1729. Then you are satisfied now that the arch would not fall down if there were no iron in it? According to our calculations it would not; but I am not certain that it would stand.

1730. What is the size and number of the piers in this scheme as compared with the original scheme No. 77? They are in the proportion of fifteen to twenty, I think.

1731. What is the size of the piers? In the substituted Monier scheme they are 7 ft. 10 in. by 13, as compared with 4 ft. 3 in. by 6 feet in the original plan.

1732. You say that you require to use good cement? Yes.

1733. Did you have tests made of the cement when you were in the Department? Yes.

1734. You tested every shipment or parcel which came in? Yes.

1735. Would not that test show you whether the cement was good or not? That is very questionable, because we have found in one shipment different cements. Then, again, one shipment would not be the same as another. There is great difficulty in getting good cement.

1736. How do they manage to get an equal cement on the continent if you cannot get it here;—why cannot you test your cement here in such a way as to insure an equal quality? They do not send the best cement here. On the continent the whole of the cement manufactured has to go through the State's testing machine. You specify there for State cement. The cement would be sent from Berlin, for instance, in sealed waggons and casks, and one cask is just the same as another.

1737. Do they test every cask? The whole of the cement is tested.

1738. Does not the Sewerage Department test the cement, taking a test out of every fifty casks;—do they not go into elaborate tests to prove the consistency of the results of the tests—for instance, if you take out a test here and there out of every fifty casks in a shed, and if the tests go to show that the cement in itself is good and that it is consistent, what more do you require; is not that satisfactory? I do not think so. In the case of some works we have tested the cement and in some shipments we have found two different kinds of cement with exactly the same label. I am not now speaking of your firm. I am speaking generally of the trouble which we have had in connection with cement. By some extraordinary manipulation two different kinds of cement have been mixed together under one brand. That illustrates the great risk that you run in adopting these modern structures which depend upon an equal quality in the cement. Upon the continent you have a different condition of affairs because the State guarantees the cement, but here you have to deal with cement which you obtain from the market, and the dealers will do you if they can.

1739. But if the cement is put into bond and the Government tests it as they do here, and we get it out of bond, is not the cement practically as much guaranteed by the State as it is on the continent? Certainly not. I would not trust the tests here for more than the casks actually tested.

1740. But is it not practically a State test which is made here? I would not guarantee one cask apart from another.

1741. Do you know how an iron and cement structure would expand or contract? The materials counteract each other; the combination has been very highly spoken of on the continent.

1742. In this particular instance the iron network has simply been adopted as an additional security? I told you that we had not the key in making our calculations, and that is why we made the arch so thick, that it would hold itself without the iron. Theoretically it is so, but I am not sure of the result.

1743. You calculated the arch without the iron? Yes.

1744. You say in your report the wrought-iron network was mainly to be laid in as additional security? Yes.

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1745. You have nothing against our firm? No.
1746. Have you not often said that you would not like to see the Monier system used by any contractors, but that if it were to be tried by any firm you would be quite satisfied we should give it a trial? I believe honestly that if any firm here would give it a fair trial it would be your firm. I would entrust your firm with this experiment before any other.
1747. So satisfied are you with our work? Yes.
1748. You said that Mr. Hickson told you to be more modern in your ideas? Yes.
1749. But he gave you no clue whatever as to the formula to be adopted in this case? No; all that we had to go by was the description in pamphlets.
1750. Are there such things as formulas in connection with the Monier system? Yes.
1751. Do you know of any persons in the Colony who have them? No.
1752. When you were asked to be more modern in your ideas, you were not, as a matter of fact, in touch with modern formulas? We used to get the latest information from Home every year.
1753. Is it likely that the patentees would let you know all their formulas, and give them to you? Certainly not.
1754. Do you think they would give or sell them to anyone? I doubt it.
1755. Are you satisfied that no oxidation sets in when iron is bedded in cement? The iron may oxidise, but, as I have pointed out to you, the secret of the system consists in the cohesion existing between the cement and the iron.
1756. *His Honor.*] As to the question of oxidation, you cannot possibly say whether, in course of time, by very slow action, the whole of the bars of iron might not get oxidised right through? From what I have read of the criticisms of the German Institution of Civil Engineers that would not be likely to take place. The secret of the system lies in the extraordinary cohesion between the iron and the cement. The German Government do not adopt this system. They simply say to the patentees, "If you are going to carry out this patent in such and such a work you must put down 75 per cent. of the value in cash securities. After the work has stood one year 50 per cent. of the contract money will be paid you. After it has stood for the second year another 25 per cent. will be paid you. After it has stood for the third year you will get the balance with your security." You will see from that that the State thinks there is some risk in the system.
1757. Once the iron is oxidised through of course its effect upon the structure is lost? Yes.
1758. With regard to expansion and contraction experience I believe shows that the expansion of the iron with an increase of temperature does not crack the cement? It does not. The chief danger I saw in this instance was this—that I had seen the system applied only to bridges, not to an aqueduct above it.
1759. Is not the presence of running water in relation to the changes of temperature one of the best elements there could possibly be;—is it not likely really to keep the temperature from changing very much;—would not the changes be likely to be less than if the running water were not there? True; but you must not forget that the sewers do not always run full. They will be running during the daytime at different heights of flow. At certain times you will see a small rivulet at the bottom. At other times you will see a foot or two, and at other times they will be brim full. Between these times the structure is exposed to the varying temperature of our climate, and the constant changes in the depth of the water are a severe test to the channel.
1760. But that is not so bad as in Central Europe so far as maximum and minimum changes are concerned? At all events the Governments of Central Europe will not accept it as a system for general structure, and I am afraid that if it is adopted here generally we shall one day have to pay the piper.
1761. *Mr. Gummow.*] What do you mean by its adoption in general structure? I mean that the Governments do not generally adopt the system in constructing public works.
1762. Do they not use it generally in bridge work? No; the Continental States will not do so.
1763. But do not the States there allow it to be used? No; except under the conditions I have named.
1764. Do they not allow it to be used for road bridges, railway bridges, and overhead bridges? Only under the conditions I have stated.
1765. But it has been allowed to be used? In certain places, but not generally.
1766. *Mr. Parkes.*] When you came into this room this morning you said you had been accused of putting away the Department? I do not wish to mention any names, but I heard so. I was highly astonished.
1767. Did you ever speak to me before to-day? I think some fifteen years ago.

MONDAY, 8 JUNE, 1896.

Robert Rowan Purden Hickson recalled and further examined:—

1768. *His Honor.*] I want you to explain exactly under what circumstances, when, and for what reason the change was made in the system of calling for tenders—you understand the change I mean? Yes. The contractors had been in the habit of what is called rigging their tenders—that is to say, they made an estimate of what they thought there would be an increase upon, and *vice versa*, and arranged their prices accordingly. That is the system which formerly was adopted, and which is still adopted in this Colony, with the exception of works in the Harbours and Rivers Branch and the Sewerage Construction Branch. I saw that this would lead to difficulties in ascertaining the actual cost of the work, and I altered the system to one under which the Department fixes the prices, and allows the contractors to tender at the rates named, or at a percentage above or below them.
1769. Do you remember the date of that change? I could not say, speaking from memory, the date of the first contract let under the altered system.
1770. Was this change made by the Minister upon your suggestion, or what was done;—how was the new departure evidenced? I made the change myself.
1771. Was there anything in the form of a new rule which appears in writing anywhere in the Department? There was nothing in writing. I made the change myself upon the first contract after I had decided that a change would be advisable. I could not tell you the exact date, speaking from memory.
1772. Did you make the change after consultation with the Minister, or was it your own idea entirely? I made the change after consultation with the supervising engineer, not the Minister.
1773. It was not necessary you thought to consult the Minister? No.

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1774.

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1774. Had you in your mind at the time you made the change any special instances of obviously absurd prices which had appeared in tenders which had been sent in? Yes; I had a good many prices in my mind at the time.
1775. Were there any more absurd on the face of them than a penny per yard in the case of the subducts, or £50 for a square yard of bluestone pitching—I mean the prices given in respect of Contract 69? A penny per yard was not an absurd price for the subducts.
1776. Certain subducts were to be built according to the specification of the office, and they were tendered for at 1d. per yard; would not that be an absurd price? That is not the whole price of the subducts. There is a charge under other items, irrespective of the 1d. per yard.
1777. Will you explain them? The subducts would also have to be paid for under the heading of excavations at 27s. 6d. per yard.
1778. What other items would come in in connection with the payment of these subducts? There would be hand-packing, but that is a small item. Practically, excavations would be the only other item.
1779. Then what does the price tendered for subducts actually cover? The pipes.
1780. And the packing round the pipes? No; the packing round the pipes would be charged for under the heading of hand-packing.
1781. Then the 1d. per yard would be for the pipes only? Yes.
1782. But the pipes would be worth a great deal more than 1d. per yard, would they not? Yes; but the whole price of the subducts would come to about 12s. 2d., instead of 1d. per lineal yard for a 6-inch pipe, and that is a fair price.
1783. That would be for the whole thing? Yes.
1784. Including the excavations? Yes.
1785. The contractor, if he tenders at 1d. per yard, is paid for the excavation, is he? Yes.
1786. In addition to whatever price he may tender at for the subducts? Yes.
1787. What would be a fair price to allow for the value of the pipes? I suppose 6d. per foot would be about the value of them.
1788. I notice that in this case the other contractors tendered at a very great advance—I forget now what it amounts to? Yes; but their price for excavations is low, so that the ultimate price for the subducts does not vary so very much.
1789. With regard to the other price I mentioned, £50 a square yard for bluestone pitching, that is ridiculous? It is absurd.
1790. Was that one of the items you had in your mind when you altered the system of tendering? Yes.
1791. It was not so much the subducts then which struck you as being an absurd item as the other item I have mentioned? Yes, so far as this particular contract is concerned. But, of course, there were other contracts where the same thing would come in to a greater or less degree. There was the adjoining contract of Carson. Timber piles were put down at 5s. The value of them would be about 3s. It turned out that a great quantity of them were required, so there was a big profit on that item. Then there were other items which were absurdly low. For instance, in the contract we are now dealing with the timbering was also put down at 1d. per cubic foot. I presume the contractor thought that probably there would be very little of it.
1792. What would be a fair thing per cubic foot? About 2s. 6d.
1793. I understand that the system proved to be very unsatisfactory going right through the various contracts? Yes.
1794. And for that reason—that it left an opportunity for pointing—you considered it advisable to change it? Yes. I may mention that in the case to which I alluded just now the contractors made a very bad hit. In the case of the timbering put down at 1d., the estimated quantity was 9 cubic feet, and I see by the final voucher that the contractors were paid for 9,918 feet.
1795. So that they made a considerable loss upon that item? Yes. I suppose they lost about £900.
1796. You concluded, therefore, that the fairest plan would be to take off an estimate of each item, and to let the contractors tender at, above, or below it at a fixed ratio? Yes. I think that is the proper way to do the work, though of course none of the contractors liked the change.
1797. It was a new idea so far as your experience goes;—it had not been adopted in the other Colonies? I do not know of any place where it had been adopted before. As a matter of fact, I know that it is not adopted in the Railway Department in this Colony.

Justin McSweeney sworn and examined:—

- J. McSweeney.  
8 June, 1896.
1798. What is your occupation? I am a contractor.
1799. You have carried out various contracts for the Department of Public Works? Yes.
1800. You carried out a contract at what is called the sewage farm—I mean Contract No. 112—did you not? I am doing it now.
1801. What is the contract price for that work? It is at schedule prices. I think it runs somewhere between £17,000 and £20,000.
1802. When tenders were called for that work, did Messrs. Carter, Gummow, & Co. tender? It is very likely they did, but I am not sure. I think Carson was the next tenderer to myself.
1803. Did Messrs. Carter, Gummow, & Co. not put in a tender on the Monier system? They may have done so. I do not know any of the particulars of that system.
1804. After you had signed your contract, was any approach made to you by the officers of the Department with the idea of your substituting the Monier system for the original plans? No communication was made to me by the Department, but previous to the acceptance of the contract I received a letter in relation to the Monier system. It was not, however, from the Department.
1805. From whom was it? Messrs. Carter, Gummow, & Co.
1806. *His Honor.*] Have you that letter;—what have you done with it? I probably gave it to one of my clerks.
1807. *Mr. Parkes.*] Will you have it sent to His Honor if you still have it? Yes; Mr. Strong, who is in my office, will have it if anyone has it, and he could produce it at once.
1808. On about what date did you receive the letter? I cannot say; but I received it before signing the contract.

1809. What was the purport of the letter? They said they would expect me to pay them a royalty of 15 per cent. for the use of some of the Monier plates which were specified in the contract. There were some Monier plates specified as part of the contract just at the discharge. There were some small arches there, and that is where the Monier plates were to be used. J. McSweeney. 8 June, 1896.

1810. Did you communicate with the office? The first thing I did was to answer Messrs. Carter, Gummow, & Co.'s letter. I said I had taken the contract from the Government plans, and that I intended to carry out those plans. I also said I did not look upon their claim as tenable, and that if they wanted to enforce it they would have to go to the Supreme Court, or something to that effect. I am not quite sure of the words I used.

1811. Did you appeal to the officers of the Department? I saw Mr. Hickson, and told him I had received this letter, and that I would not pay the amount. I said I should resist it, and he said, "If there is going to be any trouble about it I will strike the bars out." There were to be only a few Monier arches. They would be of no benefit to the work, and I could not see why I should be called upon to pay a royalty of 15 per cent.

1812. What would have been the total amount you would have had to pay? If the 15 per cent. applied to the whole contract I should have had to pay that percentage on about £17,000.

1813. Did they make their demand in respect of the whole contract? The impression upon my mind is that their claim applied to the whole contract, but I am not sure upon that point.

1814. Did Mr. Hickson make any effort to persuade you to use the Monier system? No.

1815. Then you did not use the Monier plates? Shortly afterwards the work passed into the hands of Mr. Darley, and he revised the whole of the plans. He made general alterations in them which benefited the work. I also called his attention to the matter of the Monier plates, and I told him that if there was going to be any claim against me it would have to end in a lawsuit. He subsequently struck them all out, and substituted ordinary brick arches.

1816. You were certainly under the impression that the Monier plates were put in with the object of Carter, Gummow, & Co., obtaining a 15 per cent. royalty from you? When I tendered for the contract I took very little notice of the plates. It was only when I received their letter that my attention was directed specifically to the matter.

1817. Was their letter received by you before you signed the contract? Yes.

1818. Were the Monier plates taken out by Mr. Hickson before you signed it? As I have already explained to you when I received Carter, Gummow, & Co.'s letter I said I would carry out the plans of the Department, and that I would take all the consequences. I told them that if they claimed anything they would have to go to court for it.

1819. But it was not until the work came under Mr. Darley that the Monier plates were struck out? That is so.

1820. You complained to Mr. Darley before they were struck out? Yes. I said that if Messrs. Carter, Gummow, & Co. enforced their claim it would end in a law suit.

1821. If you had had an opportunity to carry out the Monier system in connection with the Annandale contract, No. 77, would you not have done so? I never saw plans of the Monier system. I do not know what it is.

1822. Supposing the quantities under the Monier system were reduced considerably below the quantities in the original plan, would you have wanted any more as your payment for the job than the prices under your 25½ per cent. reduction—I mean the prices at which you originally undertook to construct the work? Provided the concrete were mixed in the same proportions, the price would be the same.

1823. As a practical man, would you not sooner construct a work of three to 1 composition than of special bluestone concrete? I should have to go into that matter carefully before I gave you an answer.

1824. Supposing crushed sandstone is used, is it not then pulverised so that the grain is lost? Crushed sandstone is a good sand. If you get hard sandstone and crush it it makes very good sand for concrete.

1825. But may not certain kinds of sandstone give too great a quantity of loam in the mixture? Not if you get good hard sandstone.

1826. What about top block sandstone? Of course, some of it would go to powder.

1827. Cement put in loamy sand will make bulk, will it not? Loamy sand, of course, would not be nearly so good as coarse gritty sand.

1828. But in the case of sand which has a good sharp grit the cement loses itself in the interstices between the grain, does it not? They bind better if there is a good coarse grain.

1829. And if there is loam the cement does make bulk? I would not say that; but if it were loamy sand it would, of course, be inferior. It would not be so good as gritty sand.

1830. The only portions of Contract No. 77 which could come under the Monier system would be the arches of the aqueduct and the aqueduct superstructure; would they not? I have never seen plans of the Monier system.

1831. *His Honor.*] Do you know the principle of the Monier system at all? I have heard incidentally that it is the binding of iron with cement, but I have never seen plans or specifications.

1832. *Mr. Parkes.*] Supposing the work under the Monier system comprised one-third of the whole job, and that you had received a contract at a special price, would you expect to be paid 25½ per cent. in addition to what you had undertaken on your contract? You mean that a reduction in value ought to apply also to the portion containing the Monier system. Roughly speaking, I should say so, but I should not like to express a definite opinion without seeing the plans.

1833. You feel satisfied in your own mind that you could have carried out the contract from the original plans on No. 77 at 25½ per cent. below the prices estimated by the Department? Yes; I am quite satisfied on that point.

1834. *Mr. Hickson.*] As to the crushed sandstone, you know, as a practical man, that that is the best sand that is used? Yes; I consider that it is equal to any sand.

1835. As to the contract you are carrying out now, No. 112, do you remember having a conversation with me, in the course of which you told me that Messrs. Carter, Gummow, & Co. had made a claim upon you? Yes.

1836. Do you remember what I told you? You said that if there were any bother you would strike the bars out.

1837. Did they found their claim upon the whole contract price? I could not say at this moment, but that is certainly the impression in my mind.

- J  
McSweeney.  
8 June, 1896.
1838. Did I not tell you that they could make no claim whatever in respect of any part of the contract except that in which the Monier plates were used? You might have said that.
1839. You do not remember my telling you that in the porch of the new building when we had come down in the lift together? When I said I would resist the claim I remember your saying that you did not think the claim was tenable.
1840. Were you to supply the Monier plates? No; they were to be supplied by the Department.
1841. So that if anyone had had to pay anything upon them it would not have been you, but the Department? The letter I received distinctly asked me to pay the royalty, and I should not have taken any notice of the matter except for that.
1842. So far as the Department is concerned your contract was not to make the Monier plates? No.
1843. Did I not tell you at the time of the conversation to which you have referred that if there were any trouble over the patent I would take the plates out of the contract? Yes.
1844. You distinctly remember my saying that? Yes.
1845. I understood you to say that Mr. Darley made the change? Yes.
1846. Because, I presume, the works had been handed over to him; he would naturally be the officer who would make the change? Yes.
1847. With regard to the material which is to be used in connection with the Monier patent, you know that it is not concrete but compo.? I have never seen the plans at all. I know nothing about them.
1848. As a matter of fact it consists of 3 to 1 compo., with iron bars 4 inches apart—a network of bars; had you any price in your schedule which would cover work of that description? None whatever.
1849. *Mr. Gummou.*] If you tendered at a lump sum for contracts, would you afterwards expect that the Department would supply you with a schedule with 25½ per cent. off—in other words, does it make any difference what schedule you get in the meantime for the making of progress payments? If I tendered a lump sum for a contract I should take it that that would cover the whole thing.
1850. But would you not require some schedule on which to make your monthly payments? Yes; a schedule would be required as the basis of payment.
1851. With regard to sand, I think you said that sand made from hard sandstone would be very good;—what sort of sand would soft stone make? It would be very likely to make bad sand.
1852. In what way? It would be very likely to crush too fine. You would not have the same grain to bind with the cement which you would have in the case of a coarse, gritty sand.
1853. Have you never seen soft sandstone which would make splendid sand? I am merely giving you a general opinion. I should certainly say that soft sandstone would not make as good sand as would hard stone. I have used a good deal of sand from crushed sandstone myself, but I have never seen any inferior stone ground up.
1854. Is it not a fact that sand from soft stone may be just as coarse as is sand from hard stone? No; I think not.
1855. Why could it not be? The sand in the soft stone would be more likely to go to powder. You would not get as good a grit in it as you would in the case of sand from hard stone.
1856. Take a hill of soft sandstone not going through the crusher, do you mean to say that you could not get good coarse sand out of such stone? As I said before, I am merely expressing a general opinion.
1857. But supposing that sand passes the Government test? Then it would be all right.
1858. *His Honor.*] You never have experimented upon soft and hard sandstone for the purpose of testing the relative sharpness of the sand which comes from them? No.
1859. Hard sandstone would require to be put under a heavier crusher than would soft sandstone in order to break it up? Any sandstone will crush very readily in a machine.
1860. Can you adjust the machine to the hardness of the stone you are putting through? You want to go more slowly when crushing soft stone than with hard stone. For instance, I have put blue metal into the machine, and you can go as hard with it as you can get the engine to go.
1861. What you intend to do is to separate the original grains if you can? Yes; we want to leave the sand as coarse as we can—gritty, lumpy sand.
1862. As to the compo. and concrete—the relative cost of the two for a given block;—what do you say as to that? I could not express an opinion without going into the matter very carefully; I could not possibly express an off-hand opinion.
1863. You have not gone into it, as you are not in the habit of using compo.? I have never used compo. at all, except for rendering—that is, for finishing concrete work, when we sometimes put a five-eighths skin of cement on.
1864. That would be a very hard and fine compo.? Yes; it would make the inside of the sewer smooth, and would permit of the water running freely.
1865. You charge for that by the superficial yard? Yes.
1866. So that you have not gone into the question of how much a cubic yard would be worth? No.

Cecil West Darley recalled and further examined:—

- C. W. Darley.  
8 June, 1893.
1867. *Mr. Parkes.*] In connection with Contract 69 I would like to ask you a few questions? Upon reading my evidence I find that I misunderstood you the other day. I assumed that your question 746, and a few of the succeeding questions, had reference to Contract 79, and I answered them accordingly. I see from the evidence that your question referred to Contract 69.
1868. Upon what date was the Sewerage Construction transferred from Mr. Hickson? It was transferred from Mr. Hickson in March, I think.
1869. You took it over in March? Personally, I did not. Mr. Smail took it over upon my behalf. I was absent for some time; and on my return to the Colony I commenced my duties in this connection. That would be about the end of May.
1870. Was Mr. Davis not in charge as Supervising Engineer at that time? He was in charge previous to the transference from Mr. Hickson to myself.
1871. Is he not Supervising Engineer under you now? No; he is now with Mr. Smail.
1872. And is not Mr. Smail under you? No.
1873. In June, 1895, was not Mr. Davis under you? No; Mr. Davis was never under me.
1874. He was under Mr. Smail was he not? No; when the sewerage passed from Mr. Hickson it passed

passed from Mr. Davis too. Mr. Smail took up the work, and his own engineer acted as supervising C. W. Darley. engineer. That would be Mr. Griffiths.

1875. But Mr. Davis continued to have charge of the sewerage after the transfer, did he not? He helped <sup>8 June, 1896.</sup> Mr. Smail with his advice.

1876. But he was still acting as supervising engineer, was he not? He is now, but he was not at the time you are speaking of. I never had Mr. Davis under me in connection with sewerage.

1877. Do you mean to tell me that Mr. Davis is not actually supervising the sewerage works? He has gone back to it. Perhaps the better way to put it would be that he is again supervising engineer for sewerage. For nearly a year he was not doing so.

1878. *His Honor.*] There were a number of retrenchment changes made, and then followed the big retrenchment, under which everything was altered again? Yes.

1879. *Mr. Parkes.*] As a matter of fact, when you took over Contract 69 were not all the excavations and the packing and lining of the drives completed? I do not know. I do not think it was all completed. I did not examine it for some time after I took it over.

1880. Were not the final vouchers paid on the 23rd October, 1895? I cannot recollect. I am not certain whether the final vouchers have been adjusted even yet.

1881. Are not the words "final voucher" contained upon the document I now hand you? I think that is a mistake. It should read "Final progress voucher," not "final voucher." (*Vide Appendix No. 14.*)

1882. Can you tell me what work was being done upon the contract when you took it over? The Marrickville road trenches were all open. On my first visit they were working underground.

1883. As a matter of fact, do you not allow three months for maintenance before you pay the final voucher? Yes.

1884. The document gives the sum of £54,320 7s. 7d., which is an increase on the original contract of £10,000;—is not that the final voucher? I cannot say without refreshing my memory.

1885. Why should it be marked "final voucher"? I noticed the mistake in the printed return. I knew that it was only lately that I made up the contract. It was one of the last things I did before I gave up. I remember asking one of my officers whether a mistake had not been made, and he said that the voucher should have been a final progress voucher, but not the final voucher of the contract. That voucher, I think, has not been adjusted yet, or if it has been it can only have been done very recently.

1886. Coming to Contract 77, you were a member of the Board of Reference when Mr. Hickson produced before the Board the original office plans of the contract and proposed to substitute a plan upon the Monier system? Yes. (*Vide Appendix C.*)

1887. When that contract was produced before the Board of Reference, did you go into the question of the comparative cost of the substituted and the original office plans? I did not.

1888. You took Mr. Hickson's recommendation as sufficient to guide you? Yes; I had no time to go into the matter then.

1889. Afterwards, when you came to look into the quantities, you found that they were greatly reduced as compared with the original contract? Some of the quantities were reduced.

1890. Is it not a fact that the principal thing comprised in the Monier patent is the iron work—the lattice work? Iron is introduced.

1891. What proportion of the contract do the items bear, speaking roughly,—I mean the items which are properly chargeable to the system. For instance, take the item No. 21—special bluestone concrete—that belongs to the Monier system? Yes. (*Vide Appendix No. 11.*)

1892. Then there is No. 24—special cement facing, 1 to 1—that also belongs to the system? Yes.

1893. Then there is No. 22—brickwork in cement in facings, arches, circular-panels, pilasters, corbels, piers, spandrels, parapets—that has been reduced from 2,020 to 150 cubic yards;—that item would come within the Monier system, would it not? Yes.

1894. Then there would be item No. 23—cement facing, 1 to 2, in any situation where ordered—that has been altered from 2,960 square yards to 12,000, that is also in the Monier system? Yes.

1895. Then there is the item, "cast-iron plates, 12 tons, at £11 3s., or a total of £133 16s., that also comes in in the Monier system? Yes.

1896. Then there are tie-bars, channel-iron, 22 tons, at £15, or a total of £330—that is also part of the system? Yes.

1897. Then there are  $\frac{3}{4}$  and  $\frac{1}{2}$  in. iron rods, bedded in cement mortar, 44 tons, at £10, or a total of £440—that also comes into the Monier system? Yes.

1898. And these items comprise the whole of the contents of the Monier arches? Yes.

1899. There is a very great reduction upon the original plans so far as quantities are concerned, is there not? It is a completely new design.

1900. But is there not a very great reduction comparing the quantities with the original office quantities? There is a reduction.

1901. A very great reduction? It is a different class of work.

1902. For instance, the item of 2,020 cubic yards for brickwork, of a special kind, has been reduced to 150 cubic yards—that in itself is a big reduction, is it not? Yes.

1903. Then the item of special cement facings, which has been altogether omitted, constitutes another important difference, does it not? I think there is a mistake there. I am under the impression that my supervising engineer when he ran out these quantities thought that all the cement work was to be 2 to 1, whereas a portion of it should have been 1 to 1.

1904. As a matter of fact you are paying the contractors upon this schedule, are you not? Yes, so far as I am aware, but none of that work is done yet. Moreover, the schedule can be altered at the engineer's discretion.

1905. The schedule makes up the exact sum of the contract, does it not? It is a lump sum contract, and in order that there might be some guide for the payments, I instructed the supervising engineer to prepare a list of prices which would cover the lump sum.

1906. Do not all the items in the schedule from No. 1 to 20 belong to the original plan, having nothing to do with the Monier system? Practically, that is so.

1907. And the items from 32 to 42 also have nothing to do with the Monier system? That is so.

1908. If you will take my addition as correct you will find that by adding these items you get a sum of £9,200 of work not affected by the Monier system? I think it might come to about that.

1909.

- C. W. Darley. 1909. Did not Messrs. Carter, Gummow, and Co. undertake to do the work at  $28\frac{1}{2}$  per cent. below your office valuations? On the original plan, yes.
- 8 June, 1896. 1910. Why should the officers of the Department not adhere to that undertaking on the part of the contractors? Because the tender at  $28\frac{1}{2}$  per cent was not finally accepted.
1911. You had twelve contractors, all tendering at percentages below the office value—is not that so? Yes.
1912. Carter, Gummow, and Co.'s tender at  $28\frac{1}{2}$  per cent. was the furthest below? Yes.
1913. Do you not think it is pretty rough upon the taxpayers of this country that they should be asked to pay  $28\frac{1}{2}$  per cent. over and above the amount which the contractors required to do this work? That is not the case. A contract for a lump sum was accepted in lieu of the contract at  $28\frac{1}{2}$  per cent., and the difference between the two contracts represented a saving of something like £250—in favor of the contract at the lump sum.
1914. When you called for tenders certain sums were put down as the office valuations of the work? Yes.
1915. Are you not paying the contractors upon those office values? There are certain portions of the work on the Monier system concerning which there were no office estimates.
1916. But I mean leaving the Monier system out altogether? It is a lump sum contract; you cannot do that.
1917. But there is a certain amount of underground work in the contracts which has nothing to do with the Monier system? Yes.
1918. There is a certain amount of open cutting and other work which has nothing to do with the Monier system? Yes.
1919. And the contractors undertook to do that work at  $28\frac{1}{2}$  per cent. below office values? Yes; the contract price was £15,757.
1920. Therefore, £9,200 worth of work is being paid for at  $28\frac{1}{2}$  per cent. above what the contractors undertook to do it for? That is not a fair way of putting it. You must make allowance for the Monier arches.
1921. Leaving those out of the matter altogether, treating them as a separate thing, and as having nothing to do with this work, are the contractors not being paid upon the original office values;—here is your schedule for payment, and you will find that the figures tally? I might mention that these figures are no part of the contract; they do not appear in the contract. They are merely put into this schedule as guide for progress payments—to prevent any over-payments. They are quite arbitrary figures, and I can vary them as I like.
1922. These, however, are the rates at which the contractors are being paid? Yes.
- 1922½. *His Honor.*] Paying the contractors these rates while the contract is in progress, will you ever end by paying the contractors more than £15,500? No; we stop at £15,500. So far as the Monier arch portion is concerned, the contractors have to take the whole responsibility of putting them up; and, as a matter of fact, I ordered them to put in extra strength, which I thought was required. They will have to complete the work in a satisfactory manner.
1923. *Mr. Parkes.*] The point I wish to emphasise is this: Is not the country a loser on the prices you are paying to the extent of  $28\frac{1}{2}$  per cent.? Not by a penny.
1924. How is that? Because the contract is based on a lump sum, arrived at by taking  $28\frac{1}{2}$  per cent. off these prices.
1925. If that is so, why do you not pay for the whole of this work at a reduction of  $28\frac{1}{2}$  per cent. upon the original estimate of the Department? Because the introduction of the Monier system so completely altered the design. There would be nothing to pay for the centerings under the arches, which is a very heavy item.
1926. What would be the total cost of the centerings? I cannot say at this moment, but the erection and taking down of the centerings would be a large item.
1927. Do not your specifications make it necessary to put centerings in these arches? But the prices of the material will not pay for them. They have to be distributed over the whole contract.
1928. Are not centerings provided for under the contract? They have to be paid for, and in order to do that it is necessary to distribute them through the prices.
1929. Have not the contractors to provide centerings in order to carry out the work at all? That is so; but they must get paid for them in the prices of material.
1930. Would they not be one of their plant risks? They must be paid for from the prices of material.
1931. I suppose arches were contained in the original contract? As I have said, it is necessary to put in a price that will pay for the centerings. You cannot make the contractors pay for them out of their own pocket.
1932. *His Honor.*] Are the centerings used in connection with the Monier arches more numerous and more expensive than would be the case in the arches originally proposed by the Department? That is so. In the case of the Monier arches, the centerings can be used only about four times.
1933. *Mr. Parkes.*] As a matter of fact, are there not six more arches in your original plan than in the case of the Monier plan? But there are smaller centerings, and these could be moved on and used a number of times. The price is contained in a large quantity of brickwork which is omitted.
1934. Has not compo. been substituted for the brickwork? Yes; but in a much smaller quantity. Of course, if we were getting out fresh prices for the whole thing, the price of the centerings could be put in.
1935. If this contract had been completed upon the quantities shown upon your own estimate, and upon which, according to the vouchers, you are paying the contractors, would not the country have been entitled to receive a reduction of  $28\frac{1}{2}$  per cent. from Carter, Gummow, and Co., on these items? No.
1936. Why not? Because it is already taken off.
1937. Where is it taken off? In the £15,757.
1938. You have certain quantities which make up the exact sum of £15,500, have you not? Yes.
1939. These quantities are being paid at the original office rates? In this case they are merely arbitrary or tentative rates.
1940. Although after the tenders were in you had an opportunity of getting this work done at a price  $28\frac{1}{2}$  per cent. cheaper than the rate at which you are paying for it, you decided that the country should pay a sum of something like £5,700 in order that this special patent arch might be given to the country? That



That is not the case at all. The original contract at these prices would have come to a certain amount, 28½ per cent being struck off, it was brought down to £15,757. The contractors offered to carry out the whole work at £15,500, so that the country benefits to the extent of £257.

C. W. Darley,  
8 June, 1896.

1941. Does this patent affect any other portion than the arches and the aqueduct above it? No; those are the portions affected.

1942. Therefore, in order to test this patent, the country has to pay at the rate of 28½ per cent. on all the other work which is not comprised within the patent? I have already said that that is not a fair way of putting it.

1943. *His Honor.*] Take any contract tendered for under the new system, the contractor tenders at schedule rates, that is, at a percentage running right through the prices. When you are making progress payments do you make them in practice on the original schedule prices, or do you make them on the new schedule prices arrived at by reducing the original schedule prices by the percentage of reduction on the whole contract? We pay on the original prices, and deduct 28½ per cent.

1944. In making progress payments upon this lump sum contract for £15,500, on what basis have you gone when you have been paying on items for which schedule rates have been originally set down;—have you paid right through upon all the items at the original estimated rates, or what have you done? We have paid at the original estimated rates. The schedules allow for only nominal rates on the Monier portion. If we had made a fresh estimate we might have put these prices in; but instead of altering the whole thing it has been simpler to do as we have done.

1945. When you get on to the Monier items, how do you pay for the composite and for the iron, for instance? We put down a value which would about balance the lump sum. Seeing, for instance, that centerings bear such a large proportion to the cost of the arch we ought to put a large price on to the composite to pay for the centerings, whereas a comparatively small price has been put on to the composite, having regard to the costly nature of the work.

1946. The composite and the accompanying iron grid are not items in the original specification at all? No.

1947. Then, the question is, how in making progress payments you arrive at the cost of them? My officers put down a price which is really a very low one for the work, in order to balance out the lump sum.

1948. *Mr. Parkes.*] They have put down an item of £3 10s. for cement and composite? Yes.

1949. *His Honor.*] Where the items appear in the original schedule, the practice is to pay at 28½ per cent. below the original schedule rates in this particular contract? We do not pay below the original rates. We left the rates as they were, and then fixed prices for the Monier so as to balance.

1950. Then you ignore the 28½ per cent.? Yes; because it is no part of the contract. It is the lump sum with which we are concerned.

1951. Paying in that way, will it not follow that the progress payments will finally come up to the total payment due before the total work is completed? No; the original quantities have been altered very closely to meet the work, as it is likely to come out in the end.

1952. That alteration has been made only on the aqueduct? The prices are all modified upon the aqueduct.

1953. But on the underground part of the work they remain the same? Yes.

1954. You are now paying on that part of the work as well as on the other at the original schedule rates, not at the rates reduced by 28½ per cent.? No; that is no part of the contract.

1955. You count that out altogether? Yes.

1956. *Mr. Parkes.*] Take your original brick, stone, and concrete structure, you had 2,020 cubic yards of brickwork. In the substituted Monier system that is reduced to 150 yards. In your original estimate you had 2,350 cubic yards of sandstone concrete; under the Monier system, that is reduced to 1,800 cubic yards. In your original design you had 590 cubic yards of bluestone concrete; that is reduced to 300 cubic yards. In your original design you had special cement facings to the extent of 2,750 square yards. That has been taken out? I have already told you that that will not be taken out; it has to go back.

1957. But are you not paying for that work on the vouchers as the work is going on? None has been done yet.

1958. You are paying for cement facing in the proportion of 1 to 2? But a portion will have to be 1 to 1.

1959. Then there is an item of Pymont bottom block sandstone ashlar, 13,250 cubic feet, which has been struck out, and there is also an item of brickwork in cement in facings, arches, &c., 2,020 yards, which has been reduced to 150 yards. The only item upon which there is an increase is upon the special bluestone concrete, which has been increased from 1,000 cubic yards to 1,050 cubic yards. You will see, therefore, from these various items which I have read, that the quantities on the Monier arches are enormously below the quantities as estimated in your original design? The quantities are below the original quantities, but the entire design has been altered.

1960. But the quantities of material under the Monier plan are greatly below the quantities in the original design? The nature of the material has been altered.

1961. You are paying for that material at office rates, are you not? We have no office rate at all for the compo.

1962. You have fixed rates which must have been satisfactory to the contractors, because, instead of special bluestone concrete at £2 10s., you have compo. site at £3 10s.? That price has been put in for progress payments.

1963. Then there are 153 cubic yards of brickwork in cement in facings, &c., at £2 10s. per yard—that is, as it stood originally? Yes.

1964. Then there are 12,000 cubic yards of cement facing, 1 to 2, in substitution for 2,960 yards, and you are paying for that at 2s. 3d. per yard, the original office value? Yes.

1965. Do you not think, then, that, when you give these contractors the original office value, the taxpayers of this country are made to suffer by reason of the adoption of the substituted scheme? The taxpayers are not made to suffer at all.

1966. Not when the substituted scheme is being paid for at the rate above that tendered by any other contractors tendering? The nature of the contract is so completely altered, that we are getting material quite foreign to that specified.

1967. What does it matter how much the contract is altered—there is only one way to arrive at these values, and that is by the quantities and the prices you pay for them? If you divided up the contract you would find that you would have to pay a large price to get the arches put in.

1968.



- C. W. Darley. 1968. As a matter of fact, have you not done that;—have you not taken out the quantities and divided the contract? So far as the Monier arch is concerned, we should have to pay the patent rights or royalty, and the extra cost which is not covered by these prices; they would not pay for the compo.
- 8 June, 1896. 1969. The compo. is not altogether the cost of the substituted plan;—there is 150 yards of brickwork;—there is no reason why that should be increased in price because you adopt the Monier system? I cannot remember at this moment where that work would come in.
1970. Is there any reason why you should increase the cost of the concrete because you adopt the Monier system? It depends upon the circumstances. We are altering entirely the nature of the work.
1971. Some concrete goes into both jobs;—is there, then, any reason why its cost should be increased? I am afraid I cannot explain the matter to you further. These prices were simply put down in the schedule to balance the lump sum arrived at. We have tried to put on a fair price. We have allowed for the royalty for the patent and for other matters.
1972. Is no dependence to be placed upon your original quantities? I do not say that at all. The quantities are adjusted to arrive at the figures contained in the lump-sum contract. They do not include the royalty and a number of things of that kind.
1973. Must the royalty be paid? No doubt it is included in the contract sum.
1974. Will the royalty be paid upon the entire aqueduct or only on the arches? I take it that when we pay £15,500 we pay whatever royalty may be chargeable. I presume it would be chargeable upon the arches.
1975. That would be 15 per cent.? The contractors asked 15 per cent. originally, I think.
1976. *His Honor.*] I understand you to say that the contractors in tendering took the royalty into consideration—I do not understand that you say that the royalty is to be paid in addition to the contract price? No; if we took the original departmental prices of the tunnel portion of the work and reduced them by 28½ per cent., and paid on the prices put down in the schedule, that would leave the contractors nothing for the royalty, for instance, and nothing for their centerings. We might have recast all these prices, as I have said, but it seemed unnecessary to do so in the case of a lump contract. It seems to me to be immaterial how you fix the prices so long as you do not eventually exceed the lump sum.
1977. *Mr. Parkes.*] Who took out these quantities? The supervising engineer, Mr. Griffiths, who checked them with the quantity surveyor.
1978. Who is the quantity surveyor? I forget his name now, but he would be one of the draftsmen in the office.
1979. Are they thoroughly reliable men? Yes.
1980. You have no reason to think that the quantities in this schedule are wrong? No; they are sufficiently near, I think.
1981. You approved of them? Yes.
1982. You knew that the quantities were correct? I have no reason to doubt the correctness of the quantities at all. I looked through them, and I saw that they about balanced with the lump sum. It was immaterial to me what the prices were.
1983. Seeing that these quantities are correct, and that the quantities are being paid for at the original office rates, and that you have a contractor who would do this work at 28½ per cent. under the office rates, would it not be a fair thing to the taxpayers if this sum of £15,500 were reduced by 28½ per cent.? Certainly not. That has been arrived at by reducing the lump sum by 28½ per cent.
1984. But it has not? It undoubtedly has. The sum of £15,757 was 28½ per cent. off the original contract.
1985. But this new Monier plan is taken out from the same description of quantities as the original office plan; therefore I want to know whether the sum of £15,500 ought not to be reduced by 28½ per cent.? Certainly not. In that case you would be getting the arches done for nothing.
1986. Would it not have been to the interests of the taxpayers to have had the more costly structure carried out at the 28½ per cent. reduction? I have already pointed out to you that the taxpayers are gainers to the extent of £257.
1987. By paying for the work without the reduction of 28½ per cent.? Certainly not.
1988. *His Honor.*] Have you formed any estimate, rough or otherwise, of how much the whole scheme could be constructed for upon the Monier system, worked out irrespective of any reduction by the tenderer on the basis of the office prices;—have you made any calculation to try to discover whether the change from the office proposal to the Monier system on that part of the work would have reduced the whole estimate much below £22,000? I believe that has been done, but I have not done it personally. If we were to take off 28½ per cent. we should have largely to increase these prices in order to make allowance for the expensive nature of the work.
1989. *Mr. Parkes.*] Is compo. at £3 10s. a yard 28½ per cent. below its value? It is more than 28½ per cent. below its value from the way in which it has to be put on. If you put up the prices under the original contract schedule, and then re-let the work, we should have to pay more like £6 a yard for the Monier patent portion of it.
1990. *His Honor.*] That is for the compo. and lattice work? Yes. The centerings are very expensive and the arches are very tedious to put in. The compo. has to be put in by hand, and work has to be done bit by bit—shovelful by shovelful.
1991. *Mr. Parkes.*] If you were a private employer, and were employing an engineer to do work for you, and you had an opportunity of getting the work done under tender 28½ per cent. below your engineer's valuation, would you allow a contract to be worked out at 28½ per cent. above what the contractor absolutely undertook to do it at? If it were an ordinary job, and the price given would complete the work, I should certainly take advantage of the 28½ per cent.
1992. As a matter of fact is not the Monier system, as applied to the arches, the only thing which does not make the contract an ordinary contract? The arches and the superstructure.
1993. The rest of the work is an ordinary work? Yes.
1994. Would you not gravely grumble if your engineer asked you to pay 28½ per cent. above what the contractor contracted to do the work for—that is, if it were a private work of your own? As I have said, you cannot divide up this work in that way, because you will have to leave a large portion of the work unfinished. You would be at the mercy of the contractor, who would be able to ask you any price he liked for his own patent.

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8 June, 1896.

1995. Seeing that you had schedules taken out, and that these divided up the work, would it not have been fair that the 28½ per cent. should have been taken off those portions of the work not affected by the Monier arch? It comes to the same thing.
1996. If items 1 to 20 in the schedule I have handed you were not affected by the Monier arch, what was to prevent your saving the country 28½ per cent. upon those items? There was nothing to prevent it, but you would have had to put the amount on to the other portion—on to the patent portion.
1997. You have put down £11 3s. for 12 tons of cast-iron plates, &c.—is not that a good price for the iron-work;—is not 28½ per cent. off that a fair value? In the construction of the arches you have to remember that with a 75-foot span the centerings would be a very heavy item.
1998. But leaving the centerings out of the question? I cannot do that: They are included in both schemes.
1999. The price fixed for channel iron is £15 per ton—is that 28½ per cent. below the market value for that material? No.
2000. Then take the ¾-inch and ½-inch iron rods—is £10 a ton 28½ per cent. below their value? That would be a fair value.
2001. These constitute the items of the Monier arch;—therefore, as a matter of fact, it is not being paid for under a fair value, is it? At the prices which are being paid it would be considerably under value. We must put in a price which will provide for the centerings.
2002. Do not these centerings afterwards become the property of the contractor? They would be useful for very little beyond firewood when the work is finished.
2003. What would be their value? It would amount to a considerable sum on a 75-foot span.
2004. In other cases centerings can be used again and again;—you can distribute the price if the centerings can be used in that way? If you can use a centering six times you would only put one-sixth of the value on to each arch. If you could use it only four times you must put one-fourth of the value on to each arch.
2005. Would not £300 cover the price of the centerings? Putting them up and taking them down—certainly not.
2006. What figure would cover the cost? I should require to go into figures before answering that. I could not say off-hand.
2007. It would come to hundreds of pounds? Yes.
2008. Then when we are dealing with the sum of £5,000, what effect can that amount have? It has a very great effect upon the price of material.
2009. But that does not materially affect the issue? It does, undoubtedly.
2010. On your substituted quantities the total upon the Monier arches would come to £6,300, and upon the office design the amount would be £11,341—that is a difference of £5,000 in the total;—you will see, therefore, that the reduction comes in not in the lessening of the amount but in the lessening of the quantities which are not in the Monier arch? The quantities are largely recast.
2011. By so much that there is a reduction of £5,000? I do not know with what you are instituting a comparison. So much brickwork has been left out, but then other material has been put in.
2012. Taking the figures of your original quantities, and the figures of the substituted Monier scheme, I find that they work out in the ratio of £11,341 to £6,300;—that reduction is made in the quantities is it not? I cannot follow you there.
2013. Take a number of these different items, 2,350 yards of sandstone concrete have been reduced to 1,800 yards;—then the brickwork has been reduced from 2,020 to 150 yards;—the Pymont bottom-block sandstone has been omitted altogether—is not that a reduction in quantities? Some of the items have been left out altogether, but other items have been put in.
2014. 13,000 cubic feet of Pymont bottom-block stone have been entirely omitted, making a sum of £2,318 worked out upon your own quantities? Yes.
2015. And the only substitute you have for these enormously decreased and omitted quantities is about 50 yards of special bluestone-concrete? Well, then there are the patent rights to be considered.
2016. That is about the only thing you can at present put against these reductions? Yes.
2017. Do you not think that the Government in substituting this work for £15,500, when they could have got the original design carried out for £15,757, have been put to great disadvantage and loss? The country has gained £257 by the change. We have an equally good structure for £257 less.
2018. Is that £257 compensation for the £5,000 lost as between the two different kinds of arches? It is not lost. You have an equally good structure for a less sum of money. The original contract sum was £15,757, and you are having the work carried for £15,500. Those are the facts.
2019. Generalities are not worth anything. Here are your own figures, which show a difference of £5,000 between the two aqueducts. The only thing you give to the State for that difference of £5,000 is this sum of £257;—is that fair dealing? That is not a fair way of putting it. I consider that the country has gained upon the transaction to the extent of £257.
2020. Would you deal in that way if your own money were at stake? Certainly; if I could get as good an article for less money I would accept it.
2021. *His Honor.*] If the Monier system had been known here earlier, and if tenders had been called for the whole contract, or for the aqueduct part of it separately from the rest, do you not think a greater reduction than £257 would finally have resulted from the tenders being very much less than the original £15,757? I do not think it would. You cannot get competition upon a patent. All that you can do is to get a price from the owners of the patent. If you did the ordinary work not included in the patent you would have to put prices upon the material to cover the centerings and the royalties. In this particular case they are exceedingly costly in proportion to the amount of work to be done. The centerings can only be repeated twice in this case; in other cases they might be used five times.
2022. *Mr. Parkes.*] Do you make out that the centerings and a royalty make up the difference of £5,000 between the two designs? I do not quite know how the £5,000 is arrived at.
2023. The centerings and the royalty for the patent would not affect the other portions of the contract? If you constructed other portions of the work at a lump sum and then asked the contractors what they could get the arch put in for, you would find that a much larger sum would be asked than we are paying.
2024. Did you give other contractors an opportunity to tender to see if they could reduce the cost of these quantities? I did not; I had nothing to do with that.

- C. W. Darley. 2025. Why did not the Board of Reference recommend that course? Because the other contractors would have had to come back to this particular firm to ask them what they would do the arches for.
- 8 June, 1896. 2026. But the royalty is included in the £15,500? The firm who own the patent are doing the work.
2027. Could not the others have paid a 15 per cent. royalty? I do not know whether they could have done the work on those terms. I do not know what the patentees would have asked. They might have asked 30 per cent.
2028. Would it not have been a fair thing to call for tenders upon this Monier principle as well as upon the Departmental design? The thing only cropped up when the tenders came in.
2029. Would it not have been a wise and proper thing to take that course? You would have had to stop the work in order to call for tenders. The Monier system had not suggested itself, I presume, to the officers of the Department.
2030. Had you not had a consultation with Mr. Hickson about the matter before? No. I never saw this aqueduct before the tenders were called for. Before the tenders came before the Board of Reference I did not know whether it was to be a pipe or an aqueduct.
2031. Do you know anything about the Monier arches now? Yes. My attention has been directed to the matter since.
2032. Do not you think that as there is only a difference of something over £200 between the two contracts it would have been better to have a good substantial structure instead of taking the risk of the Monier system? I do not think there is any risk, and you are getting a much nicer-looking structure.
2033. If there be no risk, why did you, as one of the Board of Reference, suggest that on account of the risk good surety bonds should be given? It was a new thing at the time, but I do not now think that there is any risk in adopting it.
2034. *His Honor.*] Can you give me the discharging capacity per minute of the Monier aqueduct? I cannot. I had nothing to do with the getting out of the design.
2035. *Mr. Smith.*] You were a member of the Board of Reference in March, 1895? Yes.
2036. I want you to look at the report of the Board under date March 20th, 1895, which appears upon pages 206 and 207 of the Parliamentary Papers ordered to be printed on the 22nd October last; is that a correct report of what took place at the meeting of the Board of Reference? It is.
2037. From that it would appear that you and Mr. Hickson had discussed this question of the introduction of the Monier system before it came before the Board? Yes.
2038. Mr. Hickson had come to a certain conclusion, upon which a certain recommendation was made? That is so.
2039. You endorsed the view of Mr. Hickson in the matter? I did.
2040. You thought the Monier a sound system as far as you could judge, and that it would be a good thing to apply it to this particular contract? Yes.
2041. A good deal of work has since been carried out under the system, and you are still of opinion that your advice was sound? I am still of the same opinion—in fact, the experiments which have been carried out since that date have confirmed me in the view I then took. I did not then know as much about the matter as I do now.
2042. In the case of this particular plan the work in the arches is of a heavier and more substantial nature than would be the case under the ordinary Monier system. The Monier system is adopted, as a rule, with a view to making the work much lighter? There have been arches constructed under the system much lighter than these.
2043. But this being the first time that the system had been imported into any work done in this Colony, it was made a good deal heavier than usual? Yes. Quite strong enough, I think, to do without the iron altogether.
2044. This schedule we have heard so much about was prepared by Mr. Griffiths? Yes.
2045. As I understand the matter, it was a schedule made out simply for departmental purposes? That is so.
2046. It is no part of the contract at all? No.
2047. The contractors had no say in the matter at all? No.
2048. The schedule was made out merely to enable your Department to arrive at a conclusion as to what the amount of each progress payment ought to be? As a means of valuing the work monthly.
2049. I understand that in making out this schedule you have taken those items which do not involve the Monier system upon the schedule rates originally prepared by the Department? Yes.
2050. But with regard to those items which did involve the Monier system you have made no special estimate, but have averaged them among the remaining items, so as to bring the total within the lump sum constituting the contract price? That is so.
2051. So that you did not go into the question as to the real value of those items which made up the Monier system? I did not.
2052. It is perfectly misleading to state that those items which do not involve the Monier system are being paid for at the rate of 28½ per cent. more than the contractors were prepared to give for them? Quite misleading.
2053. I suppose that in making the progress payments you kept back the usual amount of retention money? I do not think any retention money came into the contract. It is a lump-sum contract. There would be merely the original contract security.
2054. I suppose that in all these lump-sum contracts you must have some sort of schedule, such as that upon which you have been examined, to permit of your making progress payments? Yes. Take a case in which Mort & Company build a dredge for the sum of £38,000 or £40,000. They give us a lump sum; then our officers have to value the work. The Department goes through it and puts in certain prices upon which we determine to make progress payments. When the contract is entered into we divide the work into certain sections, and fix prices covering those sections upon which progress payments are made; but we are very careful towards the end of the work in seeing that there is no risk of over-payments. We have sometimes to alter the quantities to prevent over-payments. Prices are fixed simply to arrange the progress instalments. Architects who let large contracts for buildings often give a certificate to a builder for the value of the work performed up to a certain date; but the owner, in paying that amount, does not know what prices he is paying.

2055. Let me draw your attention once more to Mr. Hickson's minute, which appears upon page 207 of the Parliamentary papers, to which I have just referred:—

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To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm, estimates were made for the work on the Monier system, as well as on the Department's. The result was that the estimate of both works was practically the same. Applying that comparison to this case, it would mean that the Departmental estimate for the work under consideration would be £22,000.

Did you see the comparative estimate made by Mr. Bagge? I saw a copy of it the other day. I did not see the original.

2056. You did not consider it at the time I am speaking of? No.

2057. What you say now, after your experience of this particular system in connection with this plan, is that the Government are getting, if not a better, at all events as good a work for the sum of £257 below the lowest tender for the original design? That is my opinion.

2058. *Mr. Gummow.*] In the case of this particular contract, I think you said there was no retention money, but that there was a bond and sureties, and, I suppose, also a deposit? A deposit was made.

2059. Will you look through these papers and see whether there is any reference to retention money;—I think you made an error in speaking of that? I see that there was retention money—£775.

2060. Could any tender be let for work upon the Monier system without rights being given to the contractors by the patentees? I think not.

2061. With regard to the payments under the schedule rate system, do you pay the contractors upon what is shown on your printed schedule, or upon what is actually taken out? We pay them upon what is actually taken out.

2062. If, in a contract under the usual schedule system, the contractor takes out double the quantity of excavation or double the quantity upon any other item, do you not pay him for what he takes out if it is ordered? Yes; the quantity may be doubled. In that case the amount paid would be doubled.

2063. And under a lump sum contract the contractors have to take the risk? Yes; the contractor takes the risk in the case of this particular contract.

2064. If a contractor has to take out more excavation than is allowed for in his tunnel, does he get paid extra for it? No.

2065. That is the contractor's risk? Yes.

2066. With regard to the brickwork quantities, for which 2,020 cubic yards is shown in the original items and 150 yards in the amended items, do you know where it is put in? I cannot call to mind at this moment where it would come in.

2067. Would it be likely to be in the tunnels? Very likely.

2068. Do you consider that brickwork—that is, single-ring work—can be done on the arching of a tunnel at the same price as that at which similar work could be done in the open air? No.

2069. Therefore, the price of 50s. as applied to one class of work does not apply to the other—the difference in the work completely alters the prices? Yes; the same price would not apply.

2070. With regard to the sum of £5,000 mentioned by Mr. Parkes—I do not know whether his figures are correct, but assuming that they are—should not that amount have 28½ per cent. deducted upon the line of argument which he advanced? I do not know how the £5,000 is arrived at.

2071. Presuming that it is arrived at from the printed figures shown in the schedule, should it not have 28½ per cent. taken off? If it relates to the original tender; but the 28½ per cent. does not come in in the case of the contract. Of course, for the purposes of comparison with the original tender, the 28½ per cent. would have to come off.

2072. As to the quantities: do quantities necessarily make the better job; if you put in 10 tons of iron-work where a ton of iron would do, does it make the job any better;—what I mean is, do you necessarily get any benefit from the increase of quantities? Not necessarily. You can put too much material into a job.

2073. The quantity is not necessarily a guide as to the value of the work when finished? Not necessarily at all.

2074. *Mr. Parkes.*] I understood you to say that so far as the Monier arch principle was concerned no other contractors could tender? It is a question of law. I do not know how the matter stands in the light of the latest decisions; but I am under the impression that if you own a patent no other tenderer can use your patent without permission.

2075. What was the good of your going to the trouble and cost of having designs like those for Contract No. 77 prepared if you were going to give Carter, Gummow, & Co. the tender upon the Monier principle, and if no other firm of contractors could tender upon that principle? When Mr. Hickson had those plans prepared, I presume he did not intend to introduce the Monier system. It was sprung upon him as it were. It was a suggestion emanating from certain contractors after the contract designs were prepared. They submitted an alternative design with their tender.

2076. Are you sure that you never discussed the Monier principle with Mr. Hickson before it came before the Tender Board? I think he had called my attention to it, but not in connection with any particular contract. I remember his showing me some French work about the Monier system. I think he was the first to call my attention to it. I think he said he would like to introduce it into some of our country bridges, but his observations had no connection with any particular contract.

2077. Did you understand the Monier system when it was brought before the Board of Reference on the occasion referred to? Yes.

2078. You knew all about it? I knew a good deal, but I know more about it now. As a matter of fact, Mr. Hickson gave me some later information on the subject which was looked up before the matter came before the Board.

2079. *His Honor.*] What was Mr. Hickson's manner at those conferences with you;—was he anxious to have the Monier system adopted, or did he leave it quite an open question? His manner was just as usual. In bringing the matter under the notice of the Board he said there were tenders for a certain work, but that one firm had put in a design of their own which was cheaper than the Departmental design, and which was upon the Monier system. He said he thought it worth considering, and I think the Board then decided that I should look into the matter with Mr. Hickson and explain the system to the Board at the next meeting.

- C. W. Darley. 2080. Are you sure you did not see Mr. Bagge's estimate making a comparison between the Monier system and a somewhat similar system in use in Ahearn's contract? I do not recollect seeing it at that time.  
 8 June, 1896. 2081. I mean so as to arrive at some idea as to what the cost of the Monier system to the contractors would probably be? No, I do not remember seeing Mr. Bagge's report at that time.  
 2082. Do you remember the question of the construction of a certain section of McSweeney's contract in connection with the outfall sewer almost entirely in concrete without the use of brick to any large extent—do you remember that being gone into? I remember that a contract was about being let for a length of concrete sewer which was not upon the Monier system.  
 2083. A triplicate sewer? Yes.  
 2084. That was touched upon in conversation between yourself and Mr. Hickson, I mean as regards the relative cost? I do not remember any comparison being made with that work at all.

Henry Deane sworn and examined:—

- H. Deane. 2085. What is your position in the Public Service? I am Engineer-in-Chief for railway construction.  
 8 June, 1896. 2086. You are one of the Board of Reference to whom tenders are submitted before contracts are signed? Yes.  
 2087. Were you one of the Board of Reference to whom were submitted by Mr. Hickson the tenders for contract 77—I mean the Annandale contract? I do not know the number of the contract, but I remember the matter being submitted to the Board.  
 2088. I believe a substituted design was put in on the Monier system by Messrs Carter, Gummow, & Co.? Yes.  
 2089. Did you look into the matter yourself? I have looked into the matter. I know the Monier system.  
 2090. Did you look into the matter then? Yes; the matter was explained at a meeting of the Board.  
 2091. Who explained it? Mr. Darley and Mr. Hickson.  
 2092. Will you tell His Honor the nature of the explanation? I do not know that I can give you very much detail, although the explanation, I think, was this—that the contractors had made an offer to construct the work, by adopting this particular principle, at a lower cost than that of the original tender.  
 2093. The contractors tendered for the original scheme at 28½ per cent. below the office values, did they not? Yes.  
 2094. When this sum of £15,500 was substituted did you understand that that tender also was to be 28½ per cent. under the office values of the work? I do not remember that there was to be a reduction upon the previous tender.  
 2095. But did you understand that that substituted contract was to be paid for at the rate of 28½ per cent. below office values? Did you, in short, make any effort to find out at what rate the contract was to be paid for—that is, at what rate of percentage as compared with the original office values? I think a calculation was made at the time, but I do not remember what it was.  
 2096. Was that made upon the schedule? I mean as to the proportionate decrease upon the whole amount.  
 2097. It was made on the schedule as submitted to you, was it not—how could you make a comparison unless you had a schedule of quantities? We could tell what the total cost of the work would be. The total amount was to be so much less than the total amount tendered for.  
 2098. Was any explanation made to you to show upon what basis the payments would be made for the substituted contract? No; I do not think that was entered into at the time.  
 2099. Did Mr. Hickson make any reference to a test that had been made under Mr. Bagge, comparing three plans of sewers with the outfall sewer which was being constructed at the sewerage farm? Do you mean tests as to the Monier principle?  
 2100. I mean tests as to the price of the work as compared with the office work? No; I do not remember that being brought forward.  
 2101. I suppose there was a little discussion by the Board? The matter took up a good deal of time, seeing that it was quite a new proposal in this Colony.  
 2102. If you had known that there was to be a great reduction in the quantities as compared with those of the original design, and that the contract was to be paid for at the original office values instead of at a 28½ per cent. reduction, would you have sanctioned the proposal? I understood that there was to be a reduction on the total cost, and that being so I recommended the scheme.  
 2103. But supposing that at the time you had known that the contract throughout the work affected by the Monier principle and the work not affected by it was equally to be paid for at the office values instead of at the rate of 28½ per cent. below those values, would you have sanctioned it? I think I am scarcely in a position to say without going into what is involved in your question.  
 2104. Let me put the matter plainly;—Messrs. Carter, Gummow & Co. tendered to do the work originally at 28½ per cent. below office values; they then substituted a plan; if you had had the quantities of that substituted plan before you, and you had known that those quantities were to be paid for at office values instead of at the rate of 28½ per cent. below those values, would you have agreed to the proposal under those circumstances? I do not know whether I should have done so or not. It depends upon how the prices were to be made out; upon how they would work in. For instance, the material of the concrete would be different, and that item would be of a different value.  
 2105. Supposing that the material of the substituted arches was not of a much greater value? I suppose they would be, because I understand that a larger proportion of cement is used in connection with the Monier system than is the case in ordinary concrete.  
 2106. Presuming that there had been placed before you an estimate of quantities and valuations showing a great reduction, would you not have thought that there ought to be a corresponding reduction in the contractor's tender. If you had a contract before you upon which a contractor had undertaken to do work at 28½ per cent. below your computed values, and if there were a substituted scheme, portion of which contained something else, would you, as regards the substituted portion, pay the contractor the values you had put upon the whole of the original work? In making a substitution I should arrange probably that the prices only in that part which was substituted should be affected.  
 2107. That would be a proper thing for an engineer to do? That would usually be done.  
 2108. You would not consider that, as regards those parts not affected by the substitution, you would be justified in paying 28½ per cent. above what the contractor wanted? Unless there were some very good reason for doing so, I certainly should not.

2109. If you had known that that had been the case as regards the prices for the Monier arches you would not have agreed to the proposal? I understood that there would be a saving upon the total cost.

2110. Mr. Hickson did not take you into any quantities; he did not produce Mr. Bagge's report? No.

2111. Do you not think it would have been as well to have the quantities of the Monier arch taken out before submitting the proposal to the Board of Reference? I scarcely think it was necessary.

2112. On what basis, then, would you proceed? I should go upon general experience in the matter. Speaking for myself, my feeling was this—I was glad of an opportunity to see the principle tested. The reduction in price did not seem a very large one; still in testing a new principle you cannot expect to get in the first instance so large a reduction as you would probably get afterwards. If the principle were once tested, and if it proved satisfactory, no doubt a large saving could be effected in the future. I understand that this patent was in the hands of these particular contractors. It was therefore a question of dealing with them. The work could not have been done by open tendering, so that the conditions were quite different from those which you would have in connection with an ordinary contract.

2113. Is it a wise thing for the Government to adopt a patent the value of which is untested in connection with so large a work as this? I do not refer to this contract as being a testing of the value of the principle, because there was no doubt in my mind that the principle was a good one. It had been adopted with very great success upon the continent, and I believe it is now being received with some favour in America. I meant the testing of the principle as to its commercial value—the possibility of carrying it out commercially with a certain profit.

2114. If you were testing the principle commercially you would want to ascertain the cheapest article, combined with the greatest durability? Yes.

2115. Then, upon that standard, what test could there be when, upon so large a work, the cost was only £250 less? There would be the test as to whether it could be carried out effectively.

2116. Why should you enter into so great an experiment as that;—why could you not take a smaller case in order to test the principle, if that were the reason? That would involve a certain amount of delay.

2117. A contract was being carried out under Mr. M'Sweeney, on a plan somewhat similar, for an equal amount of money;—would it not have been wise to wait a little while, in order to test whether or not the other scheme was equally cheap? I was perfectly satisfied to accept the proposal.

2118. You had no really strong ground for accepting it? Well, I saw that there might be a great saving in the future. There was a small saving in this particular case. If it had been higher, I should have objected to the experiment.

2119. If you wanted to make a test, why not effect a saving? You could not tell exactly what the system would cost in the Colony, because you could not under the circumstances call for tenders for the particular class of work.

2120. *Mr. Smith.*] I think you were asked whether you had or had not any strong grounds for recommending the acceptance of the tender? Perhaps my answer to the question scarcely conveyed what I meant. I did not, perhaps, properly catch the question. I think the saving which there might be in the future would be a strong ground for accepting the tender.

2121. You also thought that there was a good opportunity for the introduction of a system which you had satisfied yourself was a sound one? Yes.

2122. The report of the 20th March, 1895, of the Board of Reference, correctly states what took place at the meeting of the Board, does it not? Yes; I have not altered my opinion about the matter at all. In fact, it has been rather strengthened than otherwise as regards the advisableness of adopting the principle. The report is a correct account of what took place.

2123. And you say you have not altered your mind since? No.

2124. You are perfectly satisfied with the advice given by the Board of Reference? Yes.

2125. I suppose the whole matter was very fully and carefully considered at the meeting of the Board? It took some little time; we all understood Mr. Hickson's views upon the question, and we coincided with them, as you will see by the minute.

2126. The Board were unanimous in their recommendation? Yes.

2127. When you accept a lump sum contract, I suppose you have afterwards to make out a schedule or something of the kind in order to ascertain what your progress payments are to be? Yes.

2128. That would be a matter to arrange after the contract had been signed? Well, in the case of my work, I have a schedule attached to the contract; it is chiefly for additions and reductions. I believe it is the practice in the sewerage branch to have a schedule attached to the contract. The contractor puts in his schedule of rates, and the contract is accepted according to the lump sum, but if the quantities worked out at those rates come to a larger amount than the lump sum, the contractor is expected to reduce the rates accordingly.

2129. So that he will receive payment at the lower rates? Yes.

2130. *Mr. Gummow.*] You were asked whether, if you had a contractor doing a certain work, and you wished to substitute other work, you would pay him for the whole contract under the substituted rates, or whether you would alter only the rates for the substituted part? Yes.

2131. Do you consider a tenderer putting in a lump sum price for a certain way of doing a work, and putting in a schedule rate price less a certain percentage—do you consider those parallel cases? It is not exactly a parallel case.

2132. *Mr. Smith.*] In regard to this Monier system, it involves special kind of work? Yes.

2133. Therefore, it does not follow that because the quantities of the portion of the contract upon which the Monier system is used might be less than the value of the work might not be greater than under the original plan;—what I mean is, the quantity is not the true test of value? No, because the items may be higher in price.

2134. When work is done under the Monier system it might involve a higher price than would the same quantities under the ordinary system? That is the case, especially with regard to concrete, which in one case contains much more cement than in the other. Under the Monier system it is not concrete in the proper sense of the word. Concrete contains sand and broken stone or gravel. In the case of the Monier system it is more of the nature of mortar.

2135. *Mr. Parkes.*] If special bluestone concrete is worth £3 per yard, a fair value relative to that for compo. would be £3 10s., would it not? It would depend upon the proportion of bluestone in the concrete.

H. Deane.  
8 June, 1896.



WEDNESDAY, 10 JUNE, 1896.

Frank Moorhouse Gummow sworn and examined:—

- F. M. Gummow.  
10 June, 1896.
2136. *Mr. Parkes.*] I notice that on 3rd April, 1893, you, under the name of Carter, Snodgrass, and Baltzer, as patentees of the Monier system, offered the patent to the Government? No. (*Vide Appendix No. 7.*)
2137. But your agent, Mr. Armstrong, did so? No.
2138. It was not offered to the Government by you? No.
2139. Was not Mr. Baltzer an officer of the Department at that time? He was.
2140. At the time he was a co-patentee with you? I did not enter into this patent until last year. Prior to that I had nothing whatever to do with it. I am not sure when Mr. Baltzer left the Department, but I became a shareholder in the patent about March or April of last year.
2141. No doubt he is identical with the gentleman who was in the Department? Yes.

William Darcus sworn and examined:—

- W. Darcus.  
10 June, 1896.
2142. *Mr. Parkes.*] What is your occupation? I am a carpenter.
2143. You were in the year 1894 in the employ of Carter, Gummow, & Co.? Yes.
2144. As a sort of foreman upon Contract 69? Yes.
2145. While you were foreman upon that contract you had, as well as making the moulds and doing other carpentering work, to do some cementing work at various times, had you not? I never had to do any cementing work, but I had to set off nearly all the excavation work upon that job.
2146. You noticed the quality of the concrete which was used upon that contract, did you not? Yes, many times.
2147. Will you say how it was mixed? At times it was mixed very carelessly. The correct quantities were not put in. The correct quantities would be 16 of blue metal, 8 of sand, and 4 of cement, but those quantities were not mixed. The mixing was done very carelessly.
2148. Did you at one time apply that better material must be put in. Yes; I had some very difficult work to do. I had to construct some arches which had to carry a very great weight, and I was afraid they might give way.
2149. Was the material bad? I did not consider that it was good enough, and I applied for better.
2150. Did they send it to you? They laughed at me.
2151. In a job of such an extent as that, where something like £15,600 is paid for concrete, I suppose the mixing of the concrete in the way you describe would make an enormous saving? If all the concrete were mixed in that way. But I could not say that that was the case—in fact, I am certain that it was not.
2152. Did you see any considerable quantity mixed in that way? No; what I saw mixed in that way was at the Premier-street shaft.
2153. Did you see any of the other shafts in construction? I supervised the construction of them all on this particular job.
2154. And the concrete you have just described was the worst you saw? Yes.
2155. You had, in the discharge of your duty, to measure and set off the work upon this contract, had you not? Yes.
2156. You have before you the contract plans of Contract 69; I suppose you understand them thoroughly? Yes.
2157. Will you look at drawings Nos. 3 and 4, including the plan of the chamber in Premier-street? Yes. (*Vide Appendix D.*)
2158. The original contract plans provided for a very elaborate spiral staircase? Yes.
2159. And a very large chamber and shaft? Yes.
2160. This work was excavated to a great extent? It was all excavated with the exception of the spiral staircase. All the rest was excavated, but it was known that the spiral staircase would not be made.
2161. When the plan was altered the small chamber represented in the drawing No. 4A was substituted? Yes.
2162. When that drawing was substituted the spiral stairways of stone were taken out and iron ladders were substituted in a comparatively small shaft? After the excavation for the larger chamber, not including the stairway, had been made it was found that a great deal of space had been shot out which had to be filled in with concrete. The ground had been shot out, and when the altered plan came in of course it had to be filled in.
2163. What then took place? The excavation was filled in with concrete, and the contractors I suppose were paid for the excavation and for the extra filling.
2164. To any great extent—would it go into hundreds of yards? I could not say until I went into figures. I should have to take measurements from the plans.
2165. Would it go to hundreds of yards? I dare say it would. Quantities could easily be taken from the drawings.
2166. At all events, there would be an enormous increase? Yes.
2167. And all to the advantage of the contractors? Yes.
2168. Do you know if any reduction was made for this substitution? I do not think any reduction would be made. The contractors I am sure would not permit it.
2169. Had you to do with the making out of the final quantities? I had not, but I made out quantities for members of the firm who have since left it, for their own private information.
2170. You cannot give us information upon your own knowledge as to whether the shaft of which you speak was paid for at the original prices with the addition of the concrete? I could not say. I had no knowledge of that.
2171. Turning from that to a siphon which was to be built in the sewer—you remember that? Yes.
2172. *His Honor.*] On what plan would that be shown? On drawing 14. An alteration was also made there.
2173. For 10 chains from Premier-street to the Illawarra Road there had, according to the original contract, to be duplicate sewers? Yes. (*Vide Appendix D.*)
2174. And it was found that considerable saving could be made by increasing the size of one sewer and doing away with the other? By substituting one sewer for two—yes.
2175. The whole of the necessary excavation had been done beforehand? Yes.



W. Darcus.  
10 June, 1896.

2176. And when the alteration was made that excavation had to be filled in? Yes; the filling is shown here on the plan.
2177. That would also entail a great deal of extra cost? Yes.
2178. And that filling was paid for at the rate of 5s. per yard? So far as cost is concerned. Of course I cannot be sure whether the building of the one channel was more expensive than the building of the two. I should have to take out the quantities.
2179. But the alteration did take place? Yes.
2180. And you consider that it was to the advantage of the contractors? Yes.
2181. You say the siphon to which you have referred is shown upon drawing No. 14? Yes. (*Vide Appendix D.*)
2182. There was some defective work there, was there not? Yes.
2183. Will you explain what it was? It was on the Illawarra Road. The pipes were put in much below the penstock chamber. My duty was to build this chamber, and when I came to put in the chamber I found that the pipes were out of the line of the main sewer. I had then to build the thing up as best I could. We had to bend the main sewer round so that it would come in.
2184. Do you consider that a defective job? Yes; anything, I take it, which would impede the flow of the water would be defective.
2185. Would this defect you are speaking of impede the flow of the water? It is bound to do so.
2186. Was the work reported to the inspectors as defective? Yes; two of them were there with the engineer looking on, and they approved of the way in which I did the job.
2187. What engineer would that be? I think Mr. Gibbs. The same thing took place at the inlet of the siphon.
2188. Instead of taking up the pipes, this botched work was done? Yes.
2189. *His Honor.*] What amount of deflection would there be? I suppose there would be about a foot.
2190. Do I understand that the iron pipes are put into concrete? Yes.
2191. You said just now that you had to bend the sewer;—how did you get the curve in the iron pipes? We did not get any curve in the iron pipes, but an alteration was made in the concrete barrel.
2192. Then you must have cut away the concrete? Yes.
2193. The concrete was set at the time? When I was setting the pipe I discovered that it was out of line, and what I did was to make it fit as well as I could, with the approval of the engineer and inspector. You will see from the plan that there is a sliding-door to the penstock chamber, and you will see from that that the work had to be very exact to permit of the mechanism of the sliding-door working properly.
2194. *Mr. Parkes.*] What do I understand you to say was done at the siphon? The concrete approaching the iron pipe was cut away.
2195. That would have the effect of pinching the neck, would it not? Well, the water would not flow straight, of course.
2196. On one occasion you had a conversation with Mr. Snodgrass? Yes.
2197. In connection with some centerings? Yes.
2198. Could you fix the date? No; I keep no diary.
2199. *His Honor.*] Can you not fix the spot, and give us the date as nearly as possible? The conversation took place in the carpenter's shop on the Marrickville Road, near the entrance of the "Empress of India Hotel."
2200. Do you remember in what month it was? I could not say.
2201. *Mr. Parkes.*] What was the conversation? It was with reference to the centerings cancelled on account of the alterations which had been made. Mr. Snodgrass told me to give him a valuation of the centerings, and to be sure to put in a good price. I gave him the correct valuation. It was something like £5 or £6.
2202. What did Mr. Snodgrass tell you to do? He expected me to put on about twenty times the amount. I said, "That is the correct thing; you can do the rest."
2203. He wanted you to put on about £100? He did not mention a sum, but he wanted me to put on far more than the correct value.
2204. But you gave him the correct amount? Yes.
2205. These centerings are charged for in the general account? They must be.
2206. You noticed in the construction of these sewers the sinking of sumps under each shaft to take the drainage from the subducts? Yes.
2207. The filling in that case was to be with concrete? Yes—sandstone concrete.
2208. Did you notice how these sumps were filled in? Yes.
2209. How were they filled in? They used everything they could get their hands on to fill them in with.
2210. Did they use cement-casks, for instance? Well, I saw lumps of wood used.
2211. Rubbish of every sort? Yes.
2212. And they charged for that as concrete? I do not know whether that is so or not.
2213. They were supposed to be filled with concrete? Yes. There was always some concrete put in them.
2214. Did it ever occur to you to report these matters? No, never; it was not my business.
2215. Where was the inspector while this work was going on? He would be looking after some other part of the work, I suppose. The inspectors have a good deal to do.
2216. The inspectors attended to their duty, you think? They did.
2217. Did you ever have a conversation with the man who drove the engine at the shafts? Yes.
2218. What did he tell you? He told me a lot of things I could not believe. I did not think there would be so much villainy connected even with this firm.
2219. What is the name of that man? Thomas Odgers.
2220. Where is he now? In Coolgardie.
2221. Do you know anything about the brick lining of this sewer? Yes. I made all the centerings for it.
2222. Is the greater portion of it two-ring or a single-ring? The greater portion is single-ring. Of course it depends upon the nature of the ground. Wherever the nature of the ground necessitated it double-ring work would be put in.
2223. You made centerings for the sewer all through? Yes.
2224. And you naturally would pay attention to the size of the excavation, would you not? Yes.
2225. The sewer is large at one end, and is small at the other? Yes.

- W. Darcus.  
10 June, 1896.
2226. What would be the average size of the excavated passage? There are so many different sizes of sewer that it would be difficult to strike an average.
2227. The sewer ran in size from 6 ft. 8 in. x 7 ft. 8 in. down to 3 ft. 3 in. x 2 ft. 2 in.? Yes.
2228. What was generally the room which would be left for packing? The ground was got out as nearly as they could get it to the size of the sewer.
2229. In some cases the ground was bad? Yes.
2230. Was it very wet ground? It was wet. The underlay was of a soppy nature, and there was a good deal of shale.
2231. From the inner line of the periphery would there be an average of more than 2 feet taken out? Not so much as that, I think. It might average (say) 1 foot. You will see from the rough drawing I have made the approximate size of the excavation.
2232. Measuring from the inner periphery? Yes.
2233. That would be right through the sewer? Yes.
2234. Then the packing would run at that average? I suppose it would.
2235. What was the date of the completion of the drive and shafts? I cannot give you that date.
2236. When did you leave the job? I think in about August of last year.
2237. Would the drives and shafts be completed in July of last year? Yes; I think they were completed in July, but there would be a good deal of rendering to be done. The brickwork and concrete were all in.
2238. Had you been a clerk of work of the Government what would have been your opinion of this work? I would have condemned two-thirds of it.
2239. *His Honor.*] What parts of it would you have condemned? I would have condemned, for instance, the concrete in the Premier-street penstock chamber.
2240. *Mr. Parkes.*] What was the nature of the work? Well, if I had been Government inspector I would not have permitted it to go on.
2241. In what respect was the work defective;—was the material bad? The material was good, but the proportions were all wrong.
2242. What would be the proper proportion? Sixteen of blue metal, 8 of sand, and 4 of cement.
2243. What proportions were put in? I could hardly say the exact quantity. It was shovelled in anyhow.
2244. Was there any gauging? Well, the gauge-box would be left and the man would continue to shovel on until the box took the shape of a pyramid.
2245. *His Honor.*] You mean in the gauging of the metal, of course? Yes—the metal and the sand.
2246. Putting in an excess of metal and sand over the proper proportion to the cement? Yes.
2247. To what extent was that done? As I only saw them doing it now and again I could not say to what extent. I did not pay much attention to it. I was an employee of the contractors; they paid me, and it was to their benefit that I should pay no attention to what was being done. At the same time I knew what was going on.
2248. *Mr. Hickson.*] Could you fix the date of the bad work in connection with the siphon? I can fix no date.
2249. Who were the inspectors on the job? Messrs. Tudgay, Husband, and Eyre.
2250. Who were the engineers in charge? Mr. Millner and Mr. Gibbs.
2251. Who was the supervising engineer? Mr. Davis, I think, part of the time. I forget the name of the gentleman who came after him.
2252. When this bad work was done who was in charge? The gentleman who came after Mr. Davis.
2253. You appear to have been over the work from one end to the other;—you appear to have been at the mortar-board when the mixing was going on, and you appear to have been down below, and I want to know how you came to be in all these places at the same time? I did not say so. I was at one of these places at one time, and at another place at another. I did not live down the shaft; I had to come up sometimes.
2254. In regard to the mixing of the concrete, you say that you only estimated that the proper proportions were not put in; you did not know, as a matter of fact, whether the proper proportions were put in or not? No; but I stood by, and I saw the extra stuff thrown on to the board.
2255. When? I have no dates. I did not expect to be examined in regard to the matter, but I know that the thing was done on several occasions.
2256. What were the names of the men who were doing this? Messrs. Carter, Gummow, & Co. could easily give you the names.
2257. But I want the information from you;—you say you were a sort of foreman on the work, and of course you would know the names of the men? Martin Byrnes was one of them.
2258. He was one of the men who were mixing the concrete in the manner you have described? Yes. The other man I only knew by his Christian name—Tim. The contractors know his surname well enough.
2259. You mentioned some defective work at the dome where the three sewers branch off at Premier-street? I had occasion to speak to the men who were mixing concrete, and to ask them to send down better stuff.
2260. Who was the inspector then? Mr. Tudgay was the chief inspector.
2261. Who was the engineer? Mr. Millner.
2262. Who was the supervising engineer? Mr. Griffiths.
2263. You mentioned, I think, that a good deal of money was put into the contractors' pockets by the substitution of one sewer for two? I said there was an alteration.
2264. Do you know, as a matter of fact, that there was a considerable saving on the adoption of that plan? I do not know what you would call a considerable saving.
2265. Suppose there were a saving of £10,000? I do not think there was.
2266. Are you sure there was not? I am.
2267. You are quite sure there was not a saving of £10,000 effected by the alterations in the sewer at Premier-street? A saving to whom?
2268. To the Government; I understood you to say that money was thrown into the hands of the contractors on account of these alterations; presumably, therefore, the Government had to pay something extra; in other words, you say there was no saving to the Government by the alteration? There was no saving to the Government, in my opinion.

2269. As a matter of fact, there was a considerable saving to the Government which you apparently know nothing about? I know nothing about any saving. The plans show where the alterations were made, and the excavation was done before the altered plans were handed in to the contractors. These excavations had to be filled in again with concrete. W. Darcus.  
10 June, 1896.
2270. You would be surprised to hear that a saving of about £10,000 was effected to the Government by the alteration? I should be surprised.
2271. *His Honor.*] You do not know anything about the arrangements made between the Department and the contractors when these alterations were made? No.
2272. There may have been any arrangement for aught you know? Yes.
2273. *Mr. Hickson.*] Why do you think the contractors made a considerable profit at the expense of the Department? From what I could see I thought that that was the case.
2274. It is a mere guess on your part? There is no guessing about it. The ground was shot away, and it had to be filled in with concrete.
2275. It is something like your guessing at the quantities in the concrete—this is simply another guess? I have just said that it is not guessing at all, because the excavation was made, and it had to be filled in.
2276. Did you mention this bad work to the inspectors? No.
2277. Did you mention it to the contractors? To one of the firm I mentioned it several times.
2278. Who was that? Mr. Forrest.
2279. What did he say? Nothing.
2280. You did not mention it to the Departmental inspectors? It was not my business to do so.
2281. I presume this work was done when the inspector's back was turned? Yes.
2282. Mr. Parkes referred you just now to drawing No. 3 among these plans;—do you know, as a matter of fact, whether that is part of the contract? I presume so, or the drawing would not have been handed to the contractors.
2283. What is the meaning of the word "cancelled" across the drawing? I never saw that before.
2284. It would appear that you have been speaking with reference to a drawing that does not form part of the contract? It was understood all along that the spiral stairway was cancelled.
2285. Supposing that was not the contract plan, would it not upset your evidence? No; the stairway was never made.
2286. You say that an alteration was made in the spiral stairway, and this had the effect of putting a lot of money into the contractors' pockets? I said no such thing. No excavation was made for the spiral stairway. The excavation to which I refer was quite independent of that.
2287. You see that the plan before you was cancelled? Only part of it was cancelled.
2288. Are you quite certain? Yes.
2289. Why? Because I had to do with the whole of the work. I had to make all the centerings and to set out the work so that the men might shoot away the ground and excavate.
2290. You are certain that the whole of this plan was not cancelled? Quite certain. Decidedly it was not.
2291. Are you still in the employ of the contractors? No; I have not been for some time.
2292. *Mr. Gummow.*] I think you said you were a sort of foreman;—were you a foreman for the contractors? I had charge of the work.
2293. Where were the contractors? They were there also.
2294. Did they not manage their own work? Mr. Ewing and Mr. Maddison both handed me drawings to see that certain work was done.
2295. They handed you drawings to make centerings from—drawings from which you could set up the ribs? And to set the ground out for excavation also.
2296. Had you any men under you to do that? Yes; I had any men I required.
2297. Who told you to set out the work? Mr. Ewing.
2298. Did not Mr. Maddison? Mr. Maddison was gone at the time the Premier-street dome was set out.
2299. Do you know young Mr. Forrest? Yes.
2300. Did you tell him last week that you had a set against the Government engineers and inspectors, and that you would make it hot for them? I did not.
2301. With regard to the fixing up of some of the work at the dome at Premier-street, you say you gave instructions to the men about sending down good material, and that they took no notice of you? I simply asked for better stuff.
2302. They did not take any notice of what you said? No notice whatever.
2303. Had you any right to tell these men what they were to do? I think I had.
2304. But had you, as a matter of fact? I am sure I had.
2305. Was there no one there in charge besides yourself? Mr. Forrester was there now and again, but he left the whole matter to me.
2306. Why did you not sack the men when they did not carry out your instructions? I had no power to sack any men or to put any men on.
2307. Had you power to order them to do anything? No.
2308. Do you not know that the whole of your contractors' foremen, if they have power to order men to do anything, have also power to sack them? I did not order the men in this case. I simply asked them for better material.
2309. Did you not say a minute ago that you had the right to order them? No. What I said was, I thought I had the right to ask them for better stuff.
2310. Did you ask the men at any other place to put in better material? No.
2311. How many of the heaped-up boxes of metal do you think you saw used in the concrete? I saw the heaped-up box used six or ten times.
2312. Can you swear that you saw it used ten times? I will not swear that I saw it used ten times, but I will swear that I saw it used five times.
2313. Where was that? At Premier-street.
2314. When? I can give you no date. It was during the course of the work.
2315. Can you not give us the date within a month? I can give you no date.
2316. Can you give us the date within two or three months? I can give you no date. It was during the course of the work.

- W. Darcus. 2317. What do you mean by the course of the work—extending over what period? During the time the work was being constructed.
- 10 June, 1896. 2318. What time was that? From March, 1894, till August, 1894, I think, but I will not swear to the dates.
2319. You cannot tell within a month or two? I cannot give you the dates, but it can easily be discovered when that work was going on.
2320. I understood you to say, at the commencement of your evidence, that you took measurements in connection with this contract;—who asked you to do so? Mr. Maddison.
2321. At what place? No. 7 shaft, Illawarra Road.
2322. Did he ask you to do so at Premier-street? He had nothing to do with the work at Premier-street.
2323. As to your conversation with Mr. Snodgrass, what value do you say you gave him for the centering? £5 or £6.
2324. Did that include the whole of the centering? It included the cancelled centering we were talking of at the time.
2325. You do not know, as regards the payment, what we received for centering? No.
2326. Do you know the exact size of the tunnel which was taken out? I know it pretty well.
2327. Do you think any part of the tunnel would be taken out larger than you indicated just now by your rough pencil sketch on the plan? It might be slightly larger.
2328. You are not sure whether it was not taken out square and timbered? Parts of it, where the ground is bad, would be taken out square and timbered. The drawing I made just now on the plan was intended to illustrate the taking out of the tunnel in rock.
2329. I thought you said that was a section of the tunnel approximately from beginning to end? That would be in rock. In soft ground, of course, the tunnelling has to be timbered.
2330. Do you know what it is packed with? It ought to have been packed with shale or with sandstone concrete where the engineer required it.
2331. Then the sketch you have made does not apply to the timbered ground? No.
2332. Can you give us an estimate of the quantity of excavation? No.
2333. Do you know how much of it would be timbered? I could not give you the quantity exactly.
2334. Could you give it approximately? No; I took no interest in the length.
2335. Then why did you say that it was on the average about 1 foot from the inside of the periphery? I meant that to apply to cases where the cutting was in rock.
2336. Then why do you not say so, instead of endeavouring to mislead persons? I am doing my best to give correct evidence.
2337. You assumed that the contractors were being paid for measurements which were not put in;—how did you arrive at that conclusion? To answer that question I should have to incriminate myself.
2338. *His Honor.*] You have already said that you were doing bad work without saying anything about it to the inspectors. I do not know that there is anything more in what you now wish to say? I did not consider it my duty to say anything to the inspectors, because I was employed by the firm of Carter, Gummow, & Co.
2339. I do not understand that your evidence would render you liable to any prosecution;—do you understand that it would? I do not know. Messrs. Carter, Gummow, & Co. are very vindictive people.
2340. I do not see how, as far as your evidence has gone, it would render you liable to prosecution. The mere fact of your having done bad work under instructions would not, as far as I could see, render you liable to be prosecuted? I did as I was directed by the contractors.
2341. *Mr. Gummow.*] You said that you did not remember anything about the times at which these things happened because you did not know that you were going to be examined about them? No.
2342. Did you know that you were to be examined upon any other points? No; I was summoned to come here when I had everything packed to go to Western Australia.
2343. Did you speak to any other men concerning this matter? To several men, I think.
2344. As to Messrs. Carter & Co. being so vindictive, in what way have they shown their vindictiveness;—do you remember the time when Messrs. Maddison and Ewing left the contract? Yes.
2345. Had you not your tools packed up ready to go the next morning when Mr. Forrest arrived? Yes.
2346. What did he say to you? That I was to go on with my work.
2347. Do you call that being vindictive? It was greatly to his interest to tell me to go on.
2348. In what way? I do not think he could have got another man at that time to carry on the work I was doing.
2349. Did the other sewerage contracts stop because you were not engaged upon them? No; but I had a thorough command of this particular work.
2350. Did Messrs. Carter, Gummow, & Co. not have other carpenters who were carrying on work of a difficult nature? Not so difficult, I think, as the work upon which I was engaged.
2351. Is this the most difficult sewerage work which has been carried out? The outlet at Bondi would be the only exception.
2352. You were not there, but I suppose the work was carried out all right? Certainly.
2353. If it was carried out all right, I presume men could be found to do the work? A carpenter was there, but there was an engineer to direct him.
2354. On this particular contract were Messrs. Carter and Gummow dependent upon you;—could they not have found an engineer? They could if they had liked, I suppose.
2355. Was there no engineer in the firm? I never saw one upon that job.
2356. You had the whole of the work upon your own shoulders? Yes.
2357. You say you worked under Mr. Snodgrass upon this job? Yes.
2358. Is he an engineer? I do not think so.
2359. Would he be capable of setting out this work? I have my doubts.
2360. Have you worked under him upon other contracts? Yes.
2361. Do you not know that he is a capable man, and could he not do all the measurements or anything that would be necessary on the part of an engineer? Not on the Marrickville job. He is supposed to be a capable engineer, but I know that he is not.
2362. Are you a judge of a capable engineer? I believe I am.

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2363. How did you come to assume that we were to be paid for work we had not done? I do not think I assumed that. It is a well-known fact that you would not do work for nothing.
2364. How did you come to assume that it was a gain to us to have this stairway of which you have spoken knocked out? I did not assume that. I do not know how it came to be knocked out.
2365. Did you not say that the knocking of it out would be a benefit to the contractors? No. My answer referred not to the knocking out of the stairway, but to an alteration in the shaft.
2366. How did you arrive at the fact that that would be of benefit to the contractors? Because they were paid by the cubic yard for excavation and for concrete.
2367. Are they paid for what they do not put in? I do not know. They may be.
2368. You do not know? I know nothing whatever about their payments.
2369. The measurements you made up were for whom or for what purpose? For the information of two members of the firm, who could get no satisfaction from the clever members.
2370. Who were they? Messrs. Maddison and Ewing. They came to me and asked me to make out quantities so that they might know how many cubic yards of concrete were going in. They appealed to Mr. Snodgrass, and he would not tell them at all. Then they asked me to do the work, and I did it.
2371. You were to assist them, because they were so ignorant? That is putting it rather roughly.
2372. Could they not have done it for themselves? No.
2373. Then it comes to this: you were to assist them because they were ignorant, whereas the clever members of the firm could have done the work without your assistance? I suppose so.
2374. Why could not the men to whom you refer have got the information from other members of the firm? They asked for it, and were refused it.
2375. You acted as their engineer—as a sort of spy? I was no spy at all, and I defy you to prove it. I acted just as I was instructed by Mr. Maddison.
2376. *Mr. Parkes.*] Will you look at Drawing No. 4? Yes.
2377. Is it not a signed contract drawing; is it not a drawing you have often seen? It is a copy of the drawing.
2378. But is it not the same drawing? I do not think it is.
2379. Another drawing to which you referred is marked No. 4A? Yes.
2380. Is not the Drawing 4A the one containing the alterations upon Drawing No. 3? Yes. [*Vide Appendices D and No. 8.*]
2381. Would not the work shown there have been just as complete and sound if it had been filled in with any other material such as filling at 6d. per yard instead of with expensive concrete? Provided a good wall of concrete was made over the arches and up the shaft. The other space might have been filled in with filling at 6d. per yard, and the work would have been just as good.
2382. *His Honor.*] What did you mean by saying just now that you might have to incriminate yourself if you answered a question which was asked you by Mr. Gummow;—you did not appear to complete your answer to the question? I was going to say that I was one of the men who took the measurements at Premier-street. The measurements were taken with a rod 7 feet long marked 5 feet and 2 feet. The measurements were taken from the ribs to the dome. I would hold up the rod, calling out 9 feet, 8 feet, 7 feet, without measuring the distance between the end of the rod and the dome correctly. The measurement was carried on under great difficulties. It was a dark, wet place, and it was very difficult to stand. To obtain the measurements accurately, we should have had to build a scaffolding. As it was, I got up on to the ribs and held up the rod to the rock, and a man in the dry tunnel would write down the measurements as they were called out.
2383. That would be the Government engineer? Yes.
2384. Would he not check them? There was an inspector half-way up the ribs assisting us to take the measurement. He had a candle, and sometimes through water falling it would go out, and it would be impossible then to see whether the measurements were correct or not.
2385. You took the measurements, whether in the light or in the dark? Yes. I had a 3-foot rule and sometimes put it to the end of the rod, and would call out whatever I thought were the measurements.
2386. Do I understand you to mean that you took the measurements careless as to whether they were correctly taken, or that you took them wrong intentionally? I took them carelessly.
2387. On the whole, do you think you arrived at a fair general average, or do you think you exceeded it? I think I slightly exceeded it, but not much.
2388. Having regard to the conditions under which the measurements were taken, are they as good an approach to correctness as could be arrived at or not? We should have had to build scaffolding to get at them correctly; but we did not wish to take them correctly.
2389. The measurements were taken in the way you indicate to avoid trouble and loss of time? Yes.
2390. *Mr. Hickson.*] Who were the men engaged with you in taking the measurements? The labourers who were there; also Mr. Tudgay, the inspector, and Mr. Gibbs, the engineer.
2391. You are referring to the measurements at the Premier-street dome, I understand? Yes.
2392. *Mr. Gummow.*] Was the approximate way of taking the measurements your own way of taking them, or were you told to take them in that way? Mr. Snodgrass informed me that I was to make the best of it.
2393. In measuring holes in roof excavations you can easily measure 6 inches more or less if it is a very large excavation? Yes.
2394. For instance, could you say whether 2 or 3 inches this way or that, as the case might be, would be the more correct measurement to give;—speaking generally, is not the whole thing an approximation;—when all is said and done, could it be otherwise than approximate in very rough ground? I could have taken the measurements more accurately if I had been inclined.
2395. Could you get as absolutely correct measurements as you could get between timbers? No. In some cases the holes would be 6 feet.
2396. Did you take the measurements all over the dome? I measured when I got an opportunity in the deepest holes.
2397. Were there any deep holes you did not measure into? I measured all the deep holes I could get the rod into.
2398. Did you measure anyhow—that is, all over the place, or did you have a fixed idea? There were certain points given to us to measure from.
2399. *His Honor.*] By whom were these points given you? By Mr. Snodgrass. He mentioned that the measurements

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- measurements were to be taken at certain angles round, and the circular ribs were set up as a guide. They could easily make the calculation inside the circular ribs, but they wanted it made outside.
2400. *Mr. Gummow.*] Mr. Snodgrass was your boss, was he not? No.
- 2401-2. He was one of the contractors, was he not? I am not sure. He is very seldom there.
2403. Did he not, as a matter of fact, settle the distances at which you were to measure the excavation to which you have referred;—supposing this room to be the excavation, was it not divided up into sections of 5 or 6 feet, and did you not measure from those sections up to particular points? It was not done in that way.
2404. Did you not, in going round the circle, take the measurements from certain points right round? I took the measurements as nearly as possible in radial lines.
2405. Having measured at one point, you would go a distance of 5 or 6 feet and take another measurement? Yes.
2406. There was a certain fixed method laid down upon which you made the measurements? Yes.
2407. It was not for you to go where you liked all over the dome and pick out the holes? No.
2408. You made the measurement from ribs fixed at certain distances apart, and your measurements from those ribs had to be taken by the Government and the contractors? That was the method adopted if it had been correctly carried out.
2409. You were not to pick out all the big holes and put your rod into them? I did, though, all the same. While I was employed by the firm I did my very best to further their interests, and I thought I was furthering their interests by giving them as much measurement as possible. If I got the opportunity to put the measuring rod into a deep place at a given point I did so.
2410. *His Honor.*] Was that done at their instigation, or was it your idea of your duty to your employers? The firm never instruct their men to cheat.
2411. What you did was your idea of doing your duty to your employers—the idea, for instance, which sometimes leads seamen to swear that lights were burning brightly? That is the case.
2412. *Mr. Gummow.*] Should you not think the firm must be losing very heavily now by not employing you? No; and I think that is an insolent question.
2413. *His Honor.*] How did you come to leave the firm? I had finished the work upon which I was engaged.
2414. You were not dismissed? No.
2415. There was no dispute between you and your employers? None whatever.
2416. Is the contract upon which you were doing the work you have described finished or not? I think it is finished.
2417. *Mr. Parkes.*] Do you mean to say that you made the extra measurements you had described of your own free will? I would rather not answer that question.
2418. *His Honor.*] It is a most important question, and you must answer it—the question is whether you made these measurements of your own free will without the knowledge or consent of the contractors? I have already said that Mr. Snodgrass told me to do my best for the contractors.
2419. Then you were under the impression that you were empowered and expected to do this work, were you? My impression was that I was to do my best for the contractors, and that was my method of doing it.
2420. *Mr. Parkes.*] Did you think you might not be kept upon the work if you did not do these things? I do not know about that.
2421. *Mr. Hickson.*] Was Mr. Snodgrass present when the measurements to which you have referred were taken? He was below on the floor of the dome.
2422. Did he direct you to put your rod into the holes? No.
2423. You did it of your own free will? Yes.
2424. *His Honor.*] In making the measurements the rod was supposed to be perpendicular to the particular part of the ribs from which the measurement was being taken? Yes.
2425. And the ribs were marked off at regular intervals to show you where the measurements were to be taken from? Yes.
2426. The rod was supposed to be long enough always to reach from the ribs to the roof? Yes.
2427. But occasionally you would find that the roof had been blown away too much, and in those cases you would have to guess the measurement? Yes.
2428. You used a 3-foot rule on the foot of the rod at places? Yes.
2429. And I understand that sometimes you simply guessed the measurement, and at other times you put the rule on? Yes.
2430. The light, you say, was bad? Yes, and I had a dangerous place to stand upon.
2431. What were you standing on? On the lagging.
2432. You were in rather a shaky position? Yes.

Thomas Wright sworn and examined:—

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2433. *Mr. Parkes.*] What is your calling? I am a carpenter.
2434. Were you employed at any time by Messrs. Carter, Gummow, & Co.? Yes.
2435. For any length of time? For some months; I did not take much notice of the time.
2436. Upon what jobs of theirs were you employed? At North Shore, Woolloomooloo, and Alexandria.
2437. The Alexandria job would be where the sewer runs through Alexandria Park? Yes.
2438. Your duty as a carpenter was to make the moulds on which the concrete sewer was built, is that so? Yes.
2439. *His Honor.*] Is that a branch sewer from one of the main contracts? It is a storm-water sewer.
2440. You are familiar with the section of sewer shown upon drawing No. 1, Contract No. 61, before you? Yes. [*Vide Appendix E.*]
2441. What you might call the invert of that sewer would be 9 inches of concrete as shown upon the plan? Yes.
2442. When you made those moulds what did you discover in connection with the concrete? I found that we could not get at places more than 3 inches or 3½ inches.
2443. Would that be throughout the sewer? It is now five or six years ago, and it is difficult to speak exactly

exactly as to the quantity, but there might be 30 or 40 feet to which that would apply. I know that I wrote to Mr. Davis the engineer about the time the thing occurred, but he never answered my letter.

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2444. Did you do all the centering upon this job? Yes.

2445. Beyond the 30 or 40 feet you have spoken of, was the work good? I daresay it would be near enough in places, but the material was bad.

2446. In what way bad? Condemned cement was used. I have known cement to be put into the work which would set in fifteen minutes. Mr. Davis and Mr. Snodgrass both tried the cement, and were satisfied that it was bad.

2447. Was it condemned by Mr. Davis? I think it was. I cannot be quite sure, but I think he condemned it. They had other casks of good cement upon the ground, and some of this cement which they knew would stand the test was sent in. Word came back that the cement was good, and I know for a fact that the cement which had been formerly condemned was used.

2448. Did you write to Mr. Davis and point that out? Yes; after a dispute, which subsequently took place at North Shore, with the contractor.

2449. You wrote to Mr. Davis about this job then? Not this job more than any other upon which I had known of defective work.

2450. Was cement being put into this No. 61 job at the requisite gauge? Some of the gauges would go as far as 30 feet. Now, a gauge of concrete, if the metal is good, will go about 20 feet. The proportions are 16 of metal, 8 of sand, 4 of cement. When these proportions are properly mixed up a gauge will go about 20 cubic feet, but, in this particular case, I have known it to go over 30 feet, because the material was bad.

2451. What you mean by that is they put in too much metal? The metal was not the right sort of metal. It was too fine. It was more like sand. I think I can safely say that sometimes the bankers would measure over 30 feet, and a cask of cement is supposed to go to every banker.

2452. That means that the quantity of cement used was short? Yes.

2453. *His Honor.*] In other words, the metal lay too close; and when you were measuring, if you had taken the weight of a cubic foot of metal you would have found it greater than it ought to have been, because there were fewer interstices? Yes. The metal we had from Kiama would run 20 feet to a cask of cement, and the metal which was crushed at Newtown would go about 21 feet, if the work had been done honestly, merely because the stone was flatter.

2454. If it had gone 21 feet it would not have been a bad job? No.

2455. How do you account for its going 30 feet? The metal was bad.

2456. Where was the metal obtained from? Newtown.

2457. Crushed how? I do not know.

2458. Had they a crusher, or was it crushed by hand? It was crushed by machinery, I think.

2459. Could you put your hand upon where the defective work is in the invert of the sewer? No, not very well. It has all been covered up. Commencing at the end where we finished in the Chinamen's gardens, near Alexandria Park, I should say you would find the bad work within about a foot of the end.

[*Vide Appendix E.*]

2460. *Mr. Parkes.*] You do not know what street that would be near? No; but I believe you would find the work starting there at about a foot from the end. You would find that the concrete there is only 2 or 3 inches thick.

2461. *His Honor.*] That is in the invert? Yes.

2462. Is there rock underneath? No—sand.

2463. *Mr. Parkes.*] If the invert of the sewer is 9 inches, and if the sewer is 7 ft. 6½ in. by 7 feet, there would be a large saving, would there not? Yes; I thought many times that there was £100 saved in that little place to which I have referred. When the work was open I could have shown it to you easily enough, but it would be hard to find it now.

2464. You knew of this bad work by testing it yourself? Yes.

2465. As you went down the sewer, did you have to drive the peg down at any place? I should say that at least thirty or forty pegs had to be shifted? I cannot say the exact number, because the thing happened five or six years ago.

2466. What you mean is that the pegs were put up in the first place to show a gauge of 9 inches? Yes.

2467. And to get in your moulds to construct the sewer you had to drive these pegs down to 3 inches? Yes; we had to go down to get the grade. The concrete is supposed to be put in at the bottom in two layers—one of 4½ inches, and the second 4⅜ inches, ⅝ inch being allowed for rendering. When I came to set my moulds I had not room for half the thickness, and I had to pick it away.

2468. Even for the first 4½ inches? Yes.

2469. *His Honor.*] You say you had to drive the pegs down to 3 inches in some cases? Yes; I do not suppose there would have been even that much in some places. There was no room for the second layer at all.

2470. A mistake was made originally in the calculation? I could not say where the mistake was made.

2471. You could not get your grade? No; we should have had to go up hill.

2472. You found a gradual sweep upwards? Yes.

2473. To get the proper thickness in the bottom the pegs swept upwards a little? Yes.

2474. The bottom layer was there before you went in? Yes.

2475. *Mr. Parkes.*] You also worked on one of the North Shore contracts? Yes.

2476. And you found defective work going on there also? Yes.

2477. Did you see it yourself? Yes. One-half of the cement put into that job was condemned cement.

2478. How did they manage to get it in? In this way—one dray would take six casks and another five. In the case of the six casks there were three of condemned and three of good cement. In the case of the five casks the good and bad cement would be in the proportion of three to two in alternate loads.

2479. Was the concrete in this case mixed in bad proportions, as you have described in the case of the former job? Yes; the metal was good enough though.

2480. *His Honor.*] What was there wrong in the mixing? The proportions were wrong.

2481. What contract are you now speaking of? No. 60.

2482. *Mr. Parkes.*] Upon the whole, was there very much defective work so far as the concrete was concerned? They were using bad cement all the time I was there.

2483. How long were you there? About two months. It might be more, or it might be less.

2484. Did you write to the Department complaining of this defective work? Not till after I had been dismissed from the works.

2485.



T. Wright. 2485. Why were you dismissed? Perhaps I had better explain. I was working there at about 4 or 5 o'clock one Saturday evening when the inspector came round with Mr. Forrest. Both of them were pretty well drunk.

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2486. *His Honor.*] What is the name of the inspector? Inwood. They had been boozing all day. That happened not one day, but almost every day. There was another inspector standing watching us all the time. Inwood raised his foot and drove it through the metal, and said, "This b— stuff will not do" and "That b— stuff will not do"; and went on for some time in that way. Presently I got angry and began calling him names. I afterwards put on my coat and went away home. The following Monday was a holiday. When I came back on the Tuesday Mr. Forrest came to me and said, referring to what had taken place on the Saturday, "This is going to be a bad job. We are going to put you away. You will have to go away. Perhaps, however, an apology will do." I said I would not make any apology. On the following morning Mr. Carter and Mr. Forrest came down to me, and Mr. Forrest said, "I am sorry we have to put you away, but we must do so. We are putting you off without a fault." I at once gathered up my tools and got my time and money and went. Before that, however, I saw Mr. Davis and he asked me what I was put off for. He said, "You are not put off; they cannot do that." I said, "But they have done it." He then wanted to know what I had been put off for. I told him that we had had some words. I went round two or three days afterwards to a room in the Works Department. Mr. Bagge, Mr. Davis, and Mr. Piper and several more were there. I wanted to say something more in reference to the matter, but they would not allow me to say a word. I did not open my mouth. When it was all over Mr. Davis turned round to me and said, "You had no business to interfere with the contractor when he said what he did." I was a little bit surprised at the time, and I said something about letting the cat out of the bag, and I added, "I will see you in the morning." He said, "I do not want to see you." On the following day I wrote him a letter, and I have received no answer to it from that day to this. Afterwards I told the Honorable John Davies all about it, and he said, "Give me a letter similar to that which they have put into the waste-paper basket." I gave him a copy of the letter I had sent to Mr. Davis, and when I saw the Hon. John Davies again he said, "You make application for a place, and you will get it." Before I could make any application Mr. Bruce Smith, who was Minister at the time, went away, and when he came back I tried time after time to see him, but could not do so. I also wrote on different occasions, but I could not get an answer. I do not know whether Mr. Davis is responsible for it or not, but ever since I have been deprived of the opportunity to get any work on contracts under the Department.

2487. *Mr. Parkes.*] You are confident there was bad concrete used upon job No. 60, and that the cement was bad? Yes; I am sure of that.

2488. You can swear absolutely that that is so? I can swear that the cement was bad. I remember Mr. Davis going over one day and getting it all carted away. He knows that what I am saying is true.

2489. Was this bad concrete being used during the time you were on the job? Yes; for weeks. The first day I was on the job I saw what was going on. The cement which was condemned was in a different sort of cask to the good cement. It was in a tongued-and-grooved cask, and anyone could tell the difference, therefore, between the good and the bad cement which was being used.

2490. You know, of your own knowledge, that this defective work was going on? Yes.

2491. Were you doing it of your own intention, or were you instructed to do it by anyone? Well, we had the cement there, and we had to use it. Mr. Forrest would come over, and would help to unload the cement himself.

2492. He assisted you, then, to a certain extent in putting in the bad work? Yes.

2493. You say that in some of the concrete there was not sufficient cement? That is so.

2494. Do you think the contractors knew that the concrete was being mixed without the proper proportion of cement? I do not know whether they knew it or not.

2495. Were you acting without instructions in what you did? Well, you go there; you see what you have to do, and you do it.

2496. Who gauges the material for the concrete? There is one man there purposely to do that. He was on the board, and did all the gauging.

2497. How would he gauge? Sometimes, if there was nobody watching, he would put in as much as he can get in. He would make the gauge of stone as big as he could make it.

2498. Would there be a contractor's manager at work on the contract? Sometimes there would be a foreman.

2499. You were explaining how the bad concrete was mixed? Well, there is a box which is supposed to hold 16 feet. If there is no one watching, the man would put in 2 or 3 feet more. He has to keep an account in his own mind of how he is going on with the box. Perhaps when night comes round he will know that he has used thirty casks of cement. He will be asked how much he has used during the day. He will then say that he has used forty casks, having used only the thirty, knowing that forty casks would correspond with the work which had been done. If he did not watch very carefully he would be bowled out, because anyone knows that one cask of cement if used in the proper proportion will only do so much work.

2500. *His Honor.*] Would there be no account kept of the number of casks in the shed (say) one morning, and the number there on the following morning? Well, there might be 200 or 300 casks in the shed.

2501. But no account is kept by the inspectors showing the number of casks which have been taken out? No. They take down whatever number they are told.

2502. Do I understand that the man who manages the mixing of the concrete is a sort of foreman, who would return what would appear to be the proper number of casks which had been used in proportion to the quantity of work done? Yes.

2503. How many times did you write to Mr. Davis about these matters? Two or three times.

2504. And you say he never replied to your letters? No.

2505. Have you since seen him in reference to the matter? I have seen him, but I have not spoken to him since he told me that I had no business to interfere.

2506. *Mr. Davis.*] Since 1891 I suppose you had mentioned these matters to someone else? I daresay I have.

2507. Have you spoken to Mr. Parkes about them? Yes, I saw him yesterday and told him.

2508. When do you say you told Mr. Parkes? Yesterday or the day before.

2509. Referring to contract No. 61, and to what you allege as to the bottom of the sewer at Alexandria— was it an accident or was it done purposely? I could not say.
2510. Did the inspector know that too little concrete was put in there? Yes.
2511. Did the resident engineer know? I cannot say.
2512. Which end of the sewer did you begin to construct? We began about the middle.
2513. With respect to the condemned cement upon contract No. 61, do you know of your own knowledge that condemned cement went into the work—are you positive on the point? I can swear it.
2514. What are your reasons for swearing that condemned cement went into the work; how do you know that the cement which you saw going into the work was condemned? When the cement was condemned word was sent out to the man in charge that it had been condemned. Every man upon the job would know of the condemnation. Of course I did not actually see the cement condemned.
2515. *His Honor.*] How do you happen to know what particular lot of cement was condemned? The cement is branded. We might get in on any one day 200 or 300 casks. A cask of it would be taken away to be tested and if it is condemned we would know that the whole of that brand was condemned.
2516. *Mr. Davis.*] Can you remember the brand of cement which was condemned in this instance? The "Lion" brand.
2517. Will you swear that the parcel of "Lion" brand which was brought on to the work was condemned, and that in spite of that it was put into the work? Yes.
2518. To what extent was it used? I could not say how much was used.
2519. Could you give us an idea of how many casks there would be likely to be in the parcel? I could not say. Sometimes I was at North Shore, and sometimes I was on the other job.
2520. There might have been only five? There might have been more.
2521. How many more? I could not say how many more, but there would be far more than five. If you had come out when I sent you the letter, you would have seen all that was being put into the work.
2522. Coming to contract No. 60, you and the inspector had rather a serious quarrel there, and the upshot of it was that an inquiry at which you were present was held? Yes.
2523. Unfortunately for you, you were sent away from the work? Yes.
2524. You were not satisfied with that? No.
2525. After that you wrote to the Hon. John Davies? No; I did not.
2526. When was the inquiry held? It was held the week after I was put off the job.
2527. Did you not write to the Hon. John Davies before that? I wrote to you two or three times, receiving no answer, before I saw the Hon. John Davies.
2528. Was it before or after the inquiry that you wrote to the Hon. John Davies? I did not write to him.
2529. What was the purport of your communication with him? I gave him a copy of the letter I had sent to you.
2530. What was the nature of the letter? I found fault with the material, and I also mentioned the way in which the men were drinking.
2531. Was not your letter to the effect that a certain inspector had been imbibing too freely? I told the Hon. John Davies of the matter in the street. I gave him a letter which he took to Mr. Bruce Smith. I did not write to him at all.
2532. After all this, did you apply for an inspector's position? No.
2533. Coming to this condemned cement which you say was used upon contract No. 60, can you give us any more definite information about that than you have given us about the condemned cement which you say was used upon contract No. 61? I know that it was condemned cement. I saw you standing beside me and allowing me to use it.
2534. How do you know that it was condemned cement which you used? Word was sent out that it was condemned. Mr. Forrest and Mr. Carter and everyone knew that the cement had been condemned, but they were all half drunk right through the place.
2535. You were the only righteous man there? I took it as well as the rest.
2536. *Mr. Gummow.*] Do you say that Mr. Carter was the worse for liquor? I never saw him the worse for it.
2537. Did you ever see him take any liquor? I did not.

Patrick Harford Kenna sworn and examined. :—

2538. *Mr. Parkes.*] Do you know a man named Christian Hansen? Yes.
2539. Will you tell His Honor the statement he made to you the day before he came here to give his evidence? On the occasion to which I refer, I was in King-street, Newtown, with him. We were talking over matters in connection with this Commission. I happened to remark that it was time some change was made, and I said, "You are aware that the work is being slummed," as we term it. He said, "I know that very well, but if a man said anything about it he would be looked upon as an informer." I saw him the next day, and he told me that he had to give evidence. He said, "I had four or five months' work, but I suppose I shall lose it through having to give evidence." When I read his evidence in one of the newspapers, I was very much surprised at the way in which he had turned round upon what he had said to me, and I thought that in the interests of justice I ought to make known what I knew concerning the matter.
2540. *His Honor.*] Did you go to Mr. Parkes and tell him? I had not seen him until to-day.
2541. *Mr. Hickson.*] Were you employed upon any of these works? Never.

P. H. Kenna.  
10 June, 1896.

William Henry Warren sworn and examined. :—

2542. *Mr. Parkes.*] You are Professor of Engineering at the Sydney University? Yes.
2543. In the week before last I think you paid a visit of inspection to what is called contract No. 79A at North Sydney? I do not know it as 79A; but I went to the intersection of two streets there and I went down a manhole and inspected the sewer.
2544. What did you see? We crawled in for a distance of about 143 feet, where bricks had been knocked out in accordance with our instructions, and we found a cavity behind the bricks about 7ft. 6in. long, 18in. in width, and 11 or 12 inches deep.

W. H. Warren.  
10 June, 1896.

2545.

W. H.  
Warren.  
10 June, 1896.

2545. Did you test any other portions of the sewer? No; we did not go beyond that. We found it extremely difficult to get even to that point.

2546. Did the man who accompanied you ask you to go any further? Yes.

2547. You think he was prepared to show you further defective work? Well, he asked us to go further, but we could not do so. We had extreme difficulty in getting to the point I have named. Mr. M'Creddie, I think, could not have gone further even had I done so, because he was more exhausted than I was.

2548. Do you think from the nature of the cavity you saw that it would be at all likely that other parts of the work would be defective—that is to say, that other cavities would have been left? It is impossible to say that. There is no doubt as to the existence of this one cavity; but one would require to see the other cavities, if they exist, before saying anything about them.

2549. But from the cavity which you saw, would you entertain a suspicion that there would be further defective work? I should think it quite possible that having found one defect you might find others.

2550. Did you test the brickwork at all? I looked at it.

2551. What class of brickwork do you think it was? First-class.

2552. Did you test the cement in the packing at all? I saw some cement mortar which appeared to be pretty good.

2553. Do you mean concrete? It was cement mortar that I saw. I do not quite know what the proportions of the composition would be.

2554. *Mr. Hickson.*] Were the holes made for you before you went into the sewer to look at them? We saw them made. We did not go into the sewer as we had originally intended to find out any defective places for ourselves on account of the extreme difficulty attending the inspection, but we sent Mr. Davis in with the men, and we could see all that they did. We saw them knock out bricks, and afterwards when we knew there was a cavity we went in to see it.

2555. Who decided upon the places at which the bricks should be taken out? The man with us seemed to know precisely where to go. He found the place at once.

2556. I understand you examined two places? Two places were examined. In the first place the work behind the bricks was solid, and there was, therefore, no use in examining it. They went on a little further and knocked out other bricks, behind which the cavity I have described was found.

2557. Was the class of workmanship, as far as you saw, generally good? Yes.

2558. Do you think that by tapping the roof of the sewer you could detect hollow places? I would not undertake to do that. I do not think you could accurately do it in a sewer, because the noise made would be too great. By tapping a wall outside you might ascertain whether there were any hollows behind it, but it would be very difficult to make such a discovery by tapping in a sewer, especially in a sewer of this size.

2559-60. Have you gone into the question of the strength of the roof of this sewer? Of course there is no doubt that at the particular place to which you have referred there was no packing. But would there be any danger of anything happening to damage the sewer? In what way?

2561. For instance, the sewer is 3 ft. 3 in. x 2 ft. 2 in., and the cavity is on the top? No, the cavity is on one side.

2562. Is it possible for the roof to be lifted from any pressure that could be brought to bear upon it in the sewer? From any internal pressure, certainly not.

2563. That would be impossible, you think? Yes.

2564. What head of water would be required to lift the roof? The best way to test it is to take a foot of sewer and to imagine that the sewer is bursting. The sewer could only burst in one of two ways. The cement itself would either fail by tension, or it would be pulled away from the bricks to which it had adhered. We will suppose that the adhesion between the bricks and the cement is overcome: I went into that matter some seven years ago. I think I made some 300 tests, which are recorded in most of the books. The result amounted to this, that a pressure of 75 lb. to the square inch would be required, and that would mean a head of 170 feet.

2565. You mean that you would require 170 feet of head in order to damage that piece of sewer? Yes. That is assuming that there is a cavity all round it, and that the mortar is 3 to 1; it would undoubtedly take that head to burst it.

2566. Do you know the depth of the shaft? I was told it was 80 feet.

2567. Therefore you would require to have a column of water 100 feet over the shaft before the sewer would burst? Yes, supposing the mortar were of good quality.

2568. If evidence has been given to the effect that 4½-inch brickwork is not sufficiently strong, that would be absolutely incorrect? Yes; 4½ inches would give abundant strength.

FRIDAY, 12 JUNE, 1896.

Robert Rowan Purdon Hickson recalled and further examined:—

R. R. P.  
Hickson.  
12 June, 1896.

2569. *Mr. Parkes.*] You identify the document I hand you as the schedule tender form for contract No. 117? It appears to be the departmental schedule form. I know nothing about the figures or quantities it contains.

2570. With reference to Ahearn's contract, No. 101, will you give me the length of the aqueduct in chains? It appears to be 29 chains.

2571. Will you have prepared a document showing the contract cost and length of contracts No. 101, No. 112, and No. 77? Some of these contracts are not yet finished. I suppose you mean the cost, as we think it will run out at the schedule rates. Of course, in some cases we have to vary the quantities.

2572. I am assuming your estimate to be absolutely correct? I understand.

2573. The sewerage plan in contract No. 112 was altered [from three pipes to an open aqueduct;—I presume that the open aqueduct will have to carry the contents of the three pipes? No; I think not.

2574. If the three sewers discharge into it, would not that be so? I think there was an off-take on each side between 101 and 112. I am speaking from memory, but I think you will find that there was an off-take. [*Vide Appendix F.*]

2575. What would be the size of the off-take? That I could not say; but I think there were two distributing sewers to the sewerage farm.

2575½. Still, there would be three 6-foot sewers joined on to the aqueduct? Yes; but of course No. 112 would not have the capacity of No. 101.

George

George McCredie recalled and further examined.—

G. McCredie.  
12 June, 1896.

2576. Will you tell His Honor what you saw and what generally happened yesterday in the course of your inspection upon Contracts 79A and 79? We started at No. 24 shaft beside the ferry. Mr. Davis and two men accompanied me. I got on to a trolley, having with me a 7-lb. hammer. I tested carefully the brickwork forming the arch or crown of the sewer all the way along. The first apparent cavity I came to was on the up-stream side of shaft No. 23. From the sound when I tapped with the hammer I was inclined to have it opened. An opening having been made, I found a small cavity 12 inches square by 3 inches deep. I continued testing as I went along, and another hole was made between shafts No. 18 and No. 19. I thought from the sound that there was a cavity behind it. When the opening was made I found only a half-inch between the back of the brick and the face of the rock.
2577. *His Honor.*] You mean an opening of half-an-inch which had not been filled in? Yes; about midway between 16 and 17 down stream. I had another opening made and found that the packing was hard up against the brickwork.
2578. *Mr. Parkes.*] Do you mean the packing or the rock? In that case there was packing. Twenty feet further on I found that the brickwork was hard up against the rock. My opinion is that the tunnel at that end goes through solid rock, and that the brickwork is pretty hard up against it all the way. I continued testing right on until we came to a point between shafts No. 12 and No. 13. When I came to a point about 125 feet up-stream from No. 12 shaft—of course the distance is only approximate; but it is as nearly as I can give it—I found a space behind the brickwork 9 feet long and 3 feet wide with an average depth of 9 inches. I tested on to the mouth of the shaft and found no other cavity. I went on through, I think, No. 79 Contract. The sewer there is I think a little deeper than in the preceding contract, and is cemented all round. I had the sewer tapped all the way along, and as far as I could judge there were no defects.
2579. *Mr. Parkes.*] Did you measure the hole you found upon the occasion of your first inspection? Yes; I measured it again yesterday to make sure of its dimensions.
2580. What were they? It was 7 ft. 6 in. by 3 feet;—I found it just the same—exactly the measurements I gave you before.
2581. You found yesterday an additional hole then? Yes.
2582. I understand you to say that Contract 79 is rendered in cement? Yes; it is cemented all round.
2583. Was 79A similarly cemented? No; it was struck-joint in the arch, and the bottom was cement.
2584. If you look at that voucher in connection with Contract 79A, you will see the quantity of cement facing paid for is 2,522 yards at 2s. 6d., giving a total of £315 5s.? Yes.
2585. What is the length of that tunnel, speaking roughly? I could not say.
2586. Would it be a mile? I should think so, but I could not say definitely.
2587. It was not cemented on the face anywhere? No; only on the bottom of the channel.
2588. Will you have measurements made upon that contract to see what the total of cement facing is? Yes.
2589. Do you feel absolutely confident that the tapping you made in the course of your inspection yesterday is a sufficient test of the soundness of the work? It is the only test you can get after the work is completed. The only other test you could get would be to strip all off, and that would be out of the question. I tapped yesterday with a hammer from the top of the arch right round the haunch. I could tell when I came to the haunches of the arch whether the work behind was solid or not. If I came to any spot where I thought the sound was at all hollow I would tap for a foot or two all round it, and if I found that solid I did not think it worth while to have an opening made. Where I was satisfied that the cavity was not of any great size I did not think it was a sufficiently serious matter to have an opening made.
2590. But you did detect hollow sounds in places besides those which you had opened? Yes.
2591. Round these places you think the work was solid? Yes.
2592. And generally you think that in the lower end of the sewer the work is correctly done? Yes.
2593. You think the brickwork is close to the rock? I think it is pretty close up to the rock.
2594. And you think you applied a fairly accurate test? Yes.
2595. *Mr. Hickson.*] As regards Contract 79, you think after an examination of it that the work there is all right? Yes.
2596. If you were a responsible officer you would be quite satisfied with that work? Yes.
2597. As to Contract 79A—the work, by the way, was not done under me—you are aware that evidence has been given here by a man named Dawson? Yes.
2598. The cavity you found yesterday was close to the cavity you found on the occasion of your last inspection? Yes; it was on the other side of the tunnel nearer to the next manhole.
2599. I suppose that if an unprincipled man deliberately made up his mind, when the Inspector's back is turned, to leave a cavity, there would be no possible way of preventing that kind of thing happening except by having an Inspector over every man at work? If a man were determined to leave the cavity, unless he were watched closely, he could leave it. Of course there is no doubt about that.
2600. The workmanship you saw all through was generally good, was it not? Yes; the brickwork was very good.
2601. You cannot call it bad work in the ordinary sense when a certain part is deliberately left out? Quite so. The larger cavities certainly looked as if they had been deliberately left out.
2602. The workmanship all through, you say, was, in your opinion, good? Yes; very fair.
2603. *Mr. Gummow.*] You said that Mr. Davis and two workmen went down with you yesterday;—did any other person go down? Yes; at shaft No. 13 Dawson went down.
2604. Did he take any part in showing you these places? I went on tapping to find out hollow places, and I told him to shout out if he wanted me to make a hole at any particular point. When we came to the cavity I have described, of course anyone could hear that there was a hollow, and Dawson asked that it might be opened out.
2605. Did he appear to know pretty well where these places were? I could not tell, because he was away behind me.
2606. But he asked you to have the openings made at these particular places? Yes.
2607. *His Honor.*] Taking the particular section between shafts 13 and 14, in addition to the very bad places you have named, did you find any other suspicious places? No other suspicious places.

- G. McCredie. 2608. In other sections you found suspicious places, but you thought there was not a sufficient indication of a cavity to warrant you in having an opening made? That is so. For instance, I might come across a small cavity, say about a foot or perhaps not as much. It is not always possible to pack thoroughly at the back of the brickwork, and a little space might be left not intentionally—because no benefit would be derived from leaving these small pockets—but because of the difficulty of packing.
2609. The small spaces to which you refer would be little hollows in the rock which, as the brickwork went on, would practically be covered up in such a way that it would not be possible to pack them? Yes. When I came to such places I tested down to the haunches, and I felt satisfied that if there were no concrete behind I should be able to tell at once.
2610. *Mr. Parkes.*] I will now take you back to Contract No. 77—the contract upon which the Monier arch was substituted for the original design of the Department;—you have taken out the quantities of the Monier arches and aqueducts? Yes. [*Vide Appendix No. 15.*]
2611. You have thoroughly checked them? Yes.
2612. Did you re-check them? Yes.
2613. And you are absolutely sure that the quantities are correct? Yes.
2614. You have no doubt about it at all? Not the slightest doubt.
2615. Upon the whole of Contract No. 77 the only parts affected by the Monier system are the arches and the aqueducts? Yes, that would be at White's Creek and Johnstone's Creek.
2616. First of all you measured up the compo? Yes.
2617. What did you make out the quantities to be? 1,084 cubic yards.
2618. *His Honor.*] You are speaking of the Monier system as it is being worked out on this particular contract? Yes.
2619. Your observations apply to both the White's Creek and Johnstone's Creek aqueducts? Yes.
2620. *Mr. Parkes.*] You did not see the Government estimates during the time you were making your own computation? No. [*Vide Appendix No. 12.*]
2621. You were afterwards shown the Departmental estimates for the two aqueducts? Yes.
2622. Will you look at item No. 21, special bluestone concrete, and tell me what the quantity is? 1,050 yards. My own quantity was 1,084.
2623. *His Honor.*] I understand that cement mortar was substituted for the special bluestone concrete? Yes.
2624. *Mr. Parkes.*] You consider that that is a fair computation of the quantities? Yes; it is as nearly as you could get at them.
2625. Take the ironwork, the next material used in the Monier system; what is your total weight of ironwork? Do you include cast-iron?
2626. I mean the total weight of iron used in construction? Sixty-two tons.
2627. What is the computation of the Department? Sixty-six tons.
2628. Those are the principal items in this particular work, and they tally very fairly with the estimated quantities of the Government as you see by this document? Yes. [*Vide Appendix No. 12.*]
2629. How would you estimate the value of the quantity of compo., 3 to 1? I make it up in this way: Take 3 yards of sand at 2s. 6d.; that would be 7s. 6d.; 1 yard of cement, at six casks to the yard, at 9s. 6d. a cask, would be £2 17s. If you add those items together you will get £3 4s. 6d. That would make 3 yards of stuff? If you divide the total by 3 you would get £1 1s. 6d. That is the cost of the material. I allow 8s. 6d. for labour, covering, timbering, mixing, and everything in connection with it. That brings the value up to £1 10s. I therefore put the compo. down as worth £1 10s. a cubic yard.
2630. There is no doubt, making the measurements in that way, as to the accuracy of your statements? No.
2631. It is universally acknowledged, for instance, that six casks of cement go to a yard? Yes.
2632. If you look at the item 51 in the Government schedule you will find that 13s. a cask is allowed for cement? Yes.
2633. That is the schedule applying to Contract No. 77? Yes. [*Vide Appendix No. 12.*]
2634. If, then, the compo. was put down at £3 10s. a yard, would not that be an extravagant price? I think so.
2635. If the price of compo. were stated at £6 a cubic yard, would not that be an absurdly high price? I should think so.
2636. The two documents before you are departmental schedule forms for contracts, are they not? Yes.
2637. You know Contract No. 77? Yes.
2638. And you know the adjoining Contract running from it, No. 117? Yes. [*Vide Appendix No. 16.*]
2639. There is no doubt that the nature of the two contracts is the same, and that they are going on at one and the same time? Yes.
2640. Can you understand why, in the case of Contract 117, excavations in solid rock with 4 lb. charges of powder are put down at £1 8s. a cubic yard, and why, in the case of Contract 77, the excavation in solid rock is put down at £2 17s. 6d. per cubic yard—100 per cent. difference;—can you understand upon what principle those values are made out? I cannot.
2641. If the excavation in the case of Contract 117 was worth £1 8s. per cubic yard, there is no doubt in your mind that the excavations in the adjoining Contract No. 77, was worth a similar sum? Well, they are upon the same line of country.
2642. Bluestone concrete, 3, 2, and 1, is bluestone concrete all the world over? Yes.
2643. Can you understand why bluestone concrete should be put down in Contract No. 77 at £2 10s. per cubic yard, and in Contract 117 at £2 a cubic yard? I do not understand it.
2644. It would be of the same value in both works? It should be.
2645. Take the excavations in hard rock where guttering and gadding only is permitted—can you understand how it is that in Contract No. 77 the item for excavation in hard rock where only guttering and gadding is permitted is put down at £3 5s. per cubic yard, while in the adjoining contract it is put down at £1 16s. per cubic yard—about 100 per cent. difference? No; I cannot understand the difference.
2646. Does it not seem to you ridiculous? It does not seem right. I do not understand the reason for it.
2647. If in the case of Contract No. 77 special bluestone concrete is put down at £3 per yard, and in Contract No. 117 at £2 10s. per yard, does not that also seem to you absurd? It does not seem right.
2648. You will see that brickwork in the case of Contract No. 77 is put down at £2 10s. a cubic yard, and in the case of No. 117 at £2 5s. a cubic yard—is not that a very extraordinary thing considering that the two contracts were going on at one and the same time? It does seem extraordinary. 2649.

2649. Can you understand the difference? Not upon the assumption that the two contracts were let at about the same time. G. McCredie.
2650. If the two contracts were let within six months of each other could you understand the difference? No. 12 June, 1896.
2651. Take item No. 23, cement facing 1 to 2;—that is put down at 2s. 3d. per square yard in the case of Contract 77, and in the case of Contract 117 at 2s. per square yard;—then take item 24, special cement facing 1 to 1;—it is put down in Contract No. 77 at 2s. 6d. per square yard, and in the case of Contract 117 at 2s. 3d. per square yard;—you will see that in almost every case the prices in the case of Contract No. 77 are greatly increased;—do you think that even if there were a period of six months between the letting of the two contracts that would justify such an extraordinary increase amounting in some cases to 100 per cent.? I do not think so.
2652. You have had considerable experience as an engineer, and you have been able to keep your estimates at about one value, have you not? We keep them at the prices going at the time. In working out every job we go according to the prices current, but there has been so little difference in prices for the last two years that our estimates are pretty well all based upon the same figures.
2653. You, as an engineer, would not care to be responsible for two documents such as those which I have placed before you, would you? You mean as to the different prices—no.
2654. Does it not look like what is called “rigging” a schedule? I do not know what reason there could be for the difference, which is very great upon many of the items.
2655. Have you not lately carried out a good deal of excavation work through rock in connection with a telephone tunnel? Yes; we have the work in hand at the present time.
2656. What are the prices you have paid for excavation in hard rock? From 9s. to 12s. per yard. The highest we have had has been 14s. I am giving you the net cost.
2657. Have you ever made much research as to the construction of sewers in England or on the continent of Europe? I have never had occasion to go into that matter very deeply.
2658. You have never noticed the cost at which this work is done upon the continent of Europe? No.
2659. Your total estimate for the aqueducts under the Monier system, deducting the piers shown in both cases, would be £4,570 for both aqueducts? Yes. [*Vide Appendix No. 15.*]
2660. You are absolutely certain of your quantities? I am.
2661. What do you base them upon? My calculations are made upon what I myself could carry the work out for.
2662. You guarantee that you yourself could do the work for that price? I could.
2663. Taking your estimate, the balance of the contract which is not connected with the Monier patent would represent the sum of about £9,200? Yes.
2664. Twenty-eight and a half per cent. taken off that amount would bring it down to about £6,300, would it not? Yes.
- 2665-6. And that amount added to £4,570 would give you a total of £10,870 for the whole of the work? Yes.
2667. Do you feel absolutely sure, from your experience as an engineer, that that is the total price which would be paid for the entire Contract No. 77, including the Monier patent? I think so.
- 2668-9. Therefore, if the Government of this country are paying £15,500 for that contract they are paying, in your opinion, an excess in value of about £4,700? Yes.
2670. You have also made out a valuation of the aqueduct shown in the original office plan? Yes.
2671. Will you give a general description of the difference between the two plans, as regards the material, for instance? In the case of the original departmental design there is a good deal of brickwork; then the piers are much closer together. There are more piers. There is no brickwork, in fact, in the other design, and it is a very big item in the original design. Then the stonework in the original design is also a good item.
2672. Is the stone not rubbed, dressed, and moulded? Yes; it is supposed to be worked stone. It is a more expensive structure altogether as compared with the Monier.
2673. Is there not a great deal of concrete? Yes; there is more concrete than in the Monier plan.
2674. You have also made an estimate of the aqueducts in the original design, and I believe it amounts to £9,679, does it not? Yes.
2675. That is also computed upon the prices ruling at the present day? Yes; and upon the same basis of price as my valuation in the case of the Monier system.
2676. Therefore, there is a difference as between the Monier plan and the original plan as regards this part of the work of £4,215? Yes; that is the difference between £9,679 and £5,464.
2677. Then, taking Carter, Gummow, & Co.’s tender for the office designs at £15,750, and taking their tender for the substituted plan at £15,500, the country loses on the bargain £4,215? Yes.
2678. There is no doubt about that? There is no doubt about the two values of the work.
2679. You went out to examine this Monier work, did you not? Yes.
2680. What did you see? I had a good look round at the work. The first aqueduct at White’s Creek was pretty well completed.
2681. Was the work as far as you could see being carried out in a special fashion or in the ordinary way? There seemed to be nothing special about the carrying out of the work. The centerings were practically the same as those used in ordinary brickwork. The concrete, too, seemed to be mixed in the usual way. It seemed to be the same as that in use upon other work.
2682. Did you notice whether all the arches you saw had centres under them? No; some had not.
2683. How many centres were being used? I could not tell you, speaking from memory. In the case of the first aqueduct I think they were all down. I remember walking underneath some arches in which they had been taken out.
2684. How many arches would you think they had been taken out of? I could not say. I made no special note of it.
2685. You have had a great deal of experience in constructing builders’ and contractors’ plant? Yes.
2686. Is not the cost of centering for an elliptical arch almost double the cost of centering for a segmental arch? I would not say that the cost is double, but the centre for an elliptical arch costs considerably more.
2687. Almost any tradesman could make the centering for a segmental arch? Yes.



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2688. But it takes a man with special knowledge to make a centering for an elliptical arch? Yes.
2689. It would have to be made from five centres? Yes.
2690. And if the arch were not quite true it would be a dangerous arch? Yes.
2691. Therefore, there is not the slightest doubt but that the centerings used for the Monier arch would not be as costly as the centerings which would have had to be used in connection with the ellipse arch set forth in the original design? The arch in the original design would be a more costly arch to make altogether. It would certainly be more costly as far as the centerings are concerned.
2692. You saw the ironwork sticking out of the arches on Contract 77 the other day? Yes.
2693. Was it rusty? Yes. It had been exposed to the weather.
2694. Was it very rusty? You could see at once that it was rusty.
2695. Did you notice whether they were building over the iron while it was rusty? No; at these particular places they were not building over it. They were working on the bluestone concrete for the bed of the channel. The iron I saw was the ends sticking out of the work.
2696. And these you say were rusty? They were bound to be rusty from exposure to the weather.
2697. Did you look at the iron which was employed in the conduit—was that also rusty? Yes; the ends there were also rusty.
2698. *His Honor.*] Do you mean just at the very end? That would be all that you could see.
2699. Do you mean that only the ends of the projecting parts were rusty, or that the whole of the projecting parts were rusty? There were only about 5 or 6 inches projecting.
- 2700–2701. *Mr. Parkes.*] It is necessary to ensure the stability of this class of work that it should all be carried out as one complete job? Ordinary work of that class we like to carry out as a complete job. We engineers in this country have not had experience of the Monier system, because none of it has been carried out here. It is a matter of opinion as to whether it will stand as well as some persons think it will in a climate like ours. It looks a very light structure. One of the points claimed for the system is that it is light and economical.
2702. Supposing the iron grill were destroyed by rust, what would become of the arch? You mean if the iron became useless?
2703. Yes? From what I can see of it, I do not think there is a margin of safety in the arch itself without the iron. It appears to be too light, but it is a matter of calculation.
2704. Would you yourself enter upon a structure of that sort? Without the iron—no, I would not.
2705. Supposing you had men specially acquainted with that class of work, would you enter upon its construction then? Not unless I had really good men at it. It is work which I should say from its lightness would require the material to be of the best description. The labour would also require to be of the very best description.
2706. If you, as an engineer, had to take in hand the work in Contract No. 77, and you suggested to your employers that the Monier principle should be substituted for the work in the original plans, would you think that your employer would have to pay for the work not affected by the Monier system at the rate of 28½ per cent. in excess of the contract value? No, I should not think so.
2707. Suppose you had tendered for this particular work, and the tender was 28½ per cent. below the valuation, and suppose that only portion of the work was affected by the substituted plan, do you not think your employer would be entitled to the benefit of having the 28½ per cent. reduction upon your prices on the portion of the work not affected by the substituted plan? Yes; if there had been an arrangement for 28½ per cent. discount.
2708. With reference to the compo. used for the construction of the arches, do you think a compo. of 3 to 1 would be as good as a special bluestone concrete of 3, 2, and 1? I do not think so. There would be more substance in the concrete.
2709. Would it be more adhesive? It would be more solid and would make a much more compact job. It would stand the thrust better than the compo.
2710. How would you compare the use of this compo. in the arches with radiating brick arches;—do you think the arches of compo. would be as good? I believe in brick arches myself.
2711. To what extent are they stronger? Well, we know what brick arches can do; but we do not know what these compo. arches can do.
2712. *His Honor.*] But as to the crushing strain to be stood by compo. and by brick—for that is really the question—that is, the crushing strain that good brick will stand and the crushing strain that good compo. will stand? I believe in brick, although it is a matter of calculation to get at the crushing strain of each.
2713. *Mr. Parkes.*] You also have made an actual test of the cost of the concrete? Yes. I have taken 7 yds. of blue metal at 12s., or £4 4s., 3 yds. of crushed sandstone at 2s. 6d., or 7s. 6d., 2 yds. of cement—that is, 12 casks of cement at 9s. 6d. a cask—£5 14s.; making a total of £10 5s. 6d. That should cover 7 yds. of concrete. Divided by seven you bring the total down to £1 9s. 4d. a yard for material. I allow 10s. 8d. for labour, bringing the total up to 40s. a yard. That is about what the Government are paying with 28½ per cent. discount upon schedule rates.
2714. What is the difference between the bluestone concrete and the compo.? There is 10s. difference when it is mixed and in its place.
2715. You mean that the bluestone concrete costs 10s. a yard more than the compo.? Yes.
2716. You have arrived at this result from an actual test of the material? Yes; I had the materials mixed.
2717. So that there cannot be any doubt as to your calculation? No.
2718. You have taken the money paid for the material and the labour for the mixing of it? Yes.
2719. And the total tallies with the Government figures with 28½ per cent. off? Yes; it comes to about the same thing. There is not much difference.
2720. Have you had any experience lately in the purchase of iron for works under your control;—you know the market values of the different classes of iron per ton? I have had a great deal of work in which I have had to use iron, and I know pretty well the value of it.
2721. Is £15 a ton for tie-bars and channel-iron an excessive or a cheap rate? At the present time I should consider £15 a ton a high rate.
2722. *His Honor.*] What would you consider a fair rate? You can buy iron at £11 a ton, and making an allowance of £2 for the iron in this case it would be worth £13 a ton.



2723. *Mr. Parkes.*] Do you consider £11 3s. a ton for cast-iron plates a fair price? It is a high price just now. £10 a ton would be a good price, but you can get it for less than that. G. McCredie.  
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2724. Do you think £10 a ton for  $\frac{3}{8}$ -in. and  $\frac{1}{2}$ -in. iron rods a fair price? Do you mean to buy them?
2725. I mean fixing them and everything complete? I think £10 is about a fair value.
2726. There is not the slightest doubt but that the three items I have quoted are not  $28\frac{1}{2}$  per cent. below market value? There is no doubt about that.
2727. The figures you have given us to-day as to quantities, &c., are gathered from the most carefully selected sources and tests? Yes.
2728. You have not the slightest doubt in your own mind as to the figures you have given us being fair prices for contractors' work? I do not feel the slightest doubt about it. I am quite satisfied as to the accuracy of the prices and quantities.
2729. *Mr. Hickson.*] I suppose that really the value of a work is what the work is tendered for? That is what we generally reckon the value at—what we can get it done for.
2730. With reference to this  $28\frac{1}{2}$  per cent.—the tender upon the original design was  $28\frac{1}{2}$  per cent. below the schedule rates, bringing the bulk sum up to £15,757? Yes.
2731. Assuming that you could get an equally substantial structure of the same capacity for £257 less would you consider that in accepting it the country was robbed? You say an equally substantial one—of course that is the question. It depends upon what the substituted plan is.
2732. But assuming for argument's sake that the plan was equally substantial and of the same capacity do you think the Government would be robbed if they could get the work done for £257 less than the amount I have quoted? Not upon the assumption that it was equally substantial.
2733. In regard to your comparison between the values of the bluestone concrete and the compo., in making that comparison you did not allow for the iron work in the compo.? No; I did not include that in the compo.
2734. You have said that you have had no experience in the construction of the Monier arch? No, I have not.
2735. First of all, as regards its strength, I think you expressed a doubt as to the stability of the structure if the iron were taken out? Yes.
2736. Supposing that a calculation had been made, and that it had been found that there was a margin of safety of six, would you not think the structure sufficiently strong? I do not think there is so much in the margin of safety as in the doubt as to whether the compo. would stand our climatic changes.
2737. A composition of 3 to 1 is not an unusual thing—you have often used it? I have often used it, but not in a case of this sort.
2738. But you have used it in rendering? Yes.
2739. Would that not be upon outdoor work where climatic change would have effect upon it? Yes.
2740. Then I think that disposes of the question of climatic change affecting the compo. And if there were a margin of safety of six, do you not think that the structure would be sufficiently strong? Leaving climatic changes out of the question, I should imagine so—yes.
2741. You have put down the composition in the Monier arches at 30s. a yard, and you have also said that no work of that nature has been done in the Colony before? I think I said I did not know of any.
2742. As a matter of fact, some has been carried out? There may have been.
- 2742 $\frac{1}{2}$ . Supposing an accurate account has been kept of the work with a view to ascertain the exact cost of it, and that that cost comes out at £4 10s. per yard, would not that affect the opinion you have formed? My opinion is that at that price it would cost far too much.
2743. Supposing every penny spent upon the work had been carefully put down, and that the result showed that it was equal to £4 10s. a yard, would not that upset your calculations, seeing, as you yourself admit, that you have not had any experience in the construction of the Monier arch? No.
2744. Why would it not do so? Because I suppose that where you took on the price at £4 10s. a yard, you would be taking the whole structure.
2745. No. I am speaking only with regard to the Monier Arch portion? Then I should say that it cost far too much money.
2746. You say that there is nothing special in the construction? Not in the composition.
2747. But in the putting of it together, I mean? I do not see anything very special.
2748. Do you think that you can shovel in the composition as you could in any ordinary work? Yes. Of course there must be a certain amount of care.
2749. And you know that care in a very small measurement means money—that is to say it is labour in a small measurement? In this case I allowed a good margin for that—10s. 8d. is allowed; and a man will make at least 5 or 6 yards per day.
2750. Do you know how the composition is put in? Yes; I saw them putting some in the other day.
2751. What is the process? The same as with any ordinary composition.
2752. *His Honor.*] Did you see the men putting up the arches the other day? No. As far as they are concerned when you get the centerings in and the boarding on it is an easy matter to put in the composition.
2753. *Mr. Hickson.*] It may not be a difficult matter, but as a matter of fact you did not see the composition going into the arches? No.
2754. You do not know the amount of labour therefore which would be expended upon that portion of the work? Not of my own knowledge. I have not seen a Monier arch constructed.
2755. You were asked some questions as to the comparative prices in the schedules to contracts No. 77 and No. 117? Yes.
2756. I suppose it would not be possible for anyone to make a proper comparison unless he knew the time of tendering and the country through which the sewer was carried? That is the reason why I asked the question I did.
2757. *Mr. Gummow.*] As to the figures in relation to those two contracts which Mr. Parkes gave to you, do you know whether they are the figures upon which the contractors are being paid or whether they are merely figures in a schedule which the Government have prepared. They are printed figures, the prices of the Department, are they not? Yes.
2758. In both cases? Yes.
2759. Do you understand how tenders are put in upon those figures? I understand that the quantities are made up by the Department and that the contractors tender so much below or above the prices given, as the case may be.

- G. McCredie. 2760. If you used that system, and if a contractor did not tender at  $28\frac{1}{2}$  per cent. below your printed schedule prices, would you ask him afterwards to do the work at  $28\frac{1}{2}$  per cent. below those prices? I do not see how I could ask him to do that.
2761. What do you think he would say if you did ask him? That would depend upon the contractor.
2762. As to these arches. The arches in the original design are not a true ellipse arch, they are only approximately elliptical, are they not? That is what they really are.
2763. Is there any great difficulty as regards those arches, in setting out five different radii;—I suppose any carpenter or ordinary man can set out ribs from five different centres instead of from one centre? It is not difficult work as regards the setting out if the man understands it; but it is more difficult in construction than the ordinary centerings.
2764. The difference as far as I can see is that the work would have to be set out from five centres instead of from one; it would take a little longer, that is all? Yes; and it would take a little more labour and timber in construction.
2765. I think you said that the country would lose £4,215 by the substitution of the one plan for the other; would it pay £4,215 more? That is a matter for the Department.
2766. Supposing a better result had been arrived at in the performance of the contract? That, of course, would be a matter for proof.
2767. Take a general transaction with one of your clients. If you found that by making an alteration you could give your client a certain benefit, and if you pointed out to him that the work would not cost any more and would be much better as a job, do you think he would be likely to say to you, "Am I getting the same quantity of brickwork or timber as in the original design?" Which do you think would trouble him most—the fact that the altered job would be as good and would cost less, or the alteration in the quantities? The greatest trouble with a client generally is that he does not want to pay any extras.
2768. In your calculations have you allowed anything for a royalty on the Monier system? No.
2769. *Mr. Parkes.*] The question I really put to you was this—did not Messrs. Carter, Gummow, & Co., by getting paid upon the office schedule on the quantities contained in the Monier system get an advantage of £4,700? According to these quantities, which are correct, they do get an advantage to that extent.
2770. *Mr. Hickson.*] Do you know that these rates are only set down for progress payments, and that this is a lump sum contract. Are you not aware that it does not matter what these rates are so long as finally the sum of £15,500 is not exceeded. Do you not know that these rates are merely fixed for the convenience of progress payments. Supposing a tender amounted to £15,750, at  $28\frac{1}{2}$  per cent. below your schedule prices, and that a tender came in at a lump sum for £257 less. Assuming the work to be equally good and of the same capacity, would not your client get a distinct benefit to the extent of £257? You are assuming that the structure is equally good.
2771. *Mr. Parkes.*] In this case is the structure equally good? In my opinion it is not.
2772. *Mr. Hickson.*] Have you calculated the strains? No.
2773. Then how can you, an engineer, say that the structure is not equally good. Supposing we had had these calculations made and that we had found that we had a factor of safety of 6, should we not in that case have a structure equally good? Have you worked out the factor of safety in the case of the original design?
2774. That is beside the question. Supposing we had worked out a factor of safety, 6, in the case of the Monier arch, would you not consider that a stable structure. Would you as an engineer have any hesitation in being responsible for it? Assuming that I was satisfied that there was the factor of safety you name, I should not see any risk in the structure.
2775. *His Honor.*] That is without calculating the effect of the iron? Without calculating the effect of the iron. Of course, Mr. Hickson has apparently gone into a calculation of the strength of the Monier arch, whereas I have not yet done so.
2776. *Mr. Gummow.*] In addition to the royalty, do you not think the contractors are entitled to receive some profit on account of the risk they are taking and the guarantee for a number of years? If they take a risk in connection with the work, and if they enter into a certain bond, something, of course, must be allowed for that.
2777. *Mr. Hickson.*] Do you know the risk the contractors are taking? I do not know what the bond is.
2778. *Mr. Parkes.*] You had run out the quantities of these two designs;—you see the difference in them. Now I will ask you this question. If you had bargained for a stone building would you accept a wooden building in its place? Certainly not.
2779. Would you feel inclined to take the cheap wooden house or the stone structure, even though the one might for certain purposes be as good as the other? No.
2780. *His Honor.*] You say that it is fair to allow something where there has to be what may be called an insurance, in consequence of the plan being to a certain extent an experiment? Yes.
2781. On that account you would add something to the cost which you have worked out as the probable actual cost of the work? Yes.
2782. But how much that would be it is difficult for you to say? That is a question for the contractors. I presume they would get their 15 per cent. royalty.
2783. That would be taken by them into the amount of the tender, I presume? I should think so.

William Thompson sworn and examined :—

- W. Thompson. 2784. *M. Parkes.*] What is your profession? I am a quantity surveyor to the Builders' and Contractors Association.
- 12 June, 1896. 2785. How many years' experience have you had as a quantity surveyor? Since August, 1885, I have been engaged in measuring up works daily.
2786. Were you at any time a quantity surveyor in the employment of the Government? I have worked out schedules of quantities of buildings for the Government Architect.
2787. Have you made a careful valuation of the Monier arch portion of Contract No. 77? Yes; as far as the Johnstone's Creek aqueduct is concerned. Your instructions to me were to take out the quantities for the Johnstone's Creek aqueduct upon the two systems. I did not go into the quantities of the White's Creek aqueduct. [*Vide Appendix No. 17.*]
2788. You have a rough copy of your estimate? Yes. 2789.

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2789. Deducting the piers, you estimated the Monier aqueduct at Johnstone's Creek to cost what? I took the piers from the ground level. I did not go below ground. Speaking roughly, I make the amount £2,342. [*Vide Appendix No. 17.*]
2790. Upon this one aqueduct you estimated the compo. at how much? 571 yards.
2791. In the two aqueducts the quantities would be about the same, would they not? I should think so. One would be a little longer than the other, but there would be about the same cubic contents.
2792. So that, doubling the figures you have given, you would have a total of about 1,140 cubic yards? I should think that would be about it.
2793. Take item No. 21, in the office quantities, what would it amount to? About 1,140 yards.
2794. That would be a fair allowance? Yes.
2795. There can be no doubt that the quantity in the departmental schedule is fairly correct? Taking those figures for the compo. I should think it was. It would be a little more than that if anything.
2796. Take the iron-work;—what is the total of your iron-work? The total of the three quantities of the three classes of iron-work would be about 33 tons 8 cwt.
2797. Doubling that for the two aqueducts, you would have what? 66 tons 16 cwt.
2798. The office quantities are what? 66 tons, roughly.
2799. There is no doubt, then, that the office quantities are correct, as far as you can see? As far as I can judge.
2800. You have been used to taking out the values of quantities as well as the quantities themselves, have you not? Yes.
2801. What would you estimate for a good class of compo. work—3 of sand to 1 of cement? One yard of cement and three of sand ought to make 3 yards of compo. when mixed.
2802. That is the way in which you usually compute that work? That is the usual way in the case of architects? You would have 3 yards of sand at 2s. 6d., and 1 yard of cement at £3, making a total of £3 7s. 6d. That would give you sufficient material to do 3 cubic yards, or £1 2s. 6d. a yard. Of course, there is the labour to be considered. As far as the mere mixing of the stuff is concerned, 1s. 6d. a yard would be ample for that.
2803. Suppose there were any special labour? I cannot speak as to that, but the mere mixing ought to be done for 1s. 6d. per yard.
2804. Taking the total, what is a fair sum? I have put down 30s. a yard. I have allowed 4s. or 5s. a yard for centres.
2805. You have often had to take out quantities for compo.? Yes, in building operations.
2806. And this calculation is based upon your experience? Yes.
2807. The rates you have given are the ruling rates at the present day? Yes.
2808. Taking cast-iron plates, or the most elaborate work in cast-iron, what would be a fair price for it? £11 or £12 a ton.
2809. Is that a fair price? A very good price.
2810. Taking the tie rods and channel-iron—what would be a fair price for them? I have put down two classes of wrought-iron; the channel and tie rods I have put down at £14 a ton, and the wrought-iron in the bars three-eighths inch and a quarter-inch, secured by copper wire, I have put down at £11.
2811. Those are the ruling prices to-day? Yes.
2812. And that makes your total for the one aqueduct £2,342? Yes, without the piers.
2813. Doubling that amount, you make the value in the two aqueducts £4,684? Yes; assuming that the other aqueduct is equal to this one.
2814. Do you not consider £5,000 a very fair price for the Monier patent as it is designed? I should think £2,500 would be a fair price for the design I took out, exclusive of the piers.
2815. Did you check your figures? Yes.
2816. Did you have them rechecked? Yes.
2817. Did you get anyone to assist you? No; I did it all myself. Still I checked them very carefully.
2818. Taking your proportions for the two aqueducts, £5,000 would be a fair sum? Yes, exclusive of the piers.
2819. Have you made out an estimate for the balance of the work—the work not affected by the Monier patent? Yes; but it is not yet completed.
2820. When could you give us that information? I could not have it ready before Monday at the earliest.
2821. For the purposes of calculation, the work under the departmental scheme might be represented at about £9,200;—taking off the builders 28½ per cent. undertaking, under his tender, that would make the amount what? £7,150.
2822. That, added to the sum of £5,000, would give a total of what? £12,150.
2823. Do you not think £12,150 a very fair sum to pay for the whole of the work, including the Monier aqueducts? I cannot say. I have not gone into anything beyond the Monier aqueducts.
2824. You made an estimate upon the original office design? Yes.
2825. So far as the one aqueduct was concerned? Yes.
2826. What was your estimate in respect of the Johnstone's Creek aqueduct? In that case you told me to measure from the footing, and I did so. I made the amount £4,746 5s.
2827. The proportion which the Johnstone's Creek aqueduct as constructed under the original scheme would bear to the aqueduct constructed upon the Monier plan would be about 2 to 1—nearly double the amount? It is 1 to 1.63, including the piers.
2828. You are sure your figures affecting the departmental design are correct? Yes.
2829. You have carefully checked them? Yes.
2830. There can be no doubt that the original design, as compared with the Monier system, would be in the proportion of 1.63 to 1? That is the conclusion I have arrived at.
2831. You can thoroughly guarantee the quantities you have given? To the best of my ability I can.
2832. You feel certain from your experience that these quantities are correct? Very nearly, if not absolutely.
2833. *Mr. Hickson.*] You have taken out the length of the Johnstone's Creek aqueduct? Yes.
2834. What length did you take out? I took it at 980 feet. I think it runs a shade longer going into the channel.
2835. You have put down 30s. for the compo.? Yes.
2836. I suppose you have had no experience as to how this compo. is put into the structure itself? No; but I have an idea how it is done.

- W. Thompson. 2837. Do you think 30s. per yard would be enough to cover the cost, considering the expensive way in which the compo. has to be put into the structure? I think it would very nearly cover it.
- 12 June, 1896. 2838. Suppose a similar structure had been put up, and that the actual cost, after very careful figures had been taken out by the Department, came to 90s. per yard, would that alter your opinion at all? I should wonder how the money could be spent.
2839. Supposing you could see the figures for yourself? There is no getting beyond the facts, of course.
2840. If you could see these figures showing the actual cost of the work to be what I say, that would naturally upset your estimate of 30s. a yard? Mine is a mere estimate. You say you have had the work actually done. That is another matter.
2841. Our £4 10s., of course, includes the iron, you understand that? Yes.
2842. Did you put down anything for rendering? Yes; I put down 5,540 yards superficial at 1s. 6d. per yard. I am on sure ground there. It is an item I am thoroughly used to. I think I have allowed a very fair price.
2843. What proportions did you allow for the rendering? One to 2.
2844. Supposing the proportions were 1 to 1, that would alter your price? My price would very nearly cover it. Of course, if it were all 1 to 1 it would be worth a little more; but that is not the case, I understand.
2845. *Mr. Gummow.*] Did you allow anything for supervision and profit in your estimates? No; I merely allowed for the working prices.
2846. Did you allow anything for royalty, guarantee, or insurance? Those are things I knew nothing about. I made no allowance for them.
2847. *Mr. Parkes.*] Take the schedule of the Department, and look at item 21. You will see that special bluestone concrete has been altered to special cement mortar, at 3 to 1, and that it is put down at £3 10s. per cubic yard? Yes.
2848. If you look below you will see items for ironwork charged at special rates in the schedule? Yes.
2849. They are not included in the compo. prices? No.
2850. They are independent items? Yes.
2851. You have given the prices separately, therefore, in your own estimate, have you not? Yes; I have kept the prices of the iron separately.

Thomas Griffiths sworn and examined:—

- T. Griffiths. 2852. *Mr. Parkes.*] What is your position? I am Assistant Engineer to the Water and Sewerage Board.
- 12 June, 1896. 2853. Are you a computer of values and quantities? Yes.
2854. On 9th September, 1895, you wrote to the Engineer-in-Chief for Metropolitan Sewerage Construction, Mr. Darley, as follows:—"Will the Engineer-in-Chief kindly approve the accompanying schedule of prices for use in preparing progress vouchers in this contract, the price for which is 'lump sum.' It will be observed that quantities are slightly altered from original. This has been done in order to provide for Monier work which has been substituted for brickwork?" Yes.
2855. You substituted a sheet of figures with that letter, and the document I now hand you in is a copy of it? I think so.
2856. Are these figures and quantities taken out from the plan? Yes; practically.
2857. They are correct, are they not? Yes; to the best of my knowledge.
2858. Why did you adhere to the original office figures as prices for the quantities? What original office figures do you mean?
2859. I mean the printed office figures? I do not think the tender as accepted has anything to do with the original schedule. It is a different contract.
2860. Do you not observe that the quantities are greatly reduced? I do not see that that has anything to do with it.
2861. Look at items No. 1 to No. 20; they have nothing whatever to do with the Monier arch, have they? No; nothing at all.
2862. Then why should you have paid for these items at the rate of 28½ per cent. above the contractor's undertaking? I have not paid for them at 28½ per cent. above the contractor's undertaking.
2863. Are they not paid for upon these printed figures? They are paid for according to these figures, but there is no percentage at all in the case of contract No. 77. It is a lump sum contract.
2864. The original contract price upon these printed figures came to £22,000, did it not? That does not apply to this contract. I used this schedule because it was the most convenient thing to do. I did not write out another one.
2865. When you made out the quantities for the Monier work apart from the other work altogether you put in a fair value for it I suppose? I ought to explain that the Monier arch being a part of this contract I worked out the schedule as well as I could up to the total sum. You will see that some of these quantities are altered. The red figures will show you the quantities to which I refer. Those alterations were made simply for the purpose of making the schedule agree with the lump sum.
2866. Are the quantities not correct, then? The quantities have been altered to make the total come as nearly as possible to £15,500. These figures do not affect the matter one way or the other. They are inserted here simply for the purpose of making progress payments.
2867. Do I understand, then, that 1,050 cubic yards is not the correct quantity for the compo? Yes, that is correct.
2868. And 150 yards for the brickwork, and 12,000 for cement facing? They are all practically correct.
2869. And the prices you are paying upon these items are also correct? They are only tentative; these are only progress measurements.
2870. Is £3 10s. a cubic yard for compo, not a fair value? These are merely tentative prices; they could be altered in the next voucher if we liked.
2871. But is £3 10s. a cubic yard a fair value? To the best of my belief it is.
2872. Is £11 3s. per ton a fair value for cast-iron plates? I think so.
2873. Therefore, the estimate for the Monier part of the work is not reduced in the money column whereas it is reduced in the quantity column? I do not see that that has anything to do with the matter.
- These

- These quantities and prices are merely tentative. They are subject to alteration from time to time, and as I have already explained they had nothing at all to do with the contract. T. Griffiths.
2872. As a fair thing between the taxpayers and the contractor, if the quantities are diminished ought not the prices to be diminished also? Not in the case of a lump sum contract. We cannot estimate the exact quantity of work done from time to time. 12 June, 1896.
2873. Supposing the lump sum reveals the fact that the contractors are getting a clear 30 per cent. advantage? I cannot look at the matter in that way. The 28½ per cent. you refer to has nothing at all to do with this contract. It was a separate tender.
2874. What was the object of the Department in calling for tenders at all upon their original elaborate design if they intended to give Messrs. Carter, Gummow, and Co. the contract upon the Monier plan without any competition? You are now asking me a question I cannot possibly answer.
2875. I am basing the question upon your statement that the Monier arch tender is a lump sum tender to be paid for upon these prices? I said that the whole contract must be taken as a lump sum contract. You must include the Monier arch with the other portions of the work.
2876. But they are being paid for at the office estimate of cost? As I have told you this schedule is only made out as a progress measurement. Supposing, for instance, that the work could not be completed at these prices the sum of £15,500 would, nevertheless, be all that would be paid for it.
2877. Supposing an extra takes place—take the contract agreement as drawn up—supposing an extra takes place upon the tunnel excavation, could not the contractors upon their agreement obtain it? I do not think so.
2878. Have you looked at the specifications? Yes; but this is a lump sum contract.
2879. That makes no difference; the quantities of the lump sum come out so as to make the exact sum of £15,500? Yes.
2880. That £15,500 is made up by the payment on certain reduced quantities which you admit are right;—the payment is being made upon the original office values? Yes.
2881. It is not likely that the contract can exceed the amount, because you have carefully made up your estimated cost;—you have made up your quantities and have attached your prices, and they make the exact sum of £15,500? Exactly.
2882. Then how can the question of whether the amount is exceeded or not come in? I do not quite understand you.
2883. You say that the quantities are right? Practically; but they are only approximate. The contract must not exceed the £15,500. The prices which are attached to make up that amount for the purpose of progress payments could be altered in the next voucher if it were necessary.
2884. The prices for payment? Yes.
2885. Have you not, as a matter of fact, paid £9,000 at these prices? Because they have worked in.
2886. When, then, do you propose to alter them? If at any time we are found to be out one way or the other they can be altered. They are not fixed prices at all.
2887. You are paying for a certain quantity of excavation at 57s. 6d.? Yes. I do not at this moment remember the exact price.
2888. That is the original office value? I think it is.
2889. That is not 28½ per cent. off? No.
2890. Are you not paying upon other items at original office rates? You will see that I have reduced these quantities in some cases. For instance, the brickwork has been reduced by a considerable amount.
2891. But you have not reduced the price? You cannot expect a person to build a ring of brickwork in a tunnel at the same price as that at which he would build 14 inch or 18 inch work outside.
2892. Is not the cost of the finished work in your original plan much higher than the cost of the tunnel work? No.
2893. Is it pointed in this case as it is supposed to be pointed in the case of the original plan? No.
2894. Is there not a considerable item put down for stone;—is there not a great reduction in the quantity there? I do not consider the schedule of the original design in the matter at all. A schedule has to be prepared for progress payments upon the £15,500 contract, and it is not binding on the Department or the contractors.
2895. When you wrote your letter under date of 9th September, 1895, you sent in the quantities for this work? Yes.
2896. On what date were the quantities taken out in respect of Contract No. 117? I could not say. Those quantities were prepared by the chief draftsmen in the office.
2897. You took out the quantities for the Monier arches? Yes.
2898. Upon what did you base those quantities? They were only fixed to arrive at the sum of £15,500.
2899. I take it that the excavation through sandstone is about the same in most cases? It varies constantly.
2900. There is an average taken for sandstone excavation? Not necessarily.
2901. What is the difference between the tunnel work of Contract 117 and Contract 77 in the hard rock excavation? I cannot say offhand.
2902. Does not the tunnel in each case go through hard rock? But there are other things to consider besides the hard rock.
2903. I am taking the excavation by 4-in. charges of powder in hard rock;—what justification would there be for paying the contractor, upon Contract 77, 100 per cent. more than you are paying the contractor upon Contract 117? I do not think the prices in respect of Contract 77 should be considered part of the contract. They are tentative prices for the purpose of arriving at some estimate within a reasonable distance of the lump sum.
2904. *His Honor.*] But take the original estimate;—when the Department originally called for tenders the quantities shown upon the document before you were taken out, and the amounts placed opposite to the various quantities were supposed to be fair prices for those quantities? Yes.
- 2905–6. The question is, whether the two different schedules issued within a short time of one another do not show very different estimates? Yes. At the time this Contract 117 was tendered for—and I think it was something below the schedule—a contract at North Shore was accepted 24 per cent. above the schedule, so that there was a difference of 30 per cent. within a few weeks.
2907. That is a difference as between North Shore and Annandale? Yes.

- T. Griffiths. 2908. *Mr. Parkes.*] In preparing your schedules you have some method which brings you to the contract value? We try to do so, but sometimes we cannot get near the contractors.
- 12 June, 1896. 2909. Take your estimate for concrete; concrete is not a thing which varies with the nature of the ground; it is concrete at any time and in any situation;—why do you put concrete in the schedule of No. 77—your own making up—at £2 10s. when concrete is put in for the next job at £2? I do not see how you can compare the two things. In the one case there is a lump-sum tender and in the other case there is a percentage off schedule rates. In the case of this particular work I distributed the price over the quantities as well as I was able. I looked at the original schedule, and I saw that brickwork was cut down considerably and that sandstone and bluestone were also reduced, and I thought the price I put in was a fair price for the payment of progress vouchers. The whole job is in a lump sum, and these prices of mine do not necessarily represent the value of the work.
2910. *His Honor.*] Is there any difference, with the exception of the compo., between the prices tendered for in the case of No. 77 and the prices in this estimate made under the lump-sum contract? There is some additional work.
2911. *Mr. Parkes.*] But the only alteration is in the compo.? Yes; I think I put the compo. at 10s. a yard more than the special bluestone concrete.
2912. When you found that the work upon contract 77 was so much less than the work on the original design, do you not think you were justified in asking for a payment at 28½ per cent. below the price put in by the contractor? I had no power to do it. A tender had been accepted at £15,500, and it had nothing to do with the old schedule in any shape or form. I merely wanted to give the contractors a progress voucher, and I prepared a schedule accordingly. It can be altered at any time. It is not binding upon the Department or the contractors. As a matter of fact, when the work is finished the contractors will have received £15,500. The quantities are not binding in any lump-sum contracts.
2913. When you made up this estimate did you refer back to Mr. Hickson? I did not make this estimate, as you call it. I so arranged the schedule that the aggregate amount would come to £15,500.
2914. Did you have any communication at all with Mr. Hickson about the matter? No.
2915. Did you come back to the office at all when you were making these prices come out at the lump sum? I did not see Mr. Hickson; I saw Mr. Darley. He was my chief.
2916. You did not see Mr. Hickson in connection with the fixing of this schedule? No, we were in two distinct Departments. I fixed the schedule, and asked Mr. Darley to approve of it. He did so, and I sent a copy of it to the resident engineer so that he might prepare a progress voucher.
2917. When you gave the schedule to Mr. Darley did you tell him that you were paying at the office rates? I did not; he would see that certain items were not required, and he would see the other prices.
2918. Did you have any conversation with Mr. Darley as to whether you would pay office rates or on a 28½ per cent. reduction? It was not necessary. The prices here are not fixed. They are not binding. They have nothing to do with the final voucher in any shape or form.
2919. When the whole contract is paid for, will it not, as a matter of fact, have been paid for at these office rates? No.
2920. At what rates? At rates within the lump sum.
2921. *His Honor.*] I take it that what Mr. Parkes wishes to ascertain from you is how you think these prices will work out as between the contractors and the lump sum—that is to say, will the thing work out at office rates, or something below office rates? I could not say. The sum of £15,500 is not to be exceeded. The contractors have already done extra work for which they will not be paid.
- 2921½. *Mr. Parkes.*] Where is any excess likely to come in? In the foundations, for instance. We could not estimate the exact cost of the piling, and they have exceeded the quantity.
2922. A clause in your specifications throws the responsibility upon them under any circumstances? Exactly. They have exceeded the quantity.
2923. And they have to take the builder's risk? Yes.
2924. As a matter of fact, you have paid for the excavations;—the tunnel is completed? It was not completed when I was there last. To the best of my belief, it will not be finished for some time yet.
2925. You have put it in your voucher as completed? No.
2926. What is the amount there? 1,024 yards at 57s. 6d., or £2,944.
2927. Take the item of excavation in hard rock, 1,160 yards at 6s.—that is completed and paid for? You cannot say that the thing is completed because these quantities are only tentative.
2928. As a matter of fact, was not this schedule made out to arrive at your estimate of the work? No. It was made out for progress payments, which is a very different thing.
2929. Was it not made out with a view to the quantities of the work? No. It was prepared for the purpose of paying progress measurements. It is arbitrary, and can be altered to-morrow.
2930. But for the purpose of paying contractors, would you not make it accurate? It is accurate as far as it goes. If to-morrow the work is finished, and according to measurement, the contractors are entitled to £3,000, and that amount comes within the total sum they would receive, because it is a lump sum contract.
2931. *His Honor.*] And if you find out that your prices run out to the full amount, less the retention money, you will stop payment altogether? Yes. We do not pay them more than £15,500 under any circumstances. Mr. Parkes says that we are charging the same rates as the contractor tendered at with 28½ per cent. off; but the quantities supplied to the contractor are not the quantities supplied in my schedule, which alters the matter altogether. The quantities supplied to the contractors in the first instance are not the quantities on which I base my schedule.
2932. *Mr. Parkes.*] Are not some of them? Yes.
2933. Are the majority of them? Well, some of the bigger items are altered.
2934. Are the excavations altered? I think they are practically the same. You are not representing matters as they ought to be represented. You ought to point out that while 28½ per cent. was taken off the original quantities because they were certain quantities, those quantities have since been reduced. You cannot, in fact, make a comparison between the two cases.
2935. You are not forgetting that the value of the aqueduct, as proposed by the Department, was not £22,000, and that its real value was £15,750? Exactly; but I have nothing to do with that.
2936. That would not be the value at the prices you have here? You are now asking me about a thing with which I have nothing whatever to do.



T. Griffiths.  
12 June, 1896.

2937. After tenders have been called for, and the contractors have tendered at 28½ per cent. off the office values, those office values disappear? I know nothing at all about that. I am supposed to carry out Contract No. 77 on the Monier principle. I have nothing whatever to do with 28½ per cent. I am not supposed to be aware, as a matter of fact, that the 28½ per cent. was taken off the £22,000.

2938. *His Honor.*] Did you make out the prices for the original tender upon Contract 77? No.

2939. You did not, I understand, make out the prices upon Contract 117? Not finally; but they were submitted to me before they were approved. [*Vide Appendix 16.*]

2940. *Mr. Parkes.*] Did you approve of them? Yes.

2941. *His Honor.*] How did you arrive at them? I considered that prices were being continually cut down. Take the North Shore contract, for instance. We could not get within 25 per cent. of the contractors in those days. I could not cut down many items, but I cut down excavations really with the object of seeing if I could not get within reach of the contractors.

2942. You had found that the tenders had been a long way below? Yes; reaching 30 per cent. below office prices.

2943. That was shown when the tenders for Contract 77 were called for? That is not the only case.

2944. And that opened your eyes to the fact that the office had been fixing rates which were too high? Yes. I considered also that material was cheaper; that the contractors were getting the necessary experience, and that they had their working plant in hand. All these things had a tendency to cheapen the cost of the work.

2945. *Mr. Hickson.*] I suppose it is really impossible to make a comparison between any two sets of tenders with regard to the price? You cannot do it.

2946. As a matter of fact, did you not, within a few weeks, get a tender some 28½ per cent. below the office prices and another tender as high as 24 per cent. above them? I have just pointed that out in connection with Contract 117 at Balmain. I made the prices low for the reason I mentioned, and the contractors accepted at 9 per cent. below the office schedule. Speaking from memory, a week or two afterwards, going over the North Shore work, I considered that owing to the great difficulties attending the work, from the depth of shaft and one or two other things, I could not get the work done at the same price. When I came back to the office I altered the prices and made them higher, with the result that, although I increased the schedule considerably, there was, in one case, I think, a tender 24 per cent. above, so that there was an actual difference in a week or so of pretty well 50 per cent.

2947. Between the 9 per cent. below and the 24 per cent. above? Yes.

2948. In connection with this Contract 77, is it really material what prices you put down opposite each item, so long as you do not finally exceed the £15,500? No.

2949. You might have paid for the contract upon a principle which is known to have been adopted before, estimating one-tenth of the work and paying for that one-tenth? Yes.

2950. You might have paid for the work without any quantities at all? Yes.

2951. In a lump sum contract it is usual, however, to put in schedule prices? As a guide for progress measurements.

2952. In this case had not the contractors to do all the work, no matter what it cost them, for £15,500? Yes.

2953. Have they not already had a considerable increase upon the foundations of one of the piers? Speaking from memory, I think the area of the abutment on the Forest Lodge side was considerably increased. There was a large area of extra excavation and a large quantity of extra concrete.

2954. Do you propose to pay the contractors for that? No. They have never asked for payment, and they have never suggested that they should receive any payment for it. They have done nothing beyond pointing out the increased size of the abutment.

2955. You have had good experience in sewerage work, and you have an idea of the value of that work? Yes.

2956. Have you made an estimate of the value of the compo. with the iron bars in it, known as the Monier arch? I have. I think the schedule works out nearly at £4 10s. a yard, including the ironwork.

2957. Do you think that that is about a fair value for it? I think it is a very fair value. An arch with a 75-foot span would have a specially designed centre sufficiently strong to support the building during construction, and would of course have to be put up very accurately, involving a large quantity of timber and iron work. It has to be made in such a way that it can be put up and taken down again.

2958. Will you describe the process of putting up the arch itself? After getting the material on the ground there is, of course, the gauging. The sand has to be passed through a sieve, and then it is put in the usual way into the gauge-box. The compo. is gauged at 3 to 1, and then a certain percentage of water is put in. It is turned over, I think, four times. I have watched the process, and I know that it means handling the stuff six or seven times in all. After it has been properly turned over, the compo. has to be taken on to the work, and, as you will see from the drawings, it has to be lifted up in some cases 30 feet. Then, unlike any other work I have ever seen, it has to be put in in small quantities. It is more like weighing out sugar than carrying out a big public work. It is put in with wooden rammers, care being taken that the ironwork of the grill is not displaced. There are little pieces of wood attached to the back of the lagging, which keep the grill in its proper place a certain distance from the face of the work. There are two or three men there; and occasionally a little water has to be added, according to the consistency of the stuff. I do not know of any other public work where that class of work is done, and where so much care is required. Then the arch has to be kept damp during the whole time. Sand, as a rule, is put right over the arch, and it is kept moist for the purpose of letting the necessary chemical action take place before it gets too dry. The iron is left in within an inch of the soffit of the arch, and when it is not long enough a lap is allowed of about 8 inches, and it is tied up with wire. I consider that the mixing of the compo. bears a very small proportion to the actual labour involved in making the Monier arch. You have these huge centres to lift for a comparatively speaking small bit of work. The arches are narrow, and there being such small quantities there is nothing to cover the expense, as in ordinary concrete and brickwork. The labour is very tedious, and the levels and the various contours have to be carefully preserved. I ought to have explained that all the ironwork passes through a machine, and has to be carefully curved to a certain radius. As far as I have been able to judge, it is a very expensive process as far as actual labour is concerned. I therefore put down 10s. a yard more for the

compo.



- T. Griffiths.  
12 June, 1896.
- compo. than I put down for special bluestone concrete in the same position. Then there is the extra size of the centres to be considered. You cannot handle a 75-foot centre as you would handle a 25-foot centre.
2958. The mesh of the ironwork is 4 inches. Yes.
2959. And it is within an inch or an inch and a half of the face of the rendering? Yes.
2960. A great deal of care has to be taken in putting the compo. underneath—it cannot be shovelled in? No.
2961. Of course, the centring is put in first, and then the grid? Yes; and at certain distances pieces of wood of the necessary thickness are nailed on to the lagging.
2962. If any person has described this as ordinary compo.-work he would be quite wrong? Yes.
2963. The work is what is commonly known as all labour and no measurement? Yes; we should consider it all labour and no cubic measurement after all the work is gone into.
2964. And you think the prices you put down for progress payments are not too much? No.
2965. You would not be surprised to hear that a concrete arch which the Department put up some time ago upon the Parramatta Road came to £4 10s. a yard? I daresay it would. I do not know what the span of the arch would be.
2966. *Mr. Gummow.*] As to the payments to the contractors, you said that the method is sometimes adopted of paying them, what is considered a fair amount, as they go on with their job? Yes; that is sometimes done.
2967. Do you consider that as good a method as having a schedule fixed up? Certainly not.
2969. Do you think that the method of having a schedule made up prevents disputes with contractors? Certainly; it is a far better method. You cannot measure public works in the same way that you would measure an ordinary building. You cannot make one payment on one joist, and another payment on the second joist, and so on.
2970. Do you not know that in this particular case the contractors have done a lot of work which they will not be paid for, and which they have not asked to be paid for? Yes. I have already explained that the size of one abutment would be considerably increased. If the contractors had been paid for the increase it would have come to a considerable sum. Then the piling was increased in the piers.
2971. Have you been in touch with this contract for the last two months? No. Speaking with reference to extras, there was some galvanised iron substituted for ordinary iron.
2972. *Mr. Hickson.*] In the piers? Yes. I know that some iron was placed in the concrete without any extra payment.
2973. *Mr. Parkes.*] Had you anything to do with the construction of the Parramatta Road test of the Monier arch? No.
2974. *His Honor.*] Do I understand that the grid for a large arch is made in one piece? On account of the length of the arch it is necessary to scarf it. That is done by tying it with wire.
2975. Then it is made into one large piece? Yes; the whole arch is one grid, you may say, extending from end to end.
2976. It rests on the centerings with the ends projecting over the piers? Yes.
2977. *Mr. Hickson.*] Did you not ask the contractors to make a test arch? Yes; we got them to make three altogether.
2978. Were they not very elaborately tested? Yes; the tests were made in Mr. Darley's presence and my own.
2979. Did you pay the contractors for that? No; not one penny.
2980. That had to come out of the £15,500? Yes.
2981. *His Honor.*] What were the dimensions of these test arches? There were two 24 ft. 6 in. by about 22 inches rise, 3 inches thick at the crown, and with 5-inch haunches.
2982. What would be the breadth? About 3 feet. These arches were tested to see what was the elasticity. Seventy tons were put on the two arches—35 tons on each. In the first series of experiments we got the arches covered with sand, and we got all the men on the work—I think about sixty—to mark time as soldiers would do on it. We then observed the deflection to see whether it was a permanent one. It was found that there was no permanent deflection. A 70-ton load was left on all night. When the biggest load was on there was a little deflection, but on the following morning, when the load was removed, the arch resumed its normal position.
2983. What would have been the result had those arches been without the iron grill? I have not gone into that calculation.
2984. Do you think they could have stood that weight? Nothing like it without the iron. There was no permanent deflection.
2985. *Mr. Hickson.*] How long had the arches been built when the test was applied? Nine weeks.
2986. Are you as an engineer satisfied with the stability of the Monier arches in Contract 77? Perfectly.
2987. You would not describe them as Cheap Jack structures? No; certainly not.

MONDAY, 15 JUNE, 1895.

George Stanley Brown sworn and examined:—

- G. S. Brown.  
15 June, 1896.
2988. *Mr. Parkes.*] What is your position? I am Librarian at the Patents Office.
2989. You have charge of all the documents there? Yes.
2990. You have a knowledge of the whole of the information upon which patents are granted? Yes.
2991. You now produce the papers upon which what is known as the Monier arch patent was granted? The patent which we identify as the Monier patent was taken out by Messrs. Carter, Snodgrass, and Baltzer. I produce now the patent grant and the whole of the papers connected with it. [*Vide Appendix 18.*]
2992. Is there among these patents any authority from the original Monier patentee for the use of this patent? No, none whatever. The patentees have applied as introducers of the invention by virtue of a communication from abroad.
2993. What was the communication? The invention itself would be the communication.
2994. They had no distinct authority from M. Monier himself for the introduction of this patent? Not so far as the papers show; but it would not be necessary for them to have any authority to apply for letters patent for a foreign invention in this Colony.

2995.

2995. Have you made any comparison between the patent granted under the letters patent you produce and the original Monier patent? No. G. S. Brown.
2996. Do you think the patent which you have referred is the full patent? No; I think not, from what I have seen of the English patent. 15 June, 1896.
2997. It is only a part of the patent? That is all, I think.
2998. Supposing the original Monier patent included any particular silicate in the compo. or anything of an unknown nature which really formed the patent, it is not unlikely that Messrs. Carter, Gummow, & Co. would know of it? They would know by receiving a communication from original patentees.
2999. But do you think a man who patented such a thing as this would be likely to allow a communication of that character to go abroad? I could not answer such a question as that.
3000. I ask you whether it is likely that he would do so? I could not say.
3001. In any case there was no production of any particular authority from the original patentee in this case? There was nothing beyond the communication to which I have already referred.
3002. *His Honor.*] What communication would that be? The invention itself. These persons applied to us as introducers of the patent into the Colony.
3003. That is all, I suppose, that you would usually get? Yes; we recognise the introducer as the author and designer as far as this Colony is concerned.
3004. *Mr. Parkes.*] Supposing M. Monier had some secret formula of strains or anything of that sort which Messrs. Carter, Gummow, & Co. have not, and that M. Monier were to come here and take out letters patent, what effect would that have upon the issue of this patent to Messrs. Carter, Gummow, & Co.? Messrs. Carter, Gummow, & Co. would have patented the invention previously.
3005. But supposing they had patented a system which was not the correct Monier system? Of course it would depend upon what was disclosed in the new specifications and drawings.
3006. Supposing Messrs. Carter, Gummow, & Co. had obtained a patent upon a system which was not the right Monier system, what would happen? If there were any additional novelty in the invention the office, of course, would grant a patent.
3007. And in that case the patent issued by Messrs. Carter, Gummow, & Co. would be superseded? Not necessarily.
3008. How is that? It would be superseded only so far as the improvement was concerned.
3009. As a matter of fact, is not this patent what might be called a pirating of the original patent? I would not say that it was a pirating of the original patent, because the law here admits of an introducer patenting a foreign invention within this Colony.
3010. But supposing the patent turned out not to be the Monier patent at all, would not M. Monier have redress against the Government for the use of part of his patent? Not unless he had patented his invention here.
3011. But suppose that he had patented the complete patent—suppose there was a secret in the original patent, and that Messrs. Carter, Gummow, & Co. did not know of it, and supposing that afterwards M. Monier came here and took out the full patent, would he not have redress against Messrs. Carter, Gummow, & Co. for using part of his patent? I think not, in view of their being the first applicants.
3012. Were any plans produced in connection with this patent? Yes.
3013. Are they here? Yes. They are attached to the grant of the patent.
3014. Was any printed journal produced in connection with the application? No.
3015. Was there any letter? There is a letter among the papers from Mr. Waters, the patent agent.
3016. *His Honor.*] It was through his agency, I presume, that the patent was taken out? Yes.
3017. *Mr. Parkes.*] Was not Mr. Baltzer one of the patentees? Yes.
3018. Was there a transfer to him from anyone? It is not upon our records.
3019. What address did Mr. Baltzer give when he patented this invention? They all gave the same address—"of North Sydney, in the Colony of New South Wales."

Thomas Wright recalled and further examined:—

3020. *Mr. Parkes.*] After you had had the interview with Mr. Davis, which you described to us when you were last here, and when you were endeavouring to get back into your former employ, you went across to North Sydney and had an interview with Mr. Forrest? Yes. T. Wright.
3021. What did he say? He said, "Tom, this is a bad job; on account of your dispute, and the kicking up of a row the other day, I am nearly £40 to the bad in measurements." What he meant by it I do not know. 15 June, 1896.
3022. Did he mean by that that the inspector had forced him to do good work? I do not know what he meant, but that is what he said.
3023. Do you not know perfectly well what he meant? I fancy he meant that there would have been £40 more in his pocket if I had been there.
3024. You also had a conversation with Mr. Carter, or some other member of the firm, in connection with the making of a wager? Not with Mr. Carter; but coming over in the boat, I, myself, made a bet one Saturday evening with Mr. Inwood, the inspector. It was as to the time when the Duke of Edinburgh was here and was shot. I said that it was so many years ago, and he said that it was not. He said, "I will bet you a new hat that it happened at such and such a time, and mind the new hat is to cost half-a-sov." A few days afterwards he came to me to pay me the half-sov. He had blood all about his face. Mr. Forrest afterwards came up and I told him what had happened between Inwood and myself. I thought he was not very well pleased because I took the money, and I said so. Mr. Forrest then told me that he and Inwood had been in a public-house most of the day playing 6d. and 1s. a corner for drinks. He said that he had lost a lot of money to Inwood, and that Inwood afterwards began to cheek him, when he struck him on the face. Mr. Davis came over, and, seeing Inwood's face, asked him what was the matter with him, when he said that he had fallen down a cutting. In another instance a man was at work laying pipes, and Mr. Carter made him a wager of half a sovereign that he could not lay so many pipes in a day. I think it was something like 180. Afterwards the inspector reported that so many pipes had been laid, and Mr. Carter gave the man a half-sovereign.
3025. Did you see him do so? No; but the man who got the half-sovereign told me of it.
3026. Could a man properly lay the number of pipes you mention in a day? Of course he could not; especially if he were working in rock. 3027.

- T. Wright. 3027. *Mr. Davis.*] You said on Wednesday last that you made a complaint as to condemned cement being used upon Contract No. 60 at North Shore? Yes.
- 15 June, 1896. 3028. Did you ever make such a complaint in connection with Contract No. 61? I do not know about the number of the contract, but the complaint I made was that condemned cement was being used.
3029. You made a certain complaint with regard to Contract 60 at North Shore, and you put that complaint in writing;—did you ever make such a complaint with regard to Contract No. 61? I did not mention the Alexandria contract at that time. I meant that bad cement was being used at the other place.
3030. Are you sure that you wrote more than one letter to me? I think I wrote you two.
3031. Did you write to me first of all with regard to Contract No. 60? I did.
3032. To whom did you address your second letter? To you.
3033. Did you address a second letter to the Minister? I did, I think.
3034. And after that did you address a letter to the Hon. J. Davies? No; I gave him the letter to which I referred the other day at the Temperance Hall. I took it to him myself.
3035. Did you write a letter to the Minister, under date January 19th, 1891, commencing with these words:—"I have been working on the sewerage close upon ten years for different contractors," signing yourself "Thomas Wright"? Yes; that is mine.
3036. Can you say that you wrote more than two letters to the Department? I said I wrote two or three letters. I do not know quite how many letters there were.
3037. You wrote one letter to me, one to the Secretary for Public Works, and one to the Hon. J. Davies, did you not? I think I wrote you two letters.
3038. In the letter you wrote to me did you not use these words:—"Sir,—As Mr. Hanlon and Inwood done all they could to deprive me of my work. I charge them with allowing Carter & Co. to use condemned cement all the time at North Shore";—that is your letter to me? Yes.
3039. Does that letter say anything about the use of condemned cement at Alexandria? No.
3040. *His Honor.*] Did you at any time write to Mr. Davis a letter in which you mentioned the Alexandria contract? No.
3041. *Mr. Davis.*] You told us the other day that it was the "Lion" brand of cement that was condemned at the Alexandria Park Works? Yes.
3042. Are you sure it was the "Lion" brand? I am not sure about the brand which was used at Alexandria and which was condemned, but I am sure that it was the "Lion" brand which was condemned at North Shore.
3043. *Mr. Gummow.*] Do you know anything about pipe-laying? I do not know very much.
3044. What is your occupation? I am a carpenter.
3045. Do you know how many pipes a man could lay in a day? I think that if a man laid a hundred, he would do very well.
3046. And how many pipes do you say were laid in the case you referred to? 180.
3047. You are quite sure you know the number? I could not give you the exact number.
3048. On Wednesday last you said that the inspector and Mr. Forrest came to you pretty well drunk;—was that so? Yes.
3049. You are quite sure of that? Very sure.
3050. What did Mr. Forrest say—did he say anything to you? Mr. Forrest and the inspector came along to where we were working. There was another inspector there seeing that everything was done right. When the two of them came down, Inwood drove his foot through the metal, and swore as I told you the other day. When the screen was put up, nothing but clean metal came through.
3051. Was Mr. Forrest there at all? Yes.
3052. You are quite certain of that? Yes.
3053. Do you know on what day that happened? Yes; on the Saturday before Eight-hours Day.
3054. Do you know the year? I think it was in 1890.
3055. You say that Mr. Inwood and Mr. Forrest both came together, and that Mr. Inwood put his foot through the metal? Yes.
3056. Did you answer Mr. Inwood back;—did you say that you would gouge his eyes out with a chisel, and rip his liver out with a sword? No.
3057. You are certain of that? Quite certain.
3058. In your previous evidence you said that when the inquiry was over Mr. Davies turned round to you and said you had no business to interfere with the contractor when he said what he did? That refers to what took place at the Public Works Department, when Mr. Davies and Mr. Bagge were making an inquiry. When it was finished Mr. Davies turned round and told me I had no business to interfere.
3059. With whom? With Inwood, I suppose.
3060. But you said the contractor? I did not mean the contractor. What Mr. Davies told me was that I had no business to interfere.
3061. But with whom—the contractor, the inspector, or the workmen? He turned round and said that I had no business to interfere, and that the contractor had told him of it.
3062. But to interfere with whom? I do not know what he meant.
3063. Did you see the concrete mixed on this job? Yes.
3064. Who mixed it? I know the men by sight, but I do not remember their names.
3065. Did you set up the timber for the putting up of the concrete? Yes; a cask of condemned cement was standing by the inspector when he kicked up the row, but he did not know it.
3066. How did you know it was condemned? All of us over at North Shore knew that it was condemned.
3067. But how did you know? I was there.
3068. But how did you know absolutely that it had been condemned? Word always came in as the cement was condemned.
3069. But how did you know definitely? I was on the job and I knew as well as the rest.
3070. But how? Five times out of six when cement is being tested the men are walking about idle. As soon as the cement is tested they start work again. When they start working it is known whether the cement has been passed or not.
3071. Suppose there happens to be some passed cement on the work, are the men kept idle then? Of course they are kept going while there is cement there to go on with.
3072. You said the other day that three casks of passed cement were put on to a dray with three casks of condemned

condemned cement, and according to what you now say the work would not be stopped while there was any passed cement on the spot ;—now you tell us that the work was stopped? I do not think I said it was stopped. T. Wright,  
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3073. Indeed you did ;—you said just now that the work was stopped for a certain time, and that is how you men knew whether the cement had been passed or not? The work is almost always stopped when the cement is being tested.

3074. But where was the necessity for stopping the work if there was some passed cement there ; you have just said that three casks of passed cement were put on to the dray with three casks of condemned cement ;—you will see that your answers are not consistent? Why, Mr. Forrest himself said the cement was condemned, and that I was not to let the men see it going out of the shed. I was given the key of the shed. There was some rack-a-rock and some dynamite there, and it was not supposed to be used for a long time, until Mr. Davis came over and gave him permission to use it.

3075. Do you, as a matter of fact, know anything at all about the cement that was used ;—do you know whether it was good, bad, or indifferent? I am quite sure it was bad. Mr. Forrest himself said it was condemned, and I was told by him not to let the men see the condemned cement being used.

3076. If Mr. Forrest told you that he was wrong, you also must be wrong in what you say ;—supposing he said the cement was condemned, when, as a matter of fact, it was not condemned? Then what did they take it away for?

3077. I thought you said just now that they used it all? Not all.

3078. Do you know how much cement was used on the job? I do not.

3079. As to the Alexandria contract, will you still swear that condemned cement was used on that contract? Yes.

3080. You said the other day that some of the cement, when Mr. Davis and Mr. Snodgrass tried it, set in fifteen minutes ;—should cement be allowed to be used if it sets in fifteen minutes? It is no good then.

3081. How do you know that? Well, I have seen a good deal of cement.

3082. But how would you get to know that the cement was no good if it sets in fifteen minutes? One gets to know a great many things, but one cannot exactly say how one gets to know them.

3083. What would be the source of your information in this particular case? I do not know.

3084. If the specifications in this contract said that quick-setting cement could be used you would be in the wrong? But it would not be used. The specifications would not say any such thing.

3085. But suppose the specifications did say so? Then those who wrote them would not know what they were writing about.

3086. That is another matter—suppose the specification said so? I do not think any specification would say such a thing.

3087. But if it did? Then I should say that it was no good.

3088. I suppose quick-setting cement would be allowed to be used if the specification provided for its use? If the specification said so, you could use it, no doubt. They could not stop you.

3089. Do you know if any cement was removed from the Alexandria job? Yes.

3090. Was any good cement removed? If it were good it would not be taken away.

3091. You are sure it was condemned cement that was removed? Yes.

3092. As to the bluestone metal of which you spoke in connection with that contract—do you know what good bluestone metal is? Yes.

3093. Do you know what is specified as good bluestone metal? Yes ; I have seen a good deal of it. I think the specification says “clean bluestone metal  $1\frac{1}{2}$  inches.”

3094. Does not the specification say that  $1\frac{1}{2}$ -inch metal can be used screened through an  $\frac{1}{8}$ -inch screen? I do not know about that.

3095. Then you do not know the size of the blue-metal upon this particular contract? I think  $1\frac{1}{2}$ -inch metal was specified,

3096. Does it not say that it was to be screened through an  $\frac{1}{8}$ -inch screen? It was not screened.

3097. Do you know, as a matter of fact, what the specification says in regard to this contract—you seem to know all about it? I do not know about the contract, but I know about the material which was used.

3098. But you say that the metal was too fine? Yes ; there was a lot of rubbish.

3099. And you are sure it should have been  $1\frac{1}{2}$ -inch metal? Yes.

3100. You are certain that that was specified? Yes, upon the Alexandria job.

3101. Do you know the size of the sewer in that contract? I think it was about 7 feet wide, but it was constructed six years ago, and it is hard to remember now.

3102. What height would it be? About 3 ft. 6 in. in the crown, I should say.

3103. It was not 7 ft. 6 in. by 7 ft.? No ; I do not think so.

3104. You were asked the other day whether provisions were made for an invert of 9 inches of concrete in a sewer 7 ft. 6 in. by 7 ft., and if that quantity were not put in whether there would not be a large saving ;—you said that you had thought many times that there was £100 saved in one little place? Yes ; I meant in the cement bed. I think more than £100 was saved in the material.

3105. How did you arrive at that £100? I know by what the material would be worth.

3106. Explain how you arrived at the £100? I could not go into an explanation now. It was worth so much a yard. Perhaps it might be worth 35s. a yard, and I had a rough idea as to how many yards there would be.

3107. How many yards do you suppose? I could not say now.

3108. What is the length of the sewer? I do not know.

3109. Did you not say that this little place to which you refer was about 30 or 40 feet long? It might be more or it might be less.

3110. Take it at 40 feet ;—would it be less than that? Well, all over the sewer there is bad stuff.

3111. But you said that over £100 was saved in the little place to which you refer? When I said that, I meant the sewer itself. From the point where it commences to the point where it finishes it is no great distance. It is only a short sewer.

3112. Do you think, then, that £100 would be saved all over the sewer, or that it would be saved at the little place to which you referred? What I said referred to the sewer. It is only a short bit of work.

3113. You mean the whole work, not a little bit of it? Yes.

3114. You said the other day that if the sewer were open you could show easily enough where this bad work

- T. Wright. work was;—what is the difficulty of your showing us now where it is to be found? Well, it is all covered up now.
- 15 June, 1896. 3115. Take the 30 or 40 feet to which you referred so strongly;—could you not find that spot? You could find it yourself. I told you that it was at the very end of the work. If you followed the work up from the end you would find that all I have told you is true.
3116. Do you think you could find the spot? I think I could go very near it.
3117. Is there a branch sewer coming in near the spot? Not that I know of.
3118. Did you not build the moulds in connection with the bringing in of a branch sewer? The work itself ran into an old sewer, and finished near the Chinaman's garden.
3119. But did you not make moulds for a branch sewer? No; it was a pipe sewer running into the side of it.
3120. It was not a concrete sewer? No; not at the time I was there.
3121. You are sure you did not fix up moulds to go into a concrete sewer there? Where the pipes came in there might be a little concrete round about them, but I could not tell you how much.
3122. Did you fix up the moulds in that 30 or 40 feet to which you have referred near the outlet? I think so. But one day I was on the North Shore job, and another day somewhere else. It is possible that some one else fixed some of them, but I could not say definitely.
3123. With regard to the pegs, you said the other day that thirty or forty pegs had to be shifted. In answer to His Honor you said that as you went down the sewer you found it necessary to drive in some of the pegs? The pegs had to be driven in where there was no room for the mould.
3124. You said that thirty or forty pegs had to be shifted? If I said that I said what was wrong. What I meant to say was that the pegs were in no depth—that they were striking up through the concrete—through the bottom of the sewer. The pegs are allowed to stop there until you fill in the top.
3125. What did they drive the pegs into? The ground.
3126. What sort of ground was it? Soft ground.
3127. These pegs were standing up in it? Yes; or you would not know where to go. There was a 9-inch bottom of concrete, and it had to go in in two layers about  $4\frac{1}{2}$  inches each. These were supposed to come up to the top of the peg.
3128. Are you prepared to swear that this 9-inch bottom was put in in two layers? I am prepared to swear that in some instances the second layer could not go in simply because there was no room for it.
3129. But where there was room, you say that the 9 inches had to go in in two layers? Yes; I think there was  $8\frac{3}{4}$  inches of concrete altogether.
3130. And did you see that go in? I think I saw most of it.
3131. Was there nothing below the  $8\frac{3}{4}$  inches of concrete? I cannot be sure. The reason I cannot answer all your questions is that I was at Alexandria one day and at North Shore the following day.
3132. Was the concrete on rock or sand? I could not say.
3133. But if you were setting the moulds you would know, would you not? All the bottom was in before I went in at all.
3134. You said that when you were putting up some of the moulds you found there was room for only a half thickness of cement? Because the bottom was too high.
3135. But did you know the thickness of concrete below—did you test it below? No; I did not.
3136. Then how do you know how much concrete was there? Well, there should have been two layers of about  $4\frac{1}{2}$  inches each, one on top of the other.
3137. Did they not go in? I do not know. If they did, they did not come to the top of the pegs.
3138. Would they be able to drive a peg through the concrete? Not a wooden peg.
3139. But you did not test the depth of concrete, so as to be able to say definitely that there was no  $8\frac{3}{4}$  inches there? I had to chip some of it off, and I fancy, from what I saw at some places, that the pick was nearly through.
3140. But you did not get through? No; but I was very near it.
3141. There might have been 6 inches underneath those places? You can easily try it.
3142. Could you find the place at which we could try it? Yes.
3143. In answer to His Honor, the other day, you said you knew of this bad work by testing it yourself? Yes.
3144. You were working on the top of the bluestone concrete? Yes.
3145. Then you must have tested it to ascertain the actual depth? I did not say I tested it.
3146. Then what did you mean by telling His Honor that you had tested it;—you said you knew the bad work by testing it yourself? Well, the tests were these: I had to pick the top off to get room for the moulds, and I knew that the bottom could not be of any thickness at all.
3147. How did you know that? I did not go right down to the bottom as I have told you, but I knew.
3148. You knew the thickness of the concrete? I could not tell you to a quarter or half an inch, but I had a good idea.
3149. What we want to know is whether there were 9 inches or 3 inches, or what depth there was? I do not believe there was more than 3 inches in many places.
3150. How do you know that? I am telling you what I think.
3151. But why could there not have been a greater depth? From working on the top with my pick, I did not think the concrete was of the required thickness.
3152. You said just now that you knew it was not? Well I knew, and I did not know. I knew the thing was not properly done as it should be.
3153. What do you mean by saying that you knew and you did not know? Well; I knew that things were not all right.
3154. Can you swear that there was not a depth of  $8\frac{3}{4}$  inches? I will swear that there was not 9 inches.
3155. *Mr. Parkes.*] Do you remember the name of the cement which was condemned on the Alexandria contract? I should not like to state the brand definitely in the case of that contract.
3156. Was it what is known as Red Hand cement? I do not know.
3157. You said just now in reply to Mr. Gummow that the sum of only £100 was saved, and that the sewer was only of very short length—do you know what length it was? It is a short sewer altogether.
3158. About how long would it be? Perhaps 3 or 4 chains long.
3159. Do you mean the portion of the sewer upon which the bad work was done? I mean that about £100 worth of stuff was saved upon what they did.
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3160. But how many chains would that be, roughly speaking? I do not know.  
 3161. Would it be 2 chains? More than that; it might have been 5 or 6 chains.  
 3162. You said in your former evidence that you had, in putting the moulds in, to knock the pegs down some inches into the ground? Yes; the pegs were sticking up through the bottom.  
 3163. And they were measured for a depth of concrete of about 9 inches? Yes; I believe I broke the first peg off to get the moulds down on to it.  
 3164. How far apart were the pegs? I believe they would be 20 or 30 feet apart.  
 3165. And how many did you break off or knock down? I could not say. Perhaps four or five of them. It might be more, or it might be less.  
 3166. In picking away at any of these places to get the moulds in, did any of the concrete give way, or how could you tell there was a thickness of only 3 inches at places? By the way it chipped. I could tell from the tapping. I had some idea from the quantity I took off.  
 3167. As a matter of fact you knew that the pegs should have measured a depth of 9 inches? Yes. They give the depth of stuff which is supposed to be put in.  
 3168. When you came to put in the moulds, did you find the pegs of uniform height? Yes.  
 3169. And you had to knock them in to get in the moulds? Yes.  
 3170. You told Mr. Gummow just now that sometimes you were at North Shore and sometimes upon the other work? Yes.  
 3171. But on the portion of the work of which you have spoken you fixed the moulds yourself? Yes.  
 3172. All of them? I think so.  
 3173. Did anyone fix the moulds further on? I am not quite sure; but I think one of the inspectors on the job had a son, and I think his son came and fixed a mould.  
 3174. Was that a Government Inspector? Yes.  
 3175. And you say that the son of this Government Inspector came and fixed a mould? Yes; I fancy he did.  
 3176. What was his name? Clymer, I think. I believe he was a builder at one time. He lived at Balmain.  
 3177. What street did he live in? I cannot say.  
 3178. When you were knocking down the pegs on which you have spoken in order to fix in the moulds, did you notice whether, further on, the pegs needed knocking down? Further on they did not need knocking down. They came all right.  
 3179. How far on? I could not say.  
 3180. If condemned cement was used, and if an insufficient quantity of concrete was being put in under the sewer, surely there would have been a saving of more than £100 upon the total length of it? What I meant was that £100 would be saved from part of the bottom being left out. Then, of course, there is the bad stuff to be considered. The metal itself was very bad. I believe it would go about 30 feet to a banker.  
 3181. Was young Clymer an employee of the contractors. I do not know. I never saw him doing the work, but it runs in my head that he did something there at one time when I was at North Shore.  
 3182. With reference to the total saving effected by the bad work put into the sewer, do you not think that if you allow for the bad material it would be likely to come to more than £100? I am confident that it came to that amount anyhow.  
 3183. As a matter of fact you could not form an idea as to how much was saved? No, I could not.

Robert Rowan Purdon Hickson, recalled and further examined :—

3184. *Mr. Parkes.*] Contract 112, M'Sweeney's contract, was for a triplicate sewer? Yes.  
 3185. I understood you to say the other day that the original departmental plan of Contract No. 77 would cost about the same as Contract No. 112 per foot run? I am having prepared the length and cost of several of the contracts you have referred to. The information will be available presently.  
 3186. What is the tender cost of M'Sweeney's 112 Contract? It is a schedule-rate contract.  
 3187. Does it not work out at £17,300? I do not know. It was accepted at schedule rates.  
 3188. Was not Mr. M'Sweeney right the other day when he said that it would work out at between £17,000 and £20,000? I could not say without seeing the papers.  
 3189. While Mr. M'Sweeney was giving evidence the other day with reference to Contract No. 112 you asked him whether he was not aware that he had nothing to do with the Monier plates, and that the office had to buy them and to pay the royalty? The office would have provided them had they been used.  
 3190. Would the office have had to pay the royalty? If the plates had been used, certainly.  
 3191. Would that amount have had to be paid outside of the contract? Yes; but we did not use them at all, so that the question does not come in.  
 3192. If they had been used the office would have had to pay for them outside of the price of M'Sweeney's contract? They were put into the contract in the first instance, and afterwards taken out.  
 3193. They were taken out by Mr. Darley, I believe? No.  
 3194. Did not Mr. M'Sweeney say they were taken out by him? He did at first, I believe, but he afterwards corrected himself. He said finally that they were taken out by me. As a matter of fact it was I who took them out of the contract.  
 3195. Did you not write a minute to the Secretary for Public Works when this contract was being tendered for, and before this tender was accepted, in these terms :—"I would point out that the specification, under clause 25 of the general conditions, throws the whole of the responsibility for the patent rights on to the contractors"? Yes; if there were any patent in the contract.  
 3196. But that was written with reference to a query as to the patent rights? Yes.  
 3197. Therefore you told the Minister that the contractor was responsible, and that he would have to pay for the patent rights? If it were a patent, but there was no patent in the arch. That was the point under discussion at the time.  
 3198. In the discussion which took place about the putting of the Monier patent in the arch, in order to reassure the Minister, you wrote the minute containing the words I have just quoted? That is quite right, but there was none of the patent used.

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3199. Then why did you take out the patent after the contract was signed? You are confusing two things. There is no Monier patent in the arches.

3200. Were Monier plates used in the contract anywhere? There were a few, and the discussion arose upon a claim made by the contractors for patent fees upon the whole of the structure. I pointed out to Mr. M'Sweeney verbally that the patentees, in my opinion, had no right to claim any royalty, because there was no patent used in the work, but that if they could substantiate their claim, then, under the general conditions, the contractor would, of course, have to bear the cost.

3201. *His Honor*] Are the few plates you have spoken of plates covering the top of the carrier? They were a substitute for the ordinary covers to, I think, a sump. I thought we might advantageously use these plates. Sumps are generally covered with iron plates, and I thought we would try a few of the Monier plates instead. Rather than raise the question of royalty, however, I struck them out altogether and went back to the old system.

3202. The Monier plates are those shown upon drawing No. 4? Yes. The plates are intended to cover little recesses at the shore end of the abutment.

3203. For what are the recesses intended? They are merely put there for lightness.

3204. Under the invert of the carrier? Yes.

3205. The plates which cover the aqueduct were not upon the Monier principle? No, certainly not.

3206. *Mr. Parkes*.] Then why could you not have used the same method of construction in Contract No. 77? We could have done so, most undoubtedly.

3207. Therefore, there was no need for you to pay the royalty upon this patent? There was need from my point of view to introduce the new system when I could do so at no extra cost to the Department, the whole risk being borne by the contractors.

3208. You say that the minute from which I have quoted was written upon the dispute occurring between the contractor and the patentees? Yes; I was under that impression.

3209. Was it not, as a matter of fact, written when you were submitting tenders to the Board of Reference? I could not say till I see the papers. I see that a minute was written when the tenders were submitted.

3210. And not when the dispute with Mr. M'Sweeney occurred? No. But I knew that the claim had been made by the patentees in connection with their patent.

3211. Did you know that when you put these Monier plates in? No. I knew that the patentees claimed that the carriers into which we introduced the iron bars were on the Monier principle.

3212. Did you know before the contract was let that the patentees would make a claim? I could not say that, but I knew of it very early in the transaction.

3213. When you submitted the tenders to the Tender Board you knew that the patentees would make a claim? Yes.

3214. Before the contract was let? Yes.

3215. Then why did you not before letting the contract take the Monier plates out—why did you wait until Mr. M'Sweeney made his protest before you took them out? The few plates were not worth speaking of. They were a very small portion of the job.

3216. *His Honor*.] I understood one of your answers just now to have reference to the iron bars in the carriers? Yes; that is another matter.

3217. *Mr. Parkes*.] They do not belong to the Monier system, you say? No.

3218. Nevertheless the Monier patentees were about to make a claim upon the whole of the job? Yes.

3219. *His Honor*.] What was done in relation to the part of the claim affecting the bars in the carrier;—they were allowed to remain, were they not? Yes. My contention always was that they did not constitute the Monier patent, and that the patentees had no right to a royalty upon them.

3220. The Monier patent, as you understood it, being confined to the building of arches? No; it is the way in which the iron is introduced into the concrete.

3221. In the form of a grill? Yes; it would be absurd to say that you could not put an iron bar into a concrete structure without having to pay a royalty on the Monier patent. This is exactly a parallel case. We put iron bars in about 3 feet apart, and my contention was that that was not the Monier patent in any form.

3222. As to that matter, is it or is it not a fact that a great many years before the Monier patent was heard of the Americans had adopted a plan of laying railway irons in a concrete foundation to stiffen it? Yes; I had done so myself long before I knew there was such a thing as the Monier patent.

3223. That would explain your contention that the mere putting of bars into concrete work would not justify the Monier patentees in making any claims in respect of that work? Yes.

3224. It is the grill-work which is the peculiarity of the Monier patent? Yes; that is a part of it.

3225. *Mr. Parkes*.] This aqueduct has to carry a great quantity of water and a great weight as compared with the aqueduct in Contract 77? Yes.

3226. Then a greater strain would be upon it? The greater the volume the greater the strain, of course.

3227. Then why could you not have applied this principle to Contract 77 instead of applying the Monier patent to it? Because I thoroughly believed in the Monier system. And I had an opportunity to introduce it at no loss to the Department, while throwing the whole risk upon the patentees. Under those circumstances I think I was quite justified in doing so.

3228. Is it done entirely at the risk of the patentees? Entirely.

3229. Then the Department is not supposed to pay the patentees risk fees or anything of that sort? I do not know what you mean by paying risk fees.

3230. Let me put the question in this way—if the Department were negotiating with the patent-holders to use a certain patent, you would not expect the Department to pay for the risk of that patent? If I were calling for tenders on the Monier principle, I should make the Department liable; but if the contractors offered to do the work upon the Monier principle, they would be liable for the risk. That is why I would not call for tenders. Had I done so, I should have had to prepare my own designs, and the Department would have been responsible for the work.

3231. Was not the design of Messrs. Carter, Gummow, & Co.'s Monier arch work in Contract 77 made in your office? Not to my knowledge.

3232. Was it not made by Mr. Baltzer? Not to my knowledge. I am almost certain it was not done in office hours. I am sure my chief draughtsman would not have allowed such a thing as that to take place.



3233. Was Mr. Baltzer your chief draughtsman? No; Mr. Hammer. He was immediately responsible to Mr. Bagge, and I am sure neither of them would allow anything of the sort to take place.

R. R. P.  
Hickson.

3234. I see you now have the paper of which you were speaking, showing the total length and cost of Contract 112 and other contracts;—what would be the total cost of 112? There is no contract cost. The estimated cost upon which the tenders were compared was £17,362, I think.

15 June, 1896.

3235. *His Honor.*] Do I understand that that is the office estimate reduced by the tender percentage? That is our estimate of the work carried out on the contractor's schedule rates, but it is not the contract sum. It might be exceeded by (say) £4,000 or diminished by £4,000.

3236. *Mr. Parkes.*] With extras, you mean? No. It is not a question of extras, but when the whole work is measured up, instead of there being 50 yards of brickwork, there might be only 40, and so forth.

3237. Upon what did you base your replies to His Honor's questions the other day concerning Contracts Nos. 112, 101, and 77;—practically, what you said to His Honor was that there was no difference between Contract No. 77 and Contract No. 112—that they stood at almost the same cost? Yes; very much the same.

3238. You did say that? Yes.

3239. That, I suppose, would be taking the departmental plans? Yes.

3240. On what did you base your estimate per foot? On the office quantities we took out when we were making the estimate in the first instance.

3241. Did you not base your answer on the actual cost? How could I give the actual cost when the work was not finished?

3242. The estimated cost of No. 112, you say, was £17,362, taking the office estimate reduced by the contractors' tendering percentage? Yes; but that is not the contract amount.

3243. What is the length of the contract? 2,625 feet.

3244. That aqueduct is to carry the capacity of the three 6-ft. pipes flowing into it? No.

3245. Does not John Ahearn's Contract No. 101 join this aqueduct? Yes.

3246. Does not that carry three 6-foot pipes? Yes.

3247. Does not that discharge into this one aqueduct? A portion of it does. The rest goes out in two distributing sewers—one to the right and one to the left. They are not constructed yet. There is no sewerage coming down so far.

3248. Now let us take the dimensions;—is not the aqueduct in Contract 112 8 ft. 8 in. by 4 ft. 6 in. deep? No.

3249. Do you mean to say that it is not 8 ft. 8 in. in width? On the top.

3250. Is it not approximately 4 feet in depth? I suppose it would be about 4 feet.

3251. Then it is 8 ft. 8 in. by 4 ft.? No, it is not. The aqueduct diminishes in size as it goes down. The average would be about 8 feet. You might say that it is 8 ft. by 4 ft.

3252. What are the dimensions of the aqueduct proposed over White's Creek and Johnstone's Creek? Smaller, of course.

3253. Is it not 4 ft. 6 in. by 3 ft. 6 in.? Four feet 6 in. in the deepest part of it, and 3 ft. 6 in. in the widest part.

3254. Therefore, it has but one-half the capacity of the other aqueduct? Yes.

3255. It would be a fair thing to say that it should be made for about one-half the cost? Certainly not.

3256. Why not? It is such a silly question that it is hard to answer it.

3257. *His Honor.*] Have you any formula by which you can approximately give the relation between cost and capacity—the capacity of the carriers, and the running cost of the aqueduct, at a given height, of course, above the ground? Not at all accurately. The question that was put to me by Mr. Parkes was whether, supposing the sewer in Contract No. 112 to be double the capacity of the sewer in Contract 77, was it fair to say that the cost of No. 77 sewer should be one-half the cost of the sewer in Contract 112, and I say that that is absurd.

3258. Have you any idea of the ratio? Not in proportion to the decrease in size. For instance, suppose that a carrier 10 feet wide costs £10 a foot, if you reduce the width to 1 foot you would find that it would cost a great deal more than £1 a foot to construct the carrier at the reduced width.

3259. *Mr. Parkes.*] I believe you desire to make some rather important corrections in some of your replies to my questions. Question and answer No. 1252 are as follows:—

1252. Did you not use words to this effect, "Does Mr. Bagge know anything about this patent"? I used those words, because I knew that he had gone into the question. As a matter of fact, I had at that time put up a small culvert on the Parramatta Road on the Monier system.

I believe that what you now wish to say is that instead of your having at the time you referred to put up a small culvert on the Parramatta Road on the Monier system, what you now desire to say is that you had arranged to put it up? Yes. If you read the evidence a little further on you will see that I corrected myself, because I there say that I had arranged to put it up.

3260. Did you not, on the 18th July, 1894, write in the following terms to the Minister: "The Monier system of concrete arching has been patented in the Colony by Messrs. Carter & Co. Where applicable, it reduces the cost of spanning an opening by about 50 per cent. The patentees are willing to allow the Department to use the patent on payment of a royalty of 15 per cent. on the cost of the arch. I recommend this for the Minister's approval. I might state I have just completed, with the permission of the patentees, a culvert on the Parramatta Road, built on this principle, with most satisfactory results, financially and otherwise"? Yes; I wrote that on the 18th July, 1894.

3261. And on the 5th April, 1893, you asked Mr. Bagge the following question: "Does Mr. Bagge know anything about this patent"? Yes; that was on the 5th April, 1893.

3262. The letter which I have quoted having been written on 18th July, 1894, I presume that at that time the bridge was being constructed? I forget the date at which the bridge was constructed at this moment, but I daresay I can get it for you.

3263. I understand that you also desire to make a correction in your evidence at Questions 1361 and 1362. They are as follow:—

1361. You say these estimates are carried out upon a triplicate-sewer plan? Yes; all these three schemes.

1362. And is Ahearn's based upon a triplicate system, too? Yes.

I ought to point out to you that my Question 1361 should read "duplicate-sewer plan" instead of "triplicate-sewer plan," and that the word "triplicate" in Question 1362 should also be "duplicate"? Well, Mr.

- R. R. P. Hickson.  
15 June, 1896.
- Mr. Bagge's schemes Nos. 1, 2, and 3 are for single carriers. So far as Question 1362 is concerned, of course, if you alter the word "triplicate" to the word "duplicate," my answer would be "No."
3264. Then what is the meaning of Mr. Bagge's report when he says: "Three designs are herewith submitted for the consideration of the Engineer-in-Chief, each design with an open aqueduct carried upon arches and piers. The aqueduct or main carrier is capable of discharging 11,000 cubic feet of sewage per minute, which is equal to two 6-foot diameter outfall sewers";—should you not say from that that Mr. Bagge's report was based upon the discharge of two sewers; I suppose the office work was the only thing upon which a comparison could be made at that time? Certainly not; three designs were submitted by Mr. Bagge for the consideration of the Engineer-in-Chief. These three designs were for single carriers, not for triplicate or duplicate carriers.
3265. Then I ask you is Ahearn's contract a duplicate system? No; that is a triplicate system.
3266. Is it not calculated in Mr. Bagge's report as a duplicate system? I think Mr. Bagge did in a footnote refer to it as a duplicate system.
3267. *His Honor.*] Although there was a triplicate system up to a certain point, the line of sewer was continued with a discharge which reduced the necessary carrying capacity of the extension to that of a duplicate sewer? There was an extension of the three-sewer system; but it was not proposed to carry the same amount of sewerage as would be carried in the three sewers.
3268. The extension was supposed to carry the contents of two 6-foot sewers? As a matter of fact, it would only be required to carry a little over that, because at the intersection there are branches to the right and left to distribute the sewage over the sewerage farm.
3269. You are referring now to M'Sweeney's contract, following upon Ahearn's? Yes.
3270. Then, if we know the actual capacity of the single carrier in M'Sweeney's case, we shall know how far it was an extension of the preceding line of sewer, or what the reduction was? Yes.
3271. *Mr. Parkes.*] With regard to your answer to Question 1385, I asked you how Mr. Young came to tell the House that your son had left some months before the meeting of Parliament, and you said in reply to me, "He made a mistake in saying months; he should have said weeks";—I believe you wish to correct that statement by striking out the words "he should have said weeks"? It is not very material. Strictly speaking, weeks is correct, because it was five weeks before that that my son got notice to leave.
3272. *Mr. Gummow.*] With regard to the Monier plates in Contract 112, which have been referred to, had Mr. M'Sweeney to supply them? No; they would have been supplied by the Department.
3273. What had Mr. M'Sweeney to do with them? He had to put them in.
- 3274-5. Would he have had to pay a royalty simply for putting them in? No; I have already said that he would not.

WEDNESDAY, 17 JUNE, 1896.

Mr. Robert Rowan Purdon Hickson recalled and further examined:—

- R. R. P. Hickson.  
17 June, 1896.
3276. *His Honor.*] You were asked some questions the other day with reference to the area of various carriers? Yes; the area of the carrier in Contract 112 is as nearly as possible  $31\frac{1}{2}$  feet when full. The area of one 6-foot sewer when full is  $28\frac{1}{2}$  feet, so that the area in Contract 112 is only 3 feet more than the area of the one sewer in Contract 101. Flowing as they are supposed to do at the maximum of two-thirds full the area is as nearly as possible the same in both cases.

Mr. Peter Ewing sworn and examined:—

- P. Ewing.  
17 June, 1896.
3277. *Mr. Parkes.*] What is your occupation? I am a contractor.
3278. Some eighteen months ago you were a member of the firm of Carter, Gummow, & Co.? Yes.
3279. There was a partnership deed, was there not? Yes.
3280. Some time in June, 1895, I believe you had a conversation with Mr. Carter near the Bank of New Zealand? Yes.
3281. What did Mr. Carter tell you? Mr. Maddison asked Mr. Carter if it were true that Mr. Hickson, jun., had been engaged by the firm, and Mr. Carter said "Yes." Mr. Hickson, he said, wanted to join the firm, but he had told him that he had better wait two or three years.
3282. Join in what capacity or how? Mr. Carter simply said that Mr. Hickson wanted to join the firm, but that he could not do so for some years, although he would be taken on as an employee.
3283. Had you need of Mr. Hickson as an engineer at that time? There was not much work going on at that time. There was only the Adelaide job.
3284. What salary was he paid? I could not say. I was told £200 a year.
3285. *His Honor.*] Who told you that? Carter.
3286. *Mr. Parkes.*] From what Mr. Carter said to you you were under the impression that Mr. Hickson, jun., was ultimately to be a partner in the firm? We did not inquire very much about those affairs. Mr. Maddison and I met Mr. Carter, and asked him if it were true that Mr. Hickson, jun., had been put on to the work. He said that it was true that Mr. Hickson, sen., wanted his son to join the firm, but that he had said he had better wait for two or three years.
3287. Did Mr. Hickson, jun., discharge any duties for the firm? I never saw him discharge any on this side, but he may have done so in Adelaide.
3288. Was he of any use at all to the firm? That I could not say.
3289. After becoming an employee of the firm did he go direct to Adelaide? I think so.
3290. Who were the partners of the firm who were in Adelaide? Mr. Gummow and Mr. Gillan.
3291. Later on Mr. Gillan returned to Sydney? Yes.
3292. Did young Mr. Hickson return with him? I do not think so.
3293. When did Mr. Gillan return? I do not know.
3294. Do you know whether young Mr. Hickson came to Sydney at any time at about the same date as Mr. Gillan? I only knew of his coming over from Adelaide once before he came over permanently.
3295. But he had been in Sydney once before that, you say? Yes.
3296. You had a conversation with Mr. Gillan, had you not, when he came to sign a bond? Yes.
3297. What did he tell you? He asked whether we had been asked anything about putting young Mr. Hickson on the works. I said we knew nothing about it until he was put on. He said he had seen a telegram from Sydney dealing with that particular point. He did not say what the telegram was.

P. Ewing.

17 June, 1896.

3298. Did he not say what the wording of the telegram was? No; I never asked him.
3299. When you left the firm of Carter, Gummow, & Co., on what date was the bond signed? I do not know. Mr. Maddison has a copy at home.
3300. *His Honor.*] Where is the original, do you know? I cannot say. We saw it, and that was all. It was signed at the "Australia Hotel."
3301. *Mr. Parkes.*] Did you understand that there was to be a lasting partnership? Yes.
3302. Does not clause 20 of the agreement say, "Upon the completion of all the contracts for the time being in hand, or upon the happening of any event rendering it impracticable for the partnership to carry out and complete the same, whichever shall first happen the partnership shall be dissolved, and a general account taken of the assets and liabilities of the partnership, &c."? I never heard it read before, and I never read it.
3303. There can be no doubt that that deed of partnership was drawn up in respect of all contracts which were going on? Yes; we were supposed to put in so much money, which was to go for certain works.
3304. Will you tell me whether Mr. Gillan and Mr. Forrest were contractors upon any works in this Colony prior to April, 1895? Yes; we tendered for work together, and we signed contracts together.
3305. Will you tell me why you desired to leave this firm? Well, we could not get on very well together. Things were not going so as to suit me, and so I left them.
3306. Since you left the firm, have you had any Government contracts? I have tendered several times.
3307. But you have found it very difficult to get contracts? I could never get near them at all.
3308. *His Honor.*] I suppose that what you mean is that you did not tender low enough? No.
3309. *Mr. Parkes.*] You were one of the party of contractors who waited on me some twelve months ago? Yes.
3310. What did you request me to do at that time? We wanted everyone to have a fair opportunity of tendering.
3311. What did you tell me at that time? That we thought that everyone should have a fair show in tendering.
3312. But what was the object of the deputation of contractors which waited upon me;—what did they say to me? As nearly as I can remember it was this—that a lump sum contract had been accepted upon what was known as the Monier job, and we thought that it was not right for any firm to put in a lump tender when schedule rates had been issued for the work.
3313. Were there no other reasons which you gave for waiting upon me? I do not know of anything else.
3314. Was nothing said about the impossibility of contractors obtaining contracts because of the concessions which were given to Messrs. Carter, Gummow, & Co.? I was not there the first time they waited upon you. I was there the second time.
3315. *His Honor.*] Then there were two deputations? Yes.
3316. And you attended with the second one? Yes.
3317. *Mr. Parkes.*] On the first occasion I declined to do anything until I had made inquiries, and on the second occasion I made the contractors lay certain matters before me;—is not that so? Yes; the contractors did not think that the matter of the Monier tender had been properly dealt with.
3318. Were no other matters laid before me;—do you not recollect other matters being laid before me in connection with other contracts? I forget now what they were.
3319. *His Honor.*] Who was the spokesman at the deputation at which you attended? There were several spokesmen.
3320. Did you yourself say anything? I said I did not think the Government had any right to call for tenders at special rates, and on the top of that to accept a lump sum tender, because that did not give the other contractors a fair chance at the tender-box.
3321. *Mr. Parkes.*] I suppose there is no doubt about this—that if you had had a chance of tendering you and the other contractors could have done the Monier work? I did not go into the matter, but I am sure there are plenty of contractors who could have done it.
3322. You had no chance of tendering upon the Monier plan? I did not go into the matter at all. I did not think it worth while.
3323. But were you given a chance at all to tender from that plan? As far as I could hear, a lump sum tender was to receive consideration, and, that being so, it did not look as if it were worth the while of anyone else to try for the work.
3324. *His Honor.*] Before you sent in your tender at all did you hear anything about the Monier system being likely to be tendered for;—had you any opportunity yourself of sending in a tender upon the Monier system founded upon the departmental plans and schedules? It was of no use to tender.
3325. But you had a chance if the plans were given to you? The plan given to us was a different thing altogether.
3326. *Mr. Parkes.*] You never saw the substituted plan of No. 77? No.
3327. Did you tender for Contract No. 101? I do not recollect.
3328. Were you a member of the firm when Mr. Hickson, junior, came back from Adelaide? No.
3329. Upon all contracts which which were going on under your partnership deed you had an interest in common with the others? Yes.
3330. Messrs. Carter, Gummow, & Co., did not draw up separate deeds for each job? No.
3331. After you had brought this matter of Messrs. Carter, Gummow, & Co.'s before me, at the instigation of a number of contractors, you had a conversation with Mr. Carter, had you not? Yes.
3332. Where did that conversation take place? Down near the Bank of New Zealand.
3333. What did he say to you? He asked me if I remembered the conversation that we had had before.
3334. And what did you say? I said that I did.
3335. *His Honor.*] What conversation was that? About putting Mr. Hickson, junr., on at the start-off.
3336. *Mr. Parkes.*] There was no further conversation? No.
3337. When did that happen? I could not say the exact date.
3338. Would it be after October, 1895? Yes.
3339. *Mr. Smith.*] Besides the deed which you have just seen, was there any other deed of partnership? There was a similar deed between Mr. Gillan, Mr. Maddison, Mr. Gummow, and myself.
3340. When was that signed? They were both signed on the one day.
3341. The first of the two conversations with Mr. Carter which you have referred to took place at the Bank of New Zealand? Yes.

- P. Ewing. 3342. And that you say was about June, 1895? It was at the time that Mr. Hickson, junr., went over to Adelaide.
- 17 June, 1896. 3343. When he was first engaged? Yes.
3344. *His Honor.*] Cannot you fix the date approximately? It must have been in 1893, I think.
3345. *Mr. Smith.*] At that time you had a contract in Adelaide? Yes.
3346. The deed to which you have already referred is dated 25th August, 1892;—it refers to the fact that you had already entered into a contract with the Government of South Australia for the construction of certain works in or near Adelaide called Contract No. 60? Yes.
3347. You knew that Mr. Hickson, junr., was to be employed on that Adelaide job? After he was engaged—yes.
3348. You have said, I think, that you never saw him on the works here? I have seen him on a visit here, but not doing any work.
3349. When was it that you saw him here on a visit? I could not exactly say. He was having a holiday at the time, I think.
3350. And that was the only time that you saw him here at all? Yes.
3351. I think you told us that on the occasion on which Mr. Gillan came up to Sydney Mr. Hickson did not come up with him? He might have done so, but I did not see him.
3352. Who were the other contractors who waited with you upon Mr. Parkes;—kindly mention a few of the names? The biggest part of the local contractors were there. There were O'Neill, Rhodes, Butcher Bros., Gilliver, and Maddison.
3353. By Maddison you mean your partner? Yes.
3354. And all that you can remember is that you objected to this lump sum tender being accepted in regard to Contract No. 77? Yes.
3355. That is all you can tell us with regard to the objections which you put before Mr. Parkes? Yes.
3356. I think you said that you and other contractors could not get near the contracts now? Yes.
3357. You sent in a tender for the particular contract in respect of which a lump sum tender was afterwards accepted? Yes.
3358. What was your figure? It was  $8\frac{1}{2}$  per cent. below the Government schedule.
3359. Did you know the tender price of Messrs. Carter, Gummow, & Co.? Yes. It was  $28\frac{1}{2}$  per cent. below the schedule rates.
3360. So that there was 20 per cent. difference between you;—did it not occur to you that that perhaps was the reason why you could not get near the contract? We knew that if a lump sum tender were to be accepted we could not get near the contract at all.
3361. I suppose other contractors tendered for No. 77? Yes.
3362. And their tenders were all above the tender of Messrs. Carter, Gummow, & Co.? Yes.
3363. You say Mr. Carter told you that Mr. Hickson, junr., wanted to become a partner, but that he had told him that he would have to wait for two or three years? Yes.
3364. Beyond that you never heard any suggestion as to Mr. Hickson becoming a partner? That is all the conversation I had in reference to it.
3365. As a matter of fact, he never was at any time a partner? Not that I know of.
3366. If there had been a partnership under a deed you would have known of it? Yes, according to the deed.
3367. You signed this deed, did you not? Yes.
3368. I wish to draw your attention to the first clause, "The parties hereto will become and remain partners under the name, style, or firm of Carter, Gummow, & Co., in the trade or business of contractors, for the purpose of carrying out and completing the contract hereinbefore referred to, and any other contracts which the said parties shall mutually agree upon and shall obtain"—it is, therefore, clear to your mind that this is a partnership agreement relating only to the Adelaide contract, or any other contract upon which the parties shall mutually agree? Yes.
3369. As to clause 20, "From the completion of all the contracts for the time being in hand, or upon the happening of any event rendering it impracticable for the partnership to carry out and complete the same, whichever shall first happen, the partnership shall be dissolved, and a general account taken";—that, I presume, refers to the contracts in hand when the partnership was agreed upon? Yes.
3370. It is provided that when those are completed and the partnership is to be dissolved an account is to be taken? Yes.
3371. So that apart from the Adelaide contract the deed relates only to those contracts upon which the parties shall mutually agree? Yes.
3372. It leaves the parties entitled to go into any other contracts outside if they like? I do not know about that.
3373. As a matter of fact, did any of the parties do so? If money is to be found I do not think that could be done, could it.
3374. As a matter of fact, did any of those persons under this partnership deed go into any contract outside it? I do not know that they did.
3375. This is a partnership which was dissolved in April, 1895? Yes.
3376. *Mr. Gummow.*] I understood you to say that at the time you signed this particular deed you signed another deed of partnership? Yes.
3377. Were Messrs. Carter, Snodgrass, and Forrest in the other deed of partnership which was drawn up? No; I think not. You signed it, and said that it was just the same as the other one.
3378. Do you know whether Messrs. Snodgrass, Carter, and Forrest were in the other deed? No.
3379. If there was a general partnership, would it be necessary to have another partnership deed between us? Yes; if we found the money. It was necessary to have an agreement between Messrs. Maddison, Gillan, myself, and yourself.
3380. Can you tell me the date of the deputation which waited upon Mr. Parkes at which you attended? No.
3381. Was it after Mr. Parkes' first speech in the House? I think it was just after one of the speeches. I attended upon the second deputation. I was away when the first deputation waited upon him.
3382. Did you ever mention to Mr. Parkes that you had seen a telegram which had been sent by Mr. Carter to Adelaide? I was told there was one.
3383. Do you know what was in it? I do not.

3384. Did you ever see a copy of it? No.

3385. You and Maddison were often together, I suppose, talking over this and other matters? Yes.

3386. You were in daily communication with one another at this time? We were pretty often together.

3387. If Mr. Maddison had had such a telegram as that referred to, do you not think it likely that he would have shown it to you? He might have done.

3388. *Mr. Smith.*] In reply to Mr. Parkes, I understood you to say there were ten or twelve contractors who attended upon the deputation to him; you have mentioned the names of five only;—can you remember the names of the others? I have given you the names as far as I can remember them.

3389. *Mr. Parkes.*] Are you sure that it was after one of my speeches that you came to me in the House? I am not sure whether it was before your speeches or not.

3390. Do you not think it was before? I could not say. I know that a deputation waited upon you while I was away.

3391. You will remember that I asked for a second interview;—cannot you recollect whether that took place before or after I made my speeches? I forget. I think it was before.

3392. If you had had a chance of constructing the Monier arches, seeing that they are upon an absolutely different plan from that of the original design, it is quite possible that you might have beaten Carter, Gummow, & Co. in your tendering? If we went in for the thing properly, we might have done it as cheaply as they could do it.

3393. You say Mr. Carter told you distinctly that Mr. Hickson, sen., had asked that his son might be taken into the firm? Yes.

3394. The agreement which has been quoted to you to-day was the agreement proper of the partnership? Yes.

3395. And there can be no doubt but that it was to control all contracts then in hand? It was supposed to do so, as far as I knew.

3396. Was one of the contracts the Annandale job? No; that was let afterwards.

3397. Was not this agreement drawn up when you left the firm? No; when I joined Carter, Gummow, & Co.

3398. The agreement to which I have been referring was the one drawn up on 1st April, a notification of which appears in the *Sydney Morning Herald*? I have been referring to the agreement drawn up at the time Messrs. Gummow and Gillan joined Carter & Co.

3399. Do you consider that you yourself and other contractors have a difficulty in getting work in the Works Office from the way in which concessions are given to Messrs. Carter, Gummow, & Co.;—what is your opinion about that? I could not say.

3400. *Mr. Gummow.*] As to the conversation which you had with Mr. Carter down near the Bank of New Zealand—the last one, I mean—was it before Mr. Parkes' speech in the House or afterwards? It was after it.

George Maddison sworn and examined:—

3401. *Mr. Parkes.*] What is your occupation? You might call me an unemployed contractor just now.

3402. Did you at one time belong to the firm of Messrs. Carter, Gummow, & Co.? Yes.

3403. But you no longer belong to it? No.

3404. You know Mr. Ewing? Yes.

3405. Did you in the company of Mr. Ewing have a conversation at one time with Mr. Carter near the Bank of New Zealand in Sydney? Yes.

3406. Will you tell His Honor what it was? It amounted to this—that Mr. Hickson, jun., had been retrenched out of the Department, and that Mr. Hickson, sen., wished to find him employment of some sort, and had asked Mr. Carter if he could find anything for him to do, or whether they would take him in as a member of the firm. The reply which I understood Mr. Carter made to that request was that Mr. Hickson, jun., could not be taken into the firm within five or six years.

3407. *His Honor.*] That I understand was the account Mr. Carter gave you of what had happened? Yes.

3408. *Mr. Parkes.*] Upon what date after that did you leave the firm? It was some considerable time after that. I could not give you the precise date at which the conversation took place, but I think I gave notice of leaving at the latter end of October, or at the beginning of November, 1894.

3409. How long before that was it that the conversation took place? I suppose it must have been eight or ten months. It might have been more, but I could not say to a month or two.

3410. Did you take any exception to the action of Mr. Carter? Not the slightest.

3411. You were quite agreeable to what he did? Yes.

3412. Did you think the services of Mr. Hickson, jun., would be of benefit to the firm or otherwise? I did not know what his abilities were. I supposed that he would be of some use, or he would not have been taken on.

3413. That is what you thought of the matter? Yes.

3414. And you agreed to what was done? Yes.

3415. Later on Mr. Gillan, one of the members of the partnership, came up to Sydney from Adelaide, did he not? Yes; some considerable time afterwards.

3416. And you, in company with Mr. Ewing, had a conversation with him? Yes; we were talking about things in general.

3417. What did he say? He said he had seen a wire which had come from Sydney to this effect—that Mr. Hickson, sen., wanted his son taken into the firm.

3418. Did that part of the conversation go any further? No.

3419. There was not a general discussion about it? No; nothing more was said, to the best of my recollection.

3420. What brought up that conversation? I could not say now. I paid very little attention to what was said. I do not even know whether he went into the firm afterwards or not.

3421. When you heard the first conversation to which reference has been made, did you think, concerning Mr. Hickson, jun., that the firm were bound to take him in? I did not think they were bound to take him in.

P. Ewing.

17 June, 1896.

G. Maddison.

17 June, 1896.

- G. Maddison. 3422. If you had remained a member of the firm, would you have looked upon it as certain that the firm would have had to take in Mr. Hickson, jun., as a partner? I really could not say. It is a thing to which I have not given any particular thought.
- 17 June, 1896. 3423. But you consider that it would be an advantage to have him a member of the firm? It was an advantage to some extent, of course, or he would not have been employed, I suppose.
3424. You tendered in company with Mr. Ewing for Contract No. 77, did you not? Yes.
3425. Have you before seen the plan upon the board in front of you—I mean the substituted plan upon the Monier system for Contract No. 77? No; it was not on the table when tenders were called for that particular work.
3426. You noted particularly the departmental plan upon which tenders were called for? We got a man to take the quantities off it for us. We trusted solely to him.
3427. But you saw the plan? Yes.
3428. Is it not a most elaborately furnished plan;—have you ever had, in connection with former sewers, to tender for dressed stone cornice work? No; there has been none of that class of work in anything with which I have been connected.
3429. Has there been any pointed double-pressed brick work? The sewers are all constructed with double-pressed brick, I think.
3430. But as regards the facing? That I could not say.
3431. You know the nature of an elliptic arch? Yes; to a certain extent.
3432. Is it not a most difficult arch to build? I could not say. It is more expensive, no doubt, compared with other arches.
3433. *His Honor.*] Where does the difference come in? In almost everything connected with it. Once the centering is set, however, the other work is about the same.
3434. *Mr. Parkes.*] Is it not very costly to make elliptical arches? I am a little bit fogged on that point.
3435. Did not the original design of Contract 77 strike you as being a very expensive one? It looked fairly expensive, no doubt.
3436. When tenders were called for it, did it not strike you as being peculiar that the designs should be so expensive? I did not give much thought to it at the time. We tendered upon the plan as it stood. We did not know any alteration was to be made in it.
3437. Or you would have saved yourselves the trouble of putting in your tender? Yes; we should have saved the expense of getting the tender made out. We should have saved, I suppose, £10 or £12.
3438. Were you upon the first deputation of contractors which waited upon me? I was upon one of the deputations, but I do not know whether I was upon the first or the last.
3439. There were two deputations, were there not? I could not say.
3440. Do you know whether they were before or after my speeches in the House? I think they were before your speeches in the House.
3441. On both occasions? Yes.
3442. Were you upon the first or upon the second deputation? I think that when we waited upon you, you said you had a good deal of information about the matter.
3443. Did you come with Mr. Ewing? No.
3444. Was he present when you were there? No.
3445. Did you come to me voluntarily? Yes, certainly.
3446. When you were with me, what did I say to you—did I instantly jump at your proposal? No; you did not seem very hasty in acting upon it.
3447. I insisted upon you gentlemen making sure of your facts, did I not? Yes.
3448. Upon what was said to me at that deputation, I mean—concerning Carter, Gummow, & Co.? Yes.
3449. Can you recollect the conversation? Yes; I think so.
3450. What was it? It was principally about the Monier contract. The grievance of the contractors was that they had not had a fair go at the tender-box.
3451. Were any other contracts taken into consideration? I think the extension of a contract at North Shore was mentioned.
3452. Any other? I believe there was something mentioned about the cutting of a storm-water drain at Johnstone's Creek.
3453. Was I not asked to put an end to the concessions which were being made to this firm of contractors? That is what the deputation was about. We wished to put everyone upon the same footing.
3454. Did you represent other contractors besides yourselves;—what did you tell me with regard to that? There had been no particular arrangement. Everyone was dissatisfied, and there had been a good deal of grumbling. There might have been half a dozen other contractors there.
3455. Can you tell me whether Mr. Gillan and Mr. Forrest executed contracts in connection with Messrs. Carter & Co. in this Colony before April, 1895? You mean, were they partners in the same firm?—Yes.
3456. They did work in this Colony with the same firm? No; Mr. Gillan did not in this Colony.
3457. Has Mr. Gillan property in this Colony? Yes.
3458. Can you tell me where it is situated? Yes; he has a place at Dulwich Hill.
3459. What would be about the cost of it? I could not say.
3460. Have you seen the place? Yes.
3461. What sort of a house is it? It is a double-frontage cottage with a large piece of ground.
3462. Is it worth £5,000? No.
3463. Would it be worth £1,500? I suppose it would be worth that or thereabouts when he bought it.
3464. Speaking as a business man, what would you consider the actual value of the property now? Property has gone down so much in value that I could not say.
3465. Is this the only property Mr. Gillan has in the Colony of which you are aware? It is all that I know of.
3466. Has Mr. Forrest property in the Colony? I could not say. I have heard him say that he had property in New Zealand.
3467. But you do not know if he has property in this Colony? No.
3468. Do you know whether he has freehold property at Marrickville to the extent of £5,700? I could not say.

3469. Why did you wish to leave the firm of Carter, Gummow, & Co.? Because I was getting dissatisfied. G. Maddison.
3470. On what grounds were you dissatisfied? That is a very broad question.
3471. Had you any particular grounds for dissatisfaction? Well, I suppose I had, or I should not have left the firm. Of course, if they had ordered me out I should have gone out. 17 June, 1896.
3472. You did not, when you were leaving, make any statement to Mr. Carter about the position of the firm? Just concerning my own settlement, that is all.
3473. *Mr. Smith.*] I think you said you were an unemployed contractor? Yes; as far as contracts are concerned.
3474. You are not a land valuer? No.
3475. You have not done anything in that way? No.
3476. You have not much knowledge of Mr. Gillan's private affairs and of his property? No.
3477. He is more likely than you are to be able to give a fair estimate of the value of his own property? Yes.
3478. Regarding the first conversation that you had with Mr. Carter near the Bank of New Zealand—was Mr. Ewing there at the time? Yes.
3479. On the second occasion the conversation took place when Mr. Gillan had come up from Adelaide? Yes.
3480. I think you said it was Mr. Gillan who mentioned that he had seen a wire to a certain effect? Yes.
3481. What was the effect of it? It was from Sydney.
3482. From whom was it said to have come? From Mr. Carter.
3483. To whom was it said to have been sent? He did not say to whom it was sent.
3484. Did he say that it was sent to any member of the firm? No; he did not mention that; he simply said that he had seen a wire which had been sent by Mr. Carter.
3485. The effect of the wire being what? Asking that Mr. Hickson, junr., might be taken into the firm.
3486. Did he say when the wire was sent? No; I could not give the date of it.
3487. Could you give us any idea of the time when that conversation took place? I think it was some time in May, 1895.
3488. Did he then say that the wire had been sent recently? No; he did not say when it was sent.
3489. And the wire, you say, was simply to the effect that Mr. Hickson, senr., wanted his son taken into the firm? Yes.
3490. It was not a wire giving directions that Mr. Hickson, junr., was to be taken into the firm? It was not quite that.
3491. It was not a direction that he was to be taken into the firm at any cost? I could not say. I remember that it was asked that he might be taken into the firm.
3492. As a matter of fact, however, Mr. Hickson, junr., was never taken into the firm? I could not say.
3493. You were a partner in the firm up to 1895? Yes; the final payment I received was in 1895. I gave notice of leaving in October-November, 1894. I took very little active part in the work after that.
3494. Up to 1895 Mr. Hickson, junr., was not a partner in the firm? I could not say whether he was or not. He was not a partner to my knowledge.
3495. Did you ever tell anyone that Mr. Hickson, junr., was a partner? No.
3496. Did you ever make a statement to the effect that Mr. Hickson, junr., was a partner in the firm? Certainly not.
3497. Never to anyone? Never.
3498. So that if that statement has been made upon your authority it is untrue? It must be. I never said that in any way.
3499. With reference to the telegram of which you have spoken did you ever see a copy of it? No.
3500. Did you ever undertake to obtain a copy of it? No.
3501. So that if anyone has said that you undertook to produce a copy of the telegram, it is not true? Yes; I could not produce a copy.
3502. With regard to this second deputation to Mr. Parkes, I think that you said that Mr. Ewing was not on the deputation at which you attended? No.
3503. Who else was there? Am I bound to answer that question.
3504. *His Honor.*] Certainly? Mr. Williams was with me.
3505. *Mr. Smith.*] Who were the other members of the deputation which then waited upon Mr. Parkes? I could not say. I was away when the rest came.
3506. Then you and Mr. Williams went in to see Mr. Parkes alone? Yes.
3507. And you were not present when the other contractors waited upon him? No.
3508. Did they wait upon him before or after you waited upon him? I could not say. Mr. Parkes said that he had received some information about the matter before.
3509. At all events, the others were not there at the time you were there? No.
3510. Who is Mr. Williams? A contractor.
3511. Is he a member of a firm, or is he a sole contractor? He is a sole contractor. At all events, in the case of the last work he did he had no partner.
3512. I think you said Mr. Parkes made sure of the facts when he received you, and that he did not seem hasty? Yes: I think he made sure of the facts.
3513. You were there you say in order to put an end to concessions which had been made to Messrs. Carter, Gummow, & Co.? To do what I could towards it.
3514. Concerning those concessions, what were the facts you made sure of;—were they referred to in any way? Which facts.
3515. The facts which I understand you to say Mr. Parkes made sure of before he listened to you? Well, there was the alteration in this particular plan at Annandale and the cutting of a stormwater drain at Johnstone's Creek. The specification said nothing about that at the time tenders were called.
3516. Were there any other grievances? Not that I know of.
3517. Those were all you knew about? Yes.
3518. You did not know of any other concessions which were alleged to have been made to these contractors? No.
3519. You were not working in Adelaide when Mr. Hickson, junr., was there? No.
3520. It was Mr. Gummow and Mr. Gillan who were down there? Yes.



- G. Maddison. 3521. When you went into this partnership it related to a large contract which had been taken up in Adelaide? Yes.
- 17 June, 1896. 3522. And Mr. Hickson, junr., was employed there? To the best of my belief.
3523. He remained there at work the whole of the time? Yes.
3524. He did not come to Sydney? Yes.
3525. When was that? I could not say.
3526. How often did he come? I think he was up for a holiday once, but I could not be sure about it.
3527. Did he come here upon the work of the firm at all? Not to my knowledge.
3528. He did not come here on business? No.
3529. He is an engineer, I believe? I think so.
3530. I believe he served his time here? I could not say.
3531. At all events he was doing engineering work for your firm in Adelaide? I think so.
3532. So far as you are aware he did not come here upon any business of the firm? Not to my knowledge.
3533. As far as you know it would be incorrect to say that Mr. Hickson had been going backwards and forwards between here and Adelaide? As far as I know it would.
3534. *Mr. Gummow.*] Could you tell me whether Mr. Hickson, junr., came up from Adelaide with Mr. Gillan at any time? I do not think he was here at the time Mr. Gillan was here. I never saw him.
3535. When Mr. Hickson, junr., was engaged by the firm, had we any contract in hand in Sydney? No; they were just about completed.
3536. How long after our employment of Mr. Hickson, junr., was it that we obtained a contract here? I could not say.
3537. Did we get the contract, when we did get it at all, through the tender-box? Yes; No. 69.
3538. Would it be twelve months after Mr. Hickson's employment by the firm? No.
3539. Would it be six months after? About eight or ten months.
3540. Did you make out the tenders for any of our contracts? No.
3541. Who made them out? You always made out the tenders.
3542. Since you left the firm you have tendered for other contracts? Once or twice.
3543. Have you obtained any contracts yet? No.
3544. Did you get second in the case of No. 77 Contract? No.
3545. If Messrs. Carter, Gummow, & Co. had not tendered a lump sum, or had not submitted their tender 28½ per cent. below the schedule rates you would have got the contract. What I mean is that it made no difference to you personally? No.
3546. It made no difference to your firm at all? I do not suppose it did.
3547. Did you ever tender with Mr. Williams? Yes.
3548. He is the man who called with you to see Mr. Parkes? Yes.
3549. You say you gave notice to the firm at the end of 1894 that you wanted to go out? Yes.
3550. You did very little active work you say after that? Yes.
3551. Were you being paid by the firm during the whole of the interval between your notice and your leaving? Yes; I was paid up to the latter end of April.
3552. *Mr. Parkes.*] When you first called upon me, I said I wanted to make sure of your statements, was not that what happened? Yes.
3553. Have you, yourself, heard other contractors complaining about the concessions given to Messrs. Carter, Gummow, & Co.? Yes.
3554. Other contractors, I suppose, would be likely to make statements to me beside yourself? Yes.
3555. You have seen the substituted plan in Contract 77? Yes.
3556. It is a structure entirely different from the original design? No doubt.
3557. You had no design upon which to tender for the Monier work? No.
3558. You might have beaten Carter, Gummow, & Co. if you had had a design upon which to tender? We might have done. At all events, we should not have been labouring under the difficulties we had to meet.

George Forster Hickson sworn and examined:—

- G. F. Hickson. 3559. *Mr. Parkes.*] You are a civil engineer, I believe? Yes.
- 17 June, 1896. 3560. You are the son of Mr. Hickson, the present Under Secretary for Public Works in this Colony? Yes.
3561. Were you employed in the Department of Public Works in the year 1893? Yes.
3562. When did you leave the Department? I think in May, 1893.
3563. Do you not remember when you left the Department? I can tell you from looking at my diary. I see from my diary that I left in April, 1893.
3564. In what month did you join the employ of Messrs. Carter, Gummow, & Co.? In May.
3565. What salary were you receiving when you were in the Department? £200.
3566. And in the employ of Messrs. Carter, Gummow, & Co., what salary did you receive? £200.
3567. Were you not latterly receiving £250? Yes.
3568. How came you to enter the employ of Messrs. Carter, Gummow, & Co.? I was in want of employment.
3569. But did you do so at the request of your father? I did so at nobody's request.
3570. Did you apply for the appointment? Yes.
3571. Did you make any arrangement with Carter, Gummow, & Co. that ultimately you were to become a partner in the firm? No.
3572. Was there any conversation between yourself and Messrs. Carter, Gummow, & Co. as to your becoming a partner at any time? No conversation that I can call to mind.
3573. Did you look for a partnership at any time? That is a little indefinite, I think.
3574. Are you absolutely sure that you did not have a conversation with Messrs. Carter, Gummow, & Co. relative to your becoming a member of the firm? I never had any serious conversation with them about it.
3575. Did you have a conversation of any kind with them in reference to the matter? No.
3576. You never had a conversation of any kind with them as to your becoming a partner in the firm? Not seriously; but such a lot of things are said which one cannot remember. 3577.

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3577. You did not converse with any member of the firm about your being a member of it? No, never.  
 3578. You are positive of that? I am on my oath.  
 3579. When did you come up from the firm's work in Adelaide? At the end of July, 1895.  
 3580. Did Mr. Gillan then come up with you? No.  
 3581. Did he come up shortly afterwards? No.  
 3582. Before? I could not say. I do not know his movements.  
 3583. You know Mr. Gillan, I suppose? Yes.  
 3584. Does Mr. Gillan know your father? I could not say.  
 3585. Has your father ever had any conversation with Mr. Gillan? I do not know.  
 3586. What were your principal duties in the employ of Messrs. Carter, Gummow, & Co.? Chiefly alignment of the tunnels, levels, and occasionally quantities.  
 3587. On what date did you leave their employ? I received notice on the 1st April, 1896.  
 3588. When you left Sydney for Adelaide on the last occasion did you go with any member of the firm of Carter, Gummow, & Co.? No.  
 3589. You went by yourself? Yes.  
 3590. Who were the members of the firm in Adelaide at that time? Mr. Gillan and Mr. Gummow.  
 3591. Did your father know that you were going to those members of the firm? I think so.  
 3592. Why did you leave the employment of Messrs. Carter, Gummow, & Co. lately? They had no more work for me.  
 3593. They had not finished their contracts. They had plenty of work going on, had they not? What do you mean by plenty?  
 3594. They have started within the last two months another contract at North Shore? Yes; but there was nothing for me to do upon that.  
 3595. You actually left their employ later than the 1st of April, did you not? Yes; I had three months notice.  
 3596. Do you mean that you gave three months, notice? No; I took it.  
 3597. Had you any monetary interest in the firm apart from your salary? No.  
 3598. You had no interest in the Monier arch patent? No.  
 3599. You were paid every month, were you not? Yes.  
 3600. What was your monthly payment? I do not know at what stage of my engagement you refer to. I was not in receipt of the same salary during the whole of the time I was with them.  
 3601. I am talking of the later stages of your employment by them in 1896. What was your monthly salary then? I think it was £20 16s. 8d.  
 3602. Was April 27th the date you left the firm—do you remember? Do you mean the last day I was on the works?  
 3603. Yes? I can give you that from my diary. I see that I was last on the works on 30th April, 1896.  
 3604. Was not a cheque of £62 10s. paid to you on 27th April, 1896? I could not be certain about the date, but I think I received a cheque about that time.  
 3605. Of what payments was that cheque made up? It included the three months' notice.  
 3606. They let you go then and paid you for the three months? Yes.  
 3607. They paid you the cheque straight off on the 27th April for the three months? Yes.  
 3607½. Were they bound under an agreement to give you three months' notice? No.  
 3607½. Then why should they give it? Is it not usually done?  
 3608. *His Honor.*] What was your engagement—was it by the month? I got paid by the month.  
 3609. And nothing else was said? There was no agreement of any kind.  
 3610. It was an indefinite employment? Yes.  
 3611. But was it said that you were paid so much a year or so much a month? So much a year.  
 3612. You were paid monthly? Yes.  
 3613. *Mr. Parkes.*] There was no written agreement? No.  
 3614. There was no agreement that the firm were to give you three months' notice? No.  
 3615. There was no agreement for notice at all? No.  
 3616. You had nothing to do with account books or anything of that sort, had you? No.  
 3617. You had to do only with engineering work? Only with engineering work. Just measurements—that is all.  
 3618. Had Messrs. Carter, Gummow, & Co. an account? Not when I was with them.  
 3619. Had they anyone who kept books? What do you mean by books;—do you mean the bank book?  
 3620. I mean books of any sort? There were the usual office books for the payment of the men, pay-sheets, and so on.  
 3621. Had they an office book in which to record them? Latterly.  
 3622. Since when? I cannot give you the exact date, but it was three or four months before I left.  
 3623. They had no books before that? Not that I know of.  
 3624. What did the book in which they recorded these matters latterly consist of? It was simply the pay-sheets.  
 3625. They had no ledger? Not that I ever saw.  
 3626. While you were in the employ of Messrs. Carter, Gummow, & Co. were you living at your father's house? I went straight to Adelaide at the commencement, and after I came back I was living at home for about a fortnight, or perhaps a month.  
 3627. When you returned to Sydney permanently were you living at home? Not more than a fortnight or a month.  
 3628. Did you ever have any communication concerning contracts of the firm with your father? No.  
 3629. You were not delegated to see your father with reference to these contracts? I did not deal with him in business matters at all.  
 3630. In connection with your engineering duties you had not to come to the office? No.  
 3631. You did not come to check measurements and to ascertain if your measurements were correct side by side with those of the engineer of the Department? No.  
 3632. *Mr. Smith.*] Did you not come back from Adelaide before the end of July, 1895? No.  
 3633. From April, 1893, until July, 1895, you were in Adelaide working? Yes; for two years and three months I think.

- G. F. Hickson.  
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3634. Between the date when you entered the service of the firm in Adelaide in 1893 and the date of your return in July, 1895, did you come to Sydney at all? Yes, once.
3635. Was it on business? No, it was purely a private visit.
3636. You were on a holiday? Yes. I fancy it was at Christmas time. I see from my diary that I left Adelaide on 16th December, 1893.
3637. You were here for how long? I see that I was back on the works again on 19th January, 1894.
3638. During your visit to Sydney on that occasion had you anything to do with business relating to any of the contracts of Messrs. Carter, Gummow, & Co.? No.
3639. You had nothing whatever to do, then? No.
3640. That, you say, was the only occasion on which you were in Sydney between April, 1893, and July, 1895? Yes.
3641. When you came to Sydney in July, 1895, you were working here for the firm on some of their contracts? Yes.
3642. Who had charge of the sewerage work—who were the resident engineers upon the particular works upon which you were employed? Mr. Beveridge upon one and Mr. Millner upon another.
3643. Who was the supervising engineer? I think Mr. Davis was in charge of the storm-water contract, but I am not quite sure. I should not like to say for certain. The officers of the Department were all so mixed up at the time with the changes that were being made that I do not now remember.
3644. What were your duties upon the contract of the firm in Adelaide? I was working upon alignment and the levels of the tunnel.
3645. I suppose you had to work there pretty hard? Yes.
3646. You would not describe your post as a sinecure? Decidedly not.
3647. If anyone described your post as such it would be incorrect? I should say so.
3648. Sometimes you had to work all day on Sundays, did you not? Yes, frequently.
3649. Would this be a correct description of your duties—that you had nothing to do but to walk about and take photographs, and now and then use a theodolite on the works to no purpose;—would that be a correct description of your duties in Adelaide or in Sydney? It would be absolutely incorrect from the very start.
3650. I think you served your apprenticeship here? Yes.
3651. You said you were a civil engineer, I believe? Yes.
3652. Under whom did you serve? Under Mr. Moriarty, and after he left under Mr. Darley. My articles were made out to Mr. Moriarty.
3653. I believe Mr. Gillan was in Adelaide when you were there? Yes.
3654. You do not remember when he came up to Sydney, in 1895, before you came? No.
3655. It is absolutely incorrect to say that you came up with him in 1895, when you finally returned to Sydney? Yes.
3656. If anyone has stated that you came up here with Mr. Gillan some time in 1895, is that true? No.
3657. *His Honor.*] Were you not in the same boat, or in the same train with him? Never.
3658. *Mr. Smith.*] You did not come with him to Sydney in April or May, 1895? No; I never met Mr. Gillan in Sydney.
3659. You did not come to Sydney with him on any occasion? No.
3660. It is equally untrue, if it has been so stated, that while you have been employed by the firm in Adelaide you were going backwards and forwards between that place and Sydney for the firm? That would be equally untrue.
3661. *Mr. Gummow.*] At the time you were first engaged by the firm had they any contracts in Sydney that you know of? Not that I know of.
3662. And you were sent down to Adelaide to assist upon the work there? Yes.
3663. I want you to endeavour to remember whether there was any other partner in Adelaide at the time you arrived there besides Mr. Gillan and myself? Not to my knowledge.
3664. You do not remember any other partner being there? No.
3665. Do you remember going to the races the day after you arrived? Yes.
3666. Did you win any money? I did.
3667. Do you remember the drive we had after that, and a dinner? Yes.
3668. Who drove with you? Mr. Snodgrass and yourself.
3669. Was not Mr. Snodgrass a partner in the firm? I had been led to believe so.
3670. As far as you know he was? Yes.
3671. He would be in Adelaide, then, as well as Mr. Gillan and myself? Yes.
3672. Then in saying just now that you did not remember any other partner being there you made a mistake? Yes; I did not think of Mr. Snodgrass at the time.
3673. Do you know that he was or had been assisting on the work there? I believe he had.
3674. And he left soon after you arrived? Yes.
3675. When you came to Sydney at Christmas, 1893, did you come up on the firm's business at all? No.
3676. Did they pay your expenses? No.
3677. You paid your own expenses? Yes.
3678. You were on purely a holiday? Yes.
3679. Regarding your duties upon the contract in Adelaide, you said that you did the alignment and levels;—what alignment do you refer to? The centre line of the tunnel.
3680. Do you know how much tunnel work had been done? No. 2 had been done, and Nos. 3 and 4 had not.
3681. Would it have been possible for an engineer of the contractors to do all that work himself—would he be able to do the whole of that alignment by himself? No.
3682. He would require skilled assistance, you think? I should think so.
3683. You left Adelaide in July, 1895? Yes.
3684. Was the difficult alignment completed before you left—what I mean is, had the tunnel between the shafts been completed, permitting of their doing the rest of the alignment with ease? When I left lines had been dropped down all the shafts and the long base-line underground was completed.
3685. So that it was not necessary for you to stop when the really difficult work had been done? No.
3686. Therefore, you came up to Sydney? Yes.
3687. Had you duties to perform up here in connection with alignment and levels? Yes. 3688.

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3688. Had you any cross-sections to take? Yes.
3689. And measurements? Yes.
3690. Measurements of the work generally? Yes.
3691. Did you not assist with the pay-sheets? Yes.
3692. You know young Mr. Forrest? Yes.
3693. Did you not between you look through the accounts to assist us? Yes.
3694. You were doing your best for the interests of the firm, were you not? Yes.
3695. Do you consider that you earned the salary they paid you? Yes.
3696. When you were in Adelaide you were paid at the rate of £200 a year? Yes.
3697. What was the length of the contract upon which you were employed? Between 4 and 5 miles, I should say.
3698. Did the contractors find you a conveyance? No.
3699. Did you have to find one yourself at your own expense? Yes.
3700. You had to hire and keep it yourself? Yes.
3701. And you had to pay for that out of your salary? Yes.
3702. You had to pay for your board? Yes.
3703. When you were in the Government Service, and when you were on outdoor work, did you get any extra allowance for being on that outdoor work? Yes.
3704. Did you receive any from the contractors? No.
3705. With regard to the cheque of £62 10s. which you say you received at the end of April of this year, it was for three months' pay you say—you having received notice on 1st April? Yes.
3706. Did you keep in touch with the firm throughout April? Up to the end of April.
3707. Then you actually worked for one month out of the three? Yes.
3708. Really, then, you received pay for only two months during which you did not work? That is all.
3709. You say you had no agreement at all with the firm? No.
3710. Do you consider that the firm at any time dismissed their employes without giving them what they considered fair play;—did you ever know of our doing such a thing? I never heard of it.
3711. With regard to being a partner of the firm—were you ever in that position? No.
3712. Did I, or did any other member of the firm, tell you that you were a partner? No.
3713. Did you receive any bonus from the firm? No.
3714. Did you get your expenses from the firm when you went to Adelaide? Going down and coming back I got my expenses.
3715. What did they amount to? About £15.
3716. Besides that £15, or thereabouts, did you ever get anything from the firm in addition to your salary? Not a penny that I can think of.
3717. Is it not a fact that when you went in to Adelaide on the firm's business you paid your own expenses, and never charged them to the firm? Frequently.
3718. How far were the works from Adelaide? Eighteen miles.
3719. Do you consider that the firm paid you a huge price for your expenses? I received none at all for going in to the city from the works.
3720. Were you a loser or a gainer from the visits you made to the city on behalf of the firm? I was decidedly a loser.
3721. *Mr. Smith.*] I think you told Mr. Parkes that you stayed with your father for several weeks when you came from Adelaide in July, 1895? Yes.
3722. Where did you go after that? To Forest Lodge.
3723. To lodgings? Yes.
3724. You were staying with your father, then, only while you were looking for lodgings? Yes.
3725. I think you said that when you were in the Department you did not get anything above your pay? I received an allowance.
3726. What did it amount to? 2s. a day.
3727. *His Honor.*] What was that supposed to cover? It was a travelling allowance to cover train and tram fares.
3728. *Mr. Smith.*] I think you said your salary was £200 when you were in the Department? Yes.
3729. *His Honor.*] When was your salary from the firm raised to £250? I cannot quite remember; but I think at Christmas, 1893.
3730. You say you never had any conversation with any member of the firm as to a partnership? No.
3731. Was any hint ever dropped, or any suggestion ever made, that you should enter into a partnership? Well, I suppose such a thing may have been mentioned, but there was never any agreement or any definite arrangement of any kind made.
3732. What sorts of hints or suggestions were made? I often expressed a wish, I believe, to become a member of the firm.
3733. And what would be said by the persons to whom you expressed such a wish? They never gave me any hope at all.
3734. The question was mooted only in a general way? Only in a general way.
3735. At what time would that be? I could not give you any idea.
3736. Was it soon after you went to Adelaide, or was it before you entered the service of the firm? I could not say. It was never really discussed at all.
3737. What I understand you to say is that a hint was dropped by you that it would be a good thing for you if you were to become a partner—is that it? I do not know how to put it. I never asked them to take me into the firm, and they never asked me to join it.
3738. Then in what sort of way was the matter mooted? I cannot exactly say. Nothing was mentioned concerning it with any degree of finality. No hope was held out to me that I should become a partner.
3739. But did you say to any member of the firm that you would like to become a partner? No; I think I never said that.
3740. Did you suggest that as you were an expert it might be to the advantage of the partnership that you should become a partner? No.
3741. But some hint of the kind was dropped, I understand? I thought I should be bettering myself if I could become a partner, but nothing of a definite character in any shape or form was ever said.

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3742. What I want to arrive at is, what it was that was indefinitely said? I cannot remember.
3743. But whatever did occur occurred in South Australia? Yes. I saw Mr. Gummow privately just as often as I saw him officially, and we talked about various things—about other firms and matters of interest.
3744. And in the course of these conversations did you drop hints to him that you would like to be a partner of the firm? Yes; but in a purely private way.
3745. How did Mr. Gummow take these hints? He never gave me any encouragement at all.
3746. Was it a profitable concern—was the partnership making good profits out of the contracts they took up? I do not know.
3747. You assumed that it was? I had an idea that it was; but I did not really know anything about it.
3748. When you first went down to South Australia had contracts been cut very much, or were they going at fairly good rates? I do not know anything about that.
3749. It was there, I understand, that you did most of the work for the firm? Yes.
3750. And you say you know nothing about the rates of contracts then obtaining? No.
3751. You knew the schedule rates—the rates of payment—I suppose? No; I did not.
3752. You merely attended to the measurements, taking an interest in them and in nothing else? That is all.
3753. *Mr. Gummow.*] As a matter of fact, you lived upon the works? Yes.
3754. Where was I living? In North Adelaide.
3755. You often visited Adelaide, did you not? Yes.
3756. You often visited me at my private house? Yes.
3757. You often stayed there for the night, and we had frequent conversations upon all sorts of subjects? Yes.
3758. When you say that I held out no encouragement to you that you might one day become a partner, you say that which is absolutely correct? Yes.
3759. *His Honor.*] When you did leave the firm what was it that first led up to your leaving—was there anything more than a failure of work which led up to it? Not that I know of.
3760. Was any reason other than that given you when you received notice? No.
3761. Had there been any kind of dispute between yourself and the firm? No.
3762. It was simply that you were given notice that your services would be dispensed with? That is all.
3763. No explanation was given you? No.
3764. Did you not ask for any—did you not say, “This is rather a sudden affair”? It was not a sudden affair. I could see myself all the time that the work was drawing to a close.
3765. You had foreseen that you would have to go? Yes; it was very marked.
3766. *Mr. Gummow.*] Did we tell you verbally that your services would not be required after three months, or did we give you a letter? You told me verbally, I think.
3767. We gave you no letter? No.
3768. We had a conversation beforehand on the subject, had we not? Yes.
3769. And you could plainly see that the contract was practically ended? Yes.
3770. As to the new North Shore contract—do you remember speaking of it, and do you remember asking me if you were to go there? Yes.
3771. What did I tell you? I really forget what you told me.
3772. Did I say that we needed a contractors’ engineer on that contract? You said you did not, I think.
3773. Are there any members of the firm who are capable of doing their own engineering if they had the time in which to do it? Yes.
3774. If they were not too busy with other matters they could do it themselves? Yes.
3775. How many members of the firm are there who could use the instruments if they had the necessary time? Two, to my knowledge.
3776. Who are they? Yourself and Mr. Carter.
3777. *His Honor.*] Mr. Gummow, I understand, acquired more knowledge by practice during the time he would be carrying on these contracts than when he first went upon them? Yes. Of course, any man would gain experience from being upon them for a long time.
3778. *Mr. Parkes.*] Is not Mr. Carter a practical engineer? Not to my knowledge.
3779. Is he not capable of carrying out engineering works? Not to my knowledge.
3780. Is Mr. Gummow a practical engineer? Yes.
3781. He is capable of carrying out engineering works? Yes.
3782. Did you not know that Mr. Carter was a surveyor? Yes.
3783. Therefore, he would be capable of setting out work, would he not? I do not know. I never saw him set out work, and I never heard of his setting out work.
3784. Is Mr. Gummow an engineer by profession? Yes.
3785. *Mr. Smith.*] You are now employed by the Government of Western Australia? I think I am.
3786. *His Honor.*] You were when you left? I had applied for an appointment, but I do not know that my papers had gone through.
3787. But were you not in the service of the Western Australian Government? Temporarily until my papers went through.
3788. You were on the temporary staff? Yes.
3789. *Mr. Parkes.*] What pay were you getting in Western Australia as a temporary hand? 12s. a day. I was classed as foreman.
3790. Have you had any pay? I have not received any yet. I had to come away so quickly that I had not time to get it.
3791. Is there anything promised to you beyond what you are now getting? Yes; I had an appointment in view. I was only taking this 12s. a day while I was waiting for something to do.
3792. Then there is an appointment ahead of you under the Western Australian Government? Yes.
3793. Is it a certain one? The head of the office said to me, “Your papers will be through by the time you get back”; so I suppose it may be regarded as pretty certain.
3794. *Mr. Smith.*] What would be the pay attached to that appointment? I do not know.

FRIDAY, 19 JUNE, 1896.

John Carter sworn and examined:—

J. Carter.  
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3795. *Mr. Parkes.*] You are a contractor? Yes.
- 3795½. And the leading member of the firm of Messrs. Carter, Gummow, & Co.? No, not the leading member. We are all equal.
3796. But the firm is under your name? Yes; but we are all equally interested.
3797. Beyond the two small bank-books which have been produced, have you no other books upon which you conduct your business? No; we never keep any books. I have some more pass-books in connection with the account of Carter & Co. for which you asked the other morning.
3798. Do you not keep any ledger? No.
3799. Have you the butts of your cheque-books showing your transactions? Not for years back, but I have a few at home.
3800. For how long back would they go—would it be twelve months? I do not think so.
3801. Would you be likely to have the butts for six months? Probably.
3802. What has become of the others? They have gone into the fire or into the blacksmith's forge.
3803. You have the bank-books only, showing your transactions? Yes.
3804. Since 1894 have you had any other bank-books than those of Carter, Gummow, & Co.? Yes; Carter & Co.'s books.
3805. Is the account of Carter & Co. in operation at the present moment? Yes, it is. We are not doing any works under it, but we are receiving rents and are paying trifling accounts under it.
3806. Can you produce those books? Yes; I have them.
3807. I see that the books already produced deal with £70,000 received from the Treasury, and that Carter & Co.'s books which you say are in existence would deal with about £71,000, so that the transactions were divided between the two accounts? I do not exactly follow that.
3808. Certain contracts were paid to the account of Carter & Co., and others were paid to the account of Carter, Gummow, & Co.? That is correct.
3809. Will you now produce the books of Carter & Co.? Yes.
3810. Do the pass-books of Carter, Gummow, & Co. contain all the expenses of carrying on their business? Yes.
3811. And the books of Carter & Co. contain, I suppose, the distribution of the profits? No; they contain the workings of Carter & Co.'s old contracts.
3812. The payments of amounts in respect of those contracts? Yes.
3813. I see from Carter, Gummow, & Co.'s bank-books that various items have been paid as profit to certain partners;—they were retiring partners, I presume? Yes.
3814. I do not see any entry of profits paid to existing partners? No.
3815. Is there any entry of the payment of such profits in Carter & Co.'s books? No.
3816. I presume, then, that there were no profits upon the contracts? Yes, they are still in the bank.
3817. They are not yet divided up? We have not taken any.
3818. But you have taken salaries? Salaries only.
3819. During the last four years have there been no profits given to any of the existing partners? No.
3820. Only salaries? Only salaries. There have been temporary advances sometimes.
3821. *His Honor.*] Do you mean temporary advances against salary? Well, if I wanted £100 for a special purpose, I should draw it and have it charged against me.
3822. *Mr. Parkes.*] Mr. Baltzer, who was one of the holders of the patent for the Monier arch, received certain payments from Carter, Gummow, & Co.? Yes.
3823. I see he drew early in August 10 guineas; on 17th August, 20 guineas; in September, 15 guineas; in December, 10 guineas; early in January, 1896, 12 guineas; on 25th January, £60; on 22nd February, £20; 29th February, £32; 13th March, £73; and finally on 13th March, £508;—was Mr. Baltzer employed by you from August of last year? No; he was employed by us two or three months after he left the Government service. We employed him temporarily.
3824. What was the salary you paid him? £5 a week while he was working.
3825. Was the item of £60, which he received on 25th January, 1896, for the payment of wages also? It would be a general settlement of affairs between us. These amounts, besides wages, might include little temporary loans, and so forth.
3826. I presume there would be some profit arising from his interest in the Monier patent? Not the slightest; no profit has yet accrued upon that. It has been all loss.
3827. Have you received any percentage at all from the Government for the use of the Monier arch? Not up to the present time.
3828. I see that upon 13th March of the present year there was a payment of £508 to Mr. Baltzer? Yes.
3829. He has gone to Europe? Yes.
3830. He has gone to procure the Monier patent, has he not? He has gone to procure additional patents.
3831. But I mean the Monier? Yes; and any other system he can get hold of. He has gone to the Berlin Engineering Exhibition, and he is also visiting some dewatering works. He is investigating all these things with the view of getting up a scheme for the city abattoirs.
3832. Has he not gone to make more complete the Monier patent? There are new discoveries every day.
3833. As a matter of fact, are you not very uncertain about your rights in regard to the Monier patent? Not in the least.
3834. You have patented only the iron according to the drawings you have submitted? We have patented the construction of cement and iron, as far as I understand it.
3835. According to the drawings? According to the drawings and specification. [*Vide Appendix No. 18.*]
3836. If anyone chose to alter the shape of the iron as represented in your drawings, you could not prevent them from using it in compo.? I think so, certainly. I should endeavour to do so.
3837. Why did you not press your claim against Mr. M'Sweeney for the use of the iron? He has not used it yet.
3838. He has used iron in connection with concrete? Not yet.
3839. Not in his carrier? He has not built the carrier.

3840.

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3840. But he is proposing to use it? As regards that, we must wait till the thing is built. We cannot claim in respect of anything which is not in existence, but we took the precaution of writing to him telling him that we intended to make the claim.
3841. Did you tell Mr. Baltzer anything in connection with the right to get this patent? No.
3842. You paid all the expenses of obtaining it? Yes.
3843. How long after you obtained the patent was it before you offered it for sale to the Government at £1,500? I could not tell you the date. [*Vide Appendix No. 7.*]
3844. Would it be about a month? More than that, I think.
3845. It was offered on 3rd April, 1893, was it not? I presume so.
3846. Do you not know of your own knowledge as a contractor that iron has at all times been used in connection with composition or concrete? I know it has been used as tie-bars to connect structures, and for that sort of thing, but I never saw it being used in the form in which we are now using it.
3847. You cannot hold a patent for ordinary construction;—there must be some special reason? There must be some special reason.
3848. If anyone used a shape of iron different from that definitely prescribed by your patent you would have no action against them? I should certainly try the matter.
3849. As a matter of fact, were you not so dubious about your patent that, to put an end to your doubts, you sent Mr. Baltzer to Europe to perfect it? Certainly not.
3850. Then why did you send him only in April of this year instead of at an earlier date? Simply because it was only convenient at that time. There was no special reason for it. I have already explained that he had half a dozen errands.
3851. How did you make up the exact sum of £15,500 when you tendered upon the Monier system;—did you go into the quantities of the work? I could not tell you. That is not my work at all.
3852. Who made up the tender? Mr. Gummow and Mr. Snodgrass. Mr. Gummow principally. I might say, to put an end to that question, that I never made up a tender in my life.
3853. *Mr. Hickson.*] Did you ever make any payments to Mr. Baltzer when he was in the Government service? No.
3854. The first payment to him I understood from Mr. Parkes' questions was in August, 1895? Yes.
3855. Do you happen to know when Mr. Baltzer left the Government service? No.
3856. He was not in the service at that time, was he? I could not tell you. I might have lent him £10 then. I know that I did so on one occasion, and he paid me back either the next day or the next week. I cannot remember when he left the Government service. I did not take much interest in the matter.
3857. I think it was you who engaged my son on behalf of the firm? I did.
3858. Did I ever directly or indirectly ask you to employ him before you had so employed him? No.
3859. Never directly or indirectly? No.
3860. You engaged him on an application from himself? Yes, at North Shore.
3861. Without any interference on my part? Yes.
3862. You engaged him to go to South Australia, did you not? Yes, to Adelaide.
3863. He went there almost immediately afterwards? After a week or two, I believe.
3864. When did he come back to Sydney? Last year.
3865. It has been said in evidence that he came back in July, 1895;—up to that time had he had any connection directly or indirectly with any of your firm's contracts in New South Wales? No.
3866. Did he ever come up from Adelaide in connection with them, either with Mr. Gillan or on his own account? No.
3867. With reference to the telegram which has been mentioned, did you send a telegram to either Mr. Gummow or Mr. Gillan in Adelaide in which you made a statement to the effect that it was necessary to take my son into the firm? I did not.
3868. Do you know of anything that would give rise to such a report? I do not.
3869. *Mr. Gummow.*] I would like you to be a little more explicit with regard to the business of Carter, Gummow, & Co., and Carter & Co. I think you said that the whole of the payments which were made in connection with the transactions of Carter, Gummow, & Co. were made from their account? Yes.
3870. Under whose name was Contract No. 79A carried out? Under the name of Carter & Co.
3871. Were the payments to Carter & Co. made into the account of Carter, Gummow, & Co., or into the account of Carter & Co.? Into Carter & Co.'s account.
3872. Were the expenses connected with the contract paid out of Carter & Co.'s account, or out of Carter, Gummow, & Co.'s account? Out of Carter, Gummow's account.
3873. In what way did you arrange between Carter & Co. and Carter, Gummow, & Co.? The amounts were transferred, and the two accounts were balanced. The indebtedness of Carter & Co. to Carter, Gummow, & Co. being arrived at from the Bank-books.
3874. Contract 79A was carried out under the name of Carter & Co., and the payments made into that account were afterwards transferred to the account of Carter, Gummow, & Co.? That is correct.
3875. In the meantime Carter, Gummow, & Co. paid the expenses in connection with the contract? Yes.
3876. Did Carter & Co. pay any of the expenses in connection with it? No.
3877. As to Mr. Hickson, junior, did you ever give or make to him any payment in any way other than his salary or his expenses to Adelaide? No.
3878. You never gave him anything in the shape of a bonus, commission, or profit out of the concern? No.
3879. Do you know whether any other member of the firm ever did so? I am not aware of its being done. I presume you would not call a two-months' salary, paid to him in connection with his three-months' notice, a bonus.
3880. If regard to his engagement, did he come to you or did you go to him? He came to me.
3881. Did you go to his father first? No.
3882. You engaged him upon his own application, and without his father's sanction? Yes.
3883. You engaged him entirely upon his own application? I did.
3884. And you sent him down to Adelaide? Yes.
3885. Why did you send him down there;—did you ask me whether I wanted him or not? I engaged him upon my own responsibility, knowing that you required someone.
3886. When you engaged him, did you send me word? I engaged him first and told you afterwards that I had done so.
3887. In writing to me you told me that you had engaged him for me? Yes.
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3888. What did I reply to you? I do not remember the words, but I recollect that the meaning of the reply was, "Send him along."
3889. Did you consider his presence necessary in Adelaide to help to do the work? Yes.
3890. Had I any assistance before Mr. Hickson, junr., came to Adelaide? Yes; Mr. Snodgrass was there. I also was there a little while.
3891. Is it not a fact that Mr. Snodgrass was there assisting me at the time Mr. Hickson, junr., came? Yes.
3892. Did Mr. Snodgrass return to Sydney shortly afterwards? Yes.
3893. Was he needed upon any contract here? Certainly—upon No. 79.
3894. From your knowledge of what Mr. Hickson, junr., had been doing, you knew that he was an engineer, and that he could use the instruments? Yes; I knew the contract upon which he had been employed.
3895. *His Honor.*] Which was that? Carson and M'Sweeney's outfall works. He was the Government Assistant Engineer.
3896. *Mr. Gummow.*] Could Mr. Snodgrass use the instruments? Yes.
3897. Was Mr. Snodgrass my superior officer in Adelaide, or was he my assistant, or what was he? I should say, under the circumstances, that he was an assistant.
3898. He was an equal partner with myself, but he was an assistant to me at that time—that is to say, I had charge of the work? Yes.
3899. And actually he assisted me in any alignment or levels I required;—I presume you understand that? Yes; I was there some part of the time.
3900. You saw the work in which he was assisting me? Yes.
3901. And did you consider that Mr. Hickson, junr., could assist me in a similar way? Certainly, or I should not have sent him.
3902. Do you know Mr. Snodgrass's salary;—was it larger than that which Mr. Hickson, junr., received? He received his usual salary, £10 a week.
3903. Would it have been wiser for the firm to keep Mr. Snodgrass there than to get someone at a cheaper salary to assist? As far as I understood, it was not a matter of keeping Mr. Snodgrass there at any salary. He had to come back in connection with other matters.
3904. It was to the benefit of the firm to send someone down there at a smaller salary to assist me? Yes.
3905. You considered it for the benefit of the contract that I should have someone to assist me? Yes.
3906. Do you know in what year Mr. Hickson, junr., was sent down to Adelaide? In 1893, I think.
3907. Do you know whether I had any other duties to perform besides the carrying out of engineering upon the Adelaide contract? Yes.
3908. Where were they? In Melbourne.
3909. I had often to go there in connection with the firm's business? Yes.
3910. What was the business? Tendering for contracts. We were tendering for twelve months.
3911. Were they large contracts? Very large.
3912. Did the doing of that work take up a great deal of my time? Yes.
3913. Did you consider that the contract in Adelaide could have been left without engineering skill in the meantime? It could not.
3914. As to the matter of Mr. Hickson, junr., becoming a partner;—did you ever suggest that he was to become a partner? No.
3915. Did you ever hold out any encouragement to him to believe that he might one day become a partner? Not the slightest.
3916. Did you not, on the other hand, damp him, as it were,—instead of encouraging him did you not rather discourage him? Certainly I did. As far as I can remember the matter only cropped up once between us conversationally, and then I sat upon him, as it were.
3917. *His Honor.*] When and where was that? During his trip here. When he was on his holidays I believe. He was always anxious to better himself, I presume. We had seven partners in the business, and I thought that quite enough.
3918. *Mr. Gummow.*] Actually he was never a partner in the firm? Never.
3919. *Mr. Parkes.*] Did you ever have any communication in any way, verbally or written, with Mr. Hickson, senr., concerning the appointment of his son? No.
3920. Had you not any at the time of his appointment? No.
3921. You say that Mr. Hickson had been employed upon Carson and M'Sweeney's contracts? Yes.
3922. He was under the Government? Yes.
3923. Did he come direct from that contract to you? Yes.
3924. Had he any employment with which he might have gone on at M'Sweeney's? Certainly not.
3925. The work was going on was it not? Yes; but he was retrenched.
3926. But if there was need for an engineer upon that work why should he be retrenched? That is a departmental matter. I might guess at it but I could not definitely say the reason.
3927. You wrote to your partner in Adelaide you say, stating that you had engaged Mr. Hickson, junr.? Yes, I wrote to Mr. Gummow.
3928. Have you a copy of that letter? No.
3929. Could you produce the letter? No.
3930. Can you tell us exactly what you said in the letter? No; I could not tell you the exact wording of it. I have already told you the meaning of it. I simply informed him that I had engaged Mr. Hickson junr., as an assistant engineer, and I presume, he had no objection, or something to that effect.
3931. Would you make an effort to obtain that letter? I know it is utterly impossible to obtain it. It is of no use saying I could do so.
3932. *His Honor.*] Do you not keep copies of letters of that kind? Mr. Gummow, I should have explained, was in sole charge in Adelaide, and looked after the interests of the firm there. I looked after the commercial interests of the firm here. I was in the habit of writing to Mr. Gummow what might be termed friendly letters, informing him, among other things, how the business was going on in Sydney. They were chatty letters, so to speak. In one of these letters I remember telling Mr. Gummow, among other items of news, that I had sent down Mr. Hickson, junr. So far as Mr. Gummow's letters to me are concerned, they were absolutely of no importance, and, as a rule, I tore them up in the street directly I had read them.

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3933. Before you put on Mr. Hickson, junr., had you not an engineer named Chiene in your employ? Yes.
3934. You removed him to make room for Mr. Hickson, junr.? No. Mr. Chiene had gone out of our employ long before that.
3935. Is it not a fact that he left your employ a month only before your engagement of Mr. Hickson, junr.? No.
3936. You are sure of that? Yes; certain of it.
3937. He did not leave just as Mr. Hickson entered your employment? No. Your question took me rather by surprise, because I had an impression that Mr. Chiene left our employ years ago. He was engaged for a fixed time, and at the expiration of that time he left.
3938. It was July, 1893, when Mr. Hickson, junr., left Adelaide? I think so. It was about this time last year.
3939. Did he not then go upon one of your works in Sydney as an engineer? Yes; he was brought back for that purpose.
3940. To take charge of a work here? No.
3941. But to act as an engineer upon it? Yes.
3942. What did you pay Mr. Chiene? £300 a year.
3943. *His Honor.*] How was it that the firm first came across the Monier patent, and formed the idea of patenting it out here? It was through Mr. Baltzer. He was an engineer himself, and he was always looking into engineering subjects. He was a friend of ours—a personal friend, I might say.
3944. And he mentioned it to you? Yes.
3945. As a good thing? Yes. I might tell your Honor that up till now we have spent £2,000 in tests, patenting, and so forth.
3946. Would that include the tests that were made at Johnstone-street aqueduct? Yes; the figure I have given you is what it has roughly cost us. It has been an expensive experiment.
3947. You said that so far there had been no profit upon it? Absolutely none.
3948. No profit from the use of the Monier patent? None.
3949. As far as the work has gone on on these two aqueducts, can you see at present whether you are making a profit or whether you are making a loss, or how matters stand? We can see that we shall come out on the right side, but not to any great extent. As to separating the Monier from the other work at present, I have not gone sufficiently into the matter to be able to do that. We are waiting until the contract is finished.
3950. You cannot say, then, as regards the Monier part of the work itself, how you will come out? No; but we shall not lose. We shall probably make a little.
3951. With reference to this telegram which has been referred to, do you remember whether you ever sent a telegram to Mr. Gummow in which Mr. Hickson's name was mentioned at all? I do not remember it.
3952. Are you sure you did not? Quite.
3953. At no time? No.
3954. You have spoken of the firms of Carter & Co. and Carter, Gummow, & Co.? Yes.
3955. During the year 1895 who were Carter & Co.? Carter & Co. were Messrs. Carter, Snodgrass, and Forrest. They were actually merged into Carter, Gummow, & Co.; but Carter & Co.'s contracts were not completed. Consequently, an account had to be kept open until final payments were made.
3956. The only reason for the continued existence of Carter & Co. as distinct from Carter, Gummow, & Co. was for the purpose of working out the old contracts which Carter & Co. had taken? Yes.
3957. Before Carter, Gummow, & Co. came into existence? Quite so. More especially with regard to Contract 79A at North Shore, which was practically an extension of Carter & Co.'s own contract.
3958. So that Contract 79A was actually Carter & Co.'s? Yes; but being partners in the other contracts we put it into Carter, Gummow, & Co.'s business. It had, however, to be carried out under the style of Carter & Co., and all payments were made into Carter & Co.'s account. That is the reason for the existence of Carter & Co.'s account at the bank.
3959. *Mr. Smith.*] As to Contract 79A, would the name of Mr. Gummow or Mr. Gillan be recognised in that contract by the Government? No, the only names would be mine and Mr. Snodgrass's.
3960. And Mr. Forrest's? No.
3961. *Mr. Gummow.*] You say you wrote me certain letters;—did you mean that you wrote them to me or to Carter, Gummow, & Co.? To you personally. I have already explained that.
3962. Your letters were not business letters to Messrs. Carter, Gummow, & Co.? No.
3963. They were private letters in which business subjects were often included? That is correct.
3964. Coming back to the employment of Mr. Hickson, jun., how did you happen to know that I would require him;—had you seen me much before that time? Yes; I was in Adelaide by your special request about a month before.
3965. Would it not be less than a month before? I am giving you an extreme date. Probably it would be within a fortnight.
3966. When you were there was there any conversation in reference to the general business of the firm, or were you there on a holiday? I was there on the firm's special business to look into the working of the contract.
3967. As to Mr. Gillan, did you write to him as you wrote to me? No.
3968. Did you send a telegram to him? No.
3969. Did you ever write to him once? Not to my recollection—in fact, I am sure I did not.
3970. And you never sent him a telegram? No.
3971. To whom would a telegram such as that referred to be sent if it were sent at all? It would be sent to you.
3972. As to Mr. Chiene, Carter & Co. had him in their employ for a time? Yes.
3973. What engagement had he? A two years' engagement.
3974. Do you remember his meeting with an accident? Yes.
3975. Was he laid up for any length of time? Yes; he was in St. Vincent's Hospital for a considerable time.
3976. Did you pay him a salary while he was laid up? Yes.
3977. Did you employ anyone in his place while he was laid up? Yes.

3978. Then you were paying him his salary while you were at the same time paying someone else to do his work? Yes.
3979. You did not deduct from his pay the salary of the man who was doing his work? No.
3980. How did Mr. Chiene get hurt—was it on the works? No; he was jumping out of the tram going to the races.
3981. Did he ever come back to the works? Yes.
3982. You occupied him to the full extent of your agreement? I did.
3983. Had you ever assisted him since? Yes; repeatedly.
3984. Was there any reason why you felt bound to assist him? No.
3985. Have you seen him within the last six months? Yes.
3986. Did he tell you that he was in a poverty-stricken condition? Yes.
3987. And what did he ask you to do for him? Well, I should prefer not to answer questions of this kind. He did not ask me to do anything, but he came down to the works with a subscription list for himself. I saw him in the yard and I said, "Hallo, Chiene, what are you doing here?" He said, "To tell you the truth, I am very hard up."
3988. Did you assist him? Yes.
3989. For any length of time? Yes. I paid his baker's bill for three or four months.
3990. Were you bound to do that? No.
3991. It was merely a transaction as between one man and another? Well, I was sorry to see an old servant in that state.
3992. *Mr. Parkes.*] What was the date of your entering into your partnership with Mr. Gummow? In August, 1892.
3993. And you engaged Mr. Hickson, junr., when? In April, 1893.

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George McCredie recalled and further examined:—

3994. *Mr. Parkes.*] You have made out comparative estimates in respect of Contracts 101, 112, and 77? G. McCredie. Yes.
3995. *His Honor.*] Do you mean 77 according to the departmental plan or according to the Monier plan? According to the departmental plan and the Monier plan also. 19 June, 1896.
3996. *Mr. Parkes.*] In regard to Contract 112—Mr. Sweeney's contract—will you tell His Honor what you make out to be the area of the carrier, and also the cost per foot of the aqueduct? The area of the carrier of No. 112—that is, the full section—is 41.22 superficial feet, and the cost per foot run is £5 6s. 7½d. [*Vide Appendix F.*]
3997. That is for the whole work? Yes.
3998. Taking the Monier design in No. 77 Contract, what do you make the figures? The per foot run, including the foundations, as in the other case, comes out at £3 2s. 3½d. The area of the carrier at White's Creek is 11.56 superficial feet, and at Johnstone's Creek 13.5 superficial feet.
3999. It is only about one-third of the capacity of the carrier in Contract 112? Yes; about one-third.
4000. Mr. Bage, in his report, says that Contract 101 (Mr. Ahearne's) works out for two sewers at about £10 16s. 1d.;—will you tell His Honor what you worked this contract out at, taking one sewer? The cost according to my figures is £4 15s. 4½d. per foot run for the carrier.
4001. What was the capacity of the one 6-foot barrel? 28.27 is the area.
4002. *His Honor.*] When you say area do you mean the full section or the carrying area? The area of the surface right round.
4003. You mean when it is absolutely full? Yes.
4004. *Mr. Parkes.*] The result of your investigation is that you find the departmental design for Contract No. 77 more costly than the other two? Yes. Taking the departmental design and considering the area, it is more costly.
4005. There can be no doubt about that? No doubt.
4006. You have been very careful with your checking? Yes. I have gone through these figures very carefully.
4007. Taking Contract 101 in the proportion of one carrier, what is the comparison between that and Contract No. 77? The comparison would be this—the 6-foot barrel drain in No. 101 is £4 15s. 4½d. per foot run with an area of 28.27 superficial feet, as against £5 1s. 3d. per foot run with a capacity, in the case of the White's Creek aqueduct, of 13 feet, and in the case of the Johnstone's Creek aqueduct of 14 feet, taking the departmental design in Contract No. 77, or (say) about one-half the capacity.
4008. *His Honor.*] By the Johnstone's Creek aqueduct, you mean the aqueduct nearer to Sydney? Yes.
4009. *Mr. Parkes.*] Why is it that the departmental design for Contract No. 77 is so much more expensive than the others;—what is the difference in the work? There is a most extravagant class of work in that design. For instance, there is the tuck-pointed brickwork, the stonework, and a heavy concrete. It is more expensive in every way. [*Vide Appendices A, F, and C.*]
4010. The concrete is very high-class? It is first-class concrete for the work. You could not put in better.
4011. As regards Contract 77, have you taken out a rough measurement of the cost per foot run of the tunnelling and the sewer work in the tunnelling? No. I have not taken it out yet.
4012. Will you prepare that for us? Yes.
4013. Will you tell me the exact cost per foot run of the tunnel work, upon which you are engaged for telephone wires? I have not the exact particulars with me, but I can get them. We have them all worked out.
4014. Cannot you say what the cost is from memory? It will be £2 odd per foot run.
4015. How many shillings? I could not say from memory.
4016. It would not be much over £2? I think it would be £2 3s. and something per foot run. [*Vide Appendix No. 15.*]
4017. It would be rather elaborate work, because it has to carry, with the wires, insulators and other things of that description, has it not? It is strong work. It is 9-inch brickwork built in cement on a solid concrete bottom.
4018. What is the size of the chamber? Five feet 9 in. high by 4 ft. 6 in. wide. [*Vide Appendix G.*]
4019. Besides your lining, have you not concreted solid all round it? We have not concreted solid round it outside, but it has been packed solid.

4020.

G. McCredie. 4020. With what? Ballast.

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4022. And you are perfectly sure of them? I am perfectly satisfied with them.

4023. Have you not allowed ample to pay for builder's risk, profit, and things of that sort? I reckon from my quantities and from the prices I base them on, that there is 10 per cent. profit on the whole concern.

4024. To cover everything? Yes.

4025. If you, as an engineer, had brought to you a patent and you were asked to get one of your clients to use it, on whom would you throw the risk of the patent? You mean if the thing were being introduced?

4026. Yes? I certainly would throw the risk upon the parties who introduced the patent. If there was any great risk I should be very dubious about having anything to do with it.

4027. Would you think of asking your client to pay for the risk? I do not think it would be a proper thing to ask him to pay for such a risk. When a person is introducing a new patent it is to his advantage to get an opportunity to introduce it.

4028. From your practical knowledge, what do you think will be the result of this Monier construction, seeing that it is composed entirely of compo and iron? That I could not say. I regard these aqueducts simply as an experiment. You must have experience in such matters; you must use it in a structure before you can judge as to whether it will stand properly.

4029. Do you think three years is sufficient maintenance in the case of such a risk, supposing the life of the sewer to be 60 years? That is a question. Three years does not seem a long time for which to guarantee a job of that sort, especially when the work is supposed to last for such a long time.

4030. Have you ever used iron in concrete and compo. work? Yes; both in compo. and concrete work.

4031. Have other architects and engineers done so? I suppose so.

4032. Would they do it now, do you suppose? Well, I would do it myself if I wanted to use the materials.

4033. You would use iron in cement or compo. at the present time without any fear in regard to any patent? Yes, if I wanted to use it I should use it in the same way as it was used in these Monier arches. I do not regard the so-called Monier patent as a patent at all. We have used ironwork in the construction of cement and concrete structures ten years ago. I have often used it in my own business.

4034. Since you gave your evidence the other day you have paid more attention, have you not, to the way in which this Monier aqueduct work is being constructed on Contract 77. You have seen the construction? Yes.

4035. How many centres are the firm using in the construction of this work? Upon this particular work they are apparently using only two centres.

4036. That is all you could see? Yes.

4037. How have they built the centres? They are built in two segments.

4038. They are not in one piece? No; they are made of Oregon timber about 4 inches thick. They are in three pieces shaped to the contour of the arch. They are built up one on each side where the arch is to be erected, and then a piece is fitted in the centre. It is a very simple construction, and I do not see anything special about it. It is ordinary soft-wood scantling.

4039. Is there any difference between these centres and ordinary centres? No; if there is any difference at all they are more simple in construction than an ordinary center.

4040. You observed closely the way in which the ironwork was being put in? Yes.

4041. Is it being put in all in one piece or in many pieces? It is put in in lengths which are fastened one close against the other with wire. They are about 4 inches apart.

4042. Do they put these pieces in as the work goes on? Apparently.

4043. They do not make in the first place a complete arch of iron-work? No; I do not see how they could possibly do the work in that way.

4044. *His Honor.*] Did you see a big arch being built? They were not putting stuff in when I was there, but from what I know of the class of work, and how the compo. was prepared for putting in, I could give you a fair explanation of it. The large arch was in readiness for the putting in of the stuff when I was there, and they were fitting up the principals of the others. The arch was being put up in just the same way as I described just now. There were the principals on each side, and the segment in the middle was fixed in, with a straight piece braced up from the sides. The top was boarded over with ordinary boarding, the same as would be used in ordinary arches for any work of a similar description. The sides are then boxed in. The concrete had apparently been mixed on the bank right at the side, and a plank was running right out to where the arch was to be built, so that the stuff could be barrowed right up to the place, put on the board, turned over, and placed in position. If I were building the arch, that is the way in which I should carry it out. I would have the compo. put in on the top of the boards. I should have my distance pieces put in at the distance required for the grill, and I should then work all my face over up to the level of the grill, and ram it well in. I should then fill in on the top in the same way as in the case of ordinary work.

4045. *Mr. Parkes.*] Is not that the way in which they are doing this work? It is the way in which it is being done as far as I can see. I was very particular about this point, on account of Mr. Hickson saying that there was such a difference between my price for the compo. and the Department's price. I wanted to find out whether I had made a mistake or not. Had I found that I was mistaken I should have said so at once. I could see nothing special at all in the mixing of the stuff or the putting of it in.

4046. *His Honor.*] Do I understand you to say this—that a layer is in the first instance laid upon the centering and that the grill is then laid upon that in sections? I do not know if they are doing the work in that way, but I think they would be because that is the only way in which it could be done properly. The stuff would have to be rammed before the grill was put on, because there are only 4 inches of space between the iron rods, and if the compo. were put through the grill there might then be some difficulty in connection with the ramming.

4047. Would it be possible to ram it in thin layers as you describe? Yes; it soon consolidates. In fact, it is not good unless it consolidates soon.

4048. Can you say whether the grill is, as a matter of fact, finally made in one piece or not before it is

is put on to the compo., or before the compo. is run through the interstices as the case may be? I G. McCredie.  
could not say whether they do it in the way I have described or not, but that is the way in which I should  
do it to make a good faithful job of it. 19 June, 1896.

4049. You did not actually see them putting the grill in? No.

4050. Supposing it had been proved that it is done in this way—that the grill, although it cannot be made in one single piece, is made up into one piece by shorter lengths being lapped over and fastened with wire—suppose that the grill is laid on before there is any compo. put in at all, and that it is separated from the boards by little pieces of wood nailed on to keep it a proper distance out, and that then the compo. is put in by hand work through the grill, small hand-rammers being used to consolidate it—you cannot say that it is not done in that way, can you? That would not be as satisfactory a job as getting it set before the grill is put in, because the grill would then get a permanent level, whereas by ramming it in and out between the squares you might get it up here and down there. By putting in a layer of the compo. first you get a good surface upon which to lay the grill.

4051. How long would it take to set? Not long. They generally keep it from setting too quickly by wetting it.

4052. Would it set firmly enough to carry the grill;—how long would it take it to do that? By the time you got the work all over and smoothed up, it would carry the grill. We prefer to keep it wet as long as we can.

4053. *Mr. Parkes.*] Have you gone into the question as to what would be the stability of the arch if the iron were left out? I have not taken out any calculation of the strains of this kind of arch.

4054. Would you like to risk it? On the appearance of it I would not like to risk it.

4055. It all depends upon the fitting in of the iron? Yes; the iron constitutes the safety of the system.

4056. If it happened that from putting the iron in in pieces, it settled at any place sufficiently to cause a crack, what would be the result? The question is, of course, whether the iron will give or not.

4057. Supposing it does give? That, of course, would be a source of weakness.

4058. And once the arch were cracked what would become of the structure? It would be a weak arch if it were cracked. There is no doubt about that.

4059. There would be a danger to the structure you think? Yes.

4060. Supposing you were a builder, and you had to put up these Monier arches, would you be thoroughly satisfied with the prices you had put down for them? Perfectly satisfied. I would undertake to carry them out for the prices I had put down, and I am sure I should then make a profit of about 10 per cent.

4061. If, as an engineer, two plans were put before you—one the substituted plan in Contract 77 and the other the original design—which would you prefer to take, supposing the prices of the former were £250 below the other? £250 would not be a sufficient inducement. If I wanted to carry out work in connection with an aqueduct to carry water, and I had not sufficient money wherewith to build on the Departmental plan, I would certainly adopt the other plan upon the score of economy. There is no doubt as to its being cheaper. The Monier system carried out in its entirety is effectual enough for the work, but only on the score of great economy would I accept it as against the other plan. I do not think the difference between the prices you mention would be sufficient inducement for the adoption of the Monier in preference to the original design made out by the Department.

4062. Ordinary bridge construction is in brickwork with stone arches and concrete, is it not? Yes.

4063. And if the Monier work is 50 per cent. cheaper in bridge work, is there any reason why it should not be 50 per cent. cheaper in aqueduct work? I see no reason why it should not be just the same. It ought to be cheaper. Of course there is the channel to be considered, but that would not make such a big difference.

4064. As a matter of fact, is not a channel cheaper than a carrier? There is not much difference between them.

4065. Not when one is encased in concrete, and when the other is only 4 inches thick? Of course, a good deal depends upon the construction.

4066. Still, if the Monier work is 50 per cent. cheaper in bridge work, you are satisfied that it would be 50 per cent. cheaper in aqueduct work? Yes.

4067. And do not the figures you have made out show a difference of 50 per cent. between the two designs? Yes; there is no doubt about that.

4068. Suppose you as an engineer made out a design and called for tenders upon it, would you permit an officer of yours to make drawings with your knowledge to compete against the original drawing and then advise that a tender be accepted for a lump sum upon the substituted drawing without going into quantities to ascertain its real cost? It would be a most unusual course to adopt. I should not adopt it myself, nor would I allow anyone to adopt it in my office.

4069. If a substituted drawing were put in by a builder before you recommended a plan to your client, would you not endeavour to ascertain its exact cost? Certainly.

4070. And would you not take the trouble to take out the quantities in order to ascertain it? Yes.

4071. How long would it take you to take out the quantities in the case of the Monier arches? About three days altogether, I should say.

4072. Would not the aqueduct design in the case of Contract 112 be equally serviceable if it were employed in the case of No. 77? I should think so.

4073. It would be just as effectual for the purpose? Yes.

4074. Would it not be better if the work in the Monier arches were carried out with bluestone concrete instead of compo.? That is my opinion, because it is better than compo.

4075. Concrete is at any time better than compo.? Yes.

4076. *His Honor.*] Do I understand you to mean that you could work the concrete in with an iron grill in the arch as effectively as you could work in compo.? Yes; with a small gauge metal with special stone. As a matter of fact, in the Monier system they are doing it. They are putting a special concrete down outside the grill in the channel, and that works down in between the iron?

4077. On the side of the channel? Yes; in the aqueduct I looked at the other day some parts were finished and other parts were going on.

4077A. But I should say the difference between the two classes of work would be this—that in the case of the compo. there would be more continuous and complete adhesion to the iron than in the case of the concrete; for instance, wherever a piece of stone came into contact with the iron there would be no  
adhesion.

- G. McCredie.  
19 June, 1896.
- adhesion so far as that small piece went? There would be very little difference. I noticed the special bluestone stuff; it lies very close in the channel; in fact, you can see it sticking hard up against the iron.
4078. Practically you think it would come to the same thing? Yes; but of course special concrete would be more expensive than the compo.
4079. Would it set into a stronger mass finally apart from the iron? Yes, I think so. It is more like a solid mass than the compo. The compo. is more brittle.
4080. *Mr. Parkes.*] In the construction of any portion of this aqueduct is fine bluestone concrete used? Yes.
4081. And does it adhere to the iron? Yes; it goes against the side of the grill in the channel.
4082. *His Honor.*] You mean the vertical grill? Yes.
4083. *Mr. Parkes.*] When you were out at the works the other day I believe that the ends of the iron work which you formerly described as being rusty were cemented over? Yes; they were all covered with cement.
4084. Did you notice any other alterations as between your first and second visits? No great alterations had been made as far as I could see.
4085. Did you not notice some bolts? The bolts are all in for the plates that go across the joints; they are well protected; they have oiled rags round them.
4086. Did you notice them on the occasion of your first visit? They were not in on the first occasion.
4087. When you first went to the works you found the work generally being done in a great deal more careless fashion than on the occasion of your second visit? No, I could not say that. The work itself is well enough done. It is to the interests of the patentees of a new system to do really good work there. I should not say that the work was in any way done improperly.
4088. It is fairly good work? Yes.
4089. Where do the bolts which you have described go in in the drawings; can you point them out; I understand that bolts have been put in where holes had been left? The bolts were put in at the joints.
4090. *His Honor.*] I suppose the openings were to be filled in with mastic? Yes.
4091. *Mr. Parkes.*] Would not rust be likely to get into bolts put in after the concrete is set? The bolts are passed through the side of the channel.
4092. After the concrete has set? Yes.
4093. Therefore the rust could get to them? Yes, I daresay it could.
4094. The concrete being set would not preserve them? No; concrete will preserve iron.
4095. *His Honor.*] Are not their heads covered over by the rendering in some way? I do not know about that.
4096. *Mr. Parkes.*] The point is this, your Honor: if the bolts were put in after the concrete had set could they be coated with the concrete? Not very well.
4097. *His Honor.*] But if the heads are countersunk in the concrete on the inside they would be covered by the rendering? Yes.
4098. *Mr. Davis.*] You regard three years as being rather a short term for which to ask the contractors to guarantee this work? With a sixty years' life it does appear a small term.
4099. You think it would be more reasonable perhaps to ask for a ten years' guarantee? Ten years is a long time for a guarantee; I think about five years would be a fair thing.
4100. Supposing your firm were asked to take a risk, you would not take it without being paid for it? We don't generally take any risk under ordinary circumstances. The commission for the work we do covers all risk.
4101. Suppose you asked one of your contractors to take a risk of the description which Messrs. Carter, Gummow, & Co. had to take in connection with this Monier structure, would you regard it as a fair thing for them to include in their tender the price of that risk? If I were asking them to take a risk I should consider the price they submitted would cover it.
4102. With regard to the estimate which you made of the compo. used in these arches, and which you submitted to His Honor when you were here previously, what would you allow for shrinkage of the material after it had been made up? It is a 3 to 1 composition. I allowed 1 of cement to entirely disappear in 3 of sand. I think that is a sufficient margin.
4103. Supposing you were told that it had been found from actual experiment that the shrinkage was considerably more than that, would you be surprised? I would not believe it.
4104. You said just now that the Monier structure was no new thing? I do not say the Monier structure, as regards aqueduct work, is not a new thing; but the putting of a grid in cement is no new thing.
4105. Do you say that you used a grid similar to this in work which you did ten years ago? Yes.
4106. Do you remember what you said on the last occasion you were here? I do not know what you are referring to.
4107. You think, perhaps, that it might not exactly tally with what you are saying to-day? I do not not know. I will tell you when I look at my evidence.
4108. You said, in reply to Mr. Parkes, at Question 2700-2701:—"We engineers in this country have not had experience of the Monier system, because none of it has been carried out here." That is as regards the Monier system in connection with aqueducts. As I said a little while ago I do not regard the Monier system—that is, the putting of iron into cement, and there is really nothing more in it—as a patent at all, because I did that work myself long enough ago.
4109. The question is whether you regard the putting of this particular kind of grid into compo. work as anything special; have you used that kind of structure before, or have you seen it used? Not in connection with aqueducts.
4110. So that what you did ten years ago scarcely applies to the case in point? I do not know that. The principle involved is the same. It is simply the putting of iron into compo. to strengthen it. That is really what the Monier system consists of.
4111. How did you get the area of the carrier in the case of Contract 112? By co-ordinates.
4112. Do you remember the greatest width and the greatest depth of the carrier? I do not.
4113. With regard to the comparative estimates which you have made in the case of Contracts 77, 101, and 112, would you have His Honor conclude that the ratio of carrying capacity necessarily goes with the cost of an aqueduct? No. Of course a good deal depends upon the depth of the piers.

4114. *His Honor.*] But suppose you had the same depth in the piers, and that the works are similar in every other respect, you would not say that the cost varied directly as the capacity, would you? A good deal depends upon the structure. G. McCredie.  
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4115. *Mr. Davis.*] Suppose you had a carrier with an area of 20 square feet, and another carrier with an area of 4 square feet—suppose the carrier with 20 square feet cost £5 a foot—would it necessarily follow that the carrier with 4 square feet would cost £1 per foot? No.

4115½. So that your comparison between Contracts 77, 101, and 112, as regards area, is not conclusive? As regards area.

4116. Is it conclusive necessarily as regards cost;—what would you yourself deduce from your comparison? Do you mean comparing the prices?

4117. *His Honor.*] Have you worked out a comparison on the theory that carrying capacity and cost of two similar structures vary directly as one another? No. I have worked out the quantities to compare them per foot running as a guide to the work they do, and I have taken the area for comparison's sake.

4118. You worked each out on its own basis? Yes.

4119. *Mr. Gummow.*] As to Contract No. 77, you told us that you saw some iron rods sticking out of the concrete? Yes.

4120. Do you know how they were put in and when they were put in? No.

4121. Do you know whether they were put in before or after the concrete was set? The ends I saw sticking out must have been put in while the concrete was being put into position.

4122. As to the bolts going through the expansion joints, were they galvanised? No; they were covered with oiled rags.

4123. Coming to the question of the capacity of the sewers,—allowing that the running capacity of the two sewers is equal, do you consider that the cost ought to be equal;—would you think that the cost depends upon area and capacity? It depends entirely upon the construction.

4124. Take the book I have in my hand as an instance; if I hold the book in one position, that is horizontally, you have an area facing you of about 8 inches by 1½ inches;—would you consider that the cost of the construction of a sewer of that shape would be the same as the cost of the construction of a sewer in the shape of the same area, such as you see when the book is held vertically? It depends entirely upon the construction and the quantity of water carried.

4125. When you alter the shape of the sewer, do you not alter the cost? That is a matter of calculation.

4126. But does it not do so? I could not tell you unless I calculated it.

4127. Would not the pressure upon the sides in the one case be much greater? It would be greater.

4128. Then would not the cost be greater;—would you not have to allow for greater strength in the walls for the different pressure? Yes; it would be a fairly upright structure.

4129. In point of fact, then, an equal carrying capacity in two sewers does not prove that they would be of equal cost? As I have already said, you must consider with the capacity the mode of construction.

4130. Has the grade anything to do with the cost? That is an altogether different matter.

4131. Has the grade anything to do with the carrying capacity? Of course it has.

4132. *His Honor.*] I suppose the grade has a good deal to do with the form in which you build your sewer;—the greater the grade the more friction you may put up with? Yes; it depends also upon whether you render with cement or other materials: that has also to be calculated.

4133. *Mr. Gummow.*] Take a cask of cement;—what is its value? I should say as much as a man could get for it.

4134. Would you blame a contractor for asking 20s. a cask for cement if he could get it? I should not blame him, but I should blame the man who paid him that price.

4135. *His Honor.*] You would blame the contractor if he said the cement was worth that I suppose? Certainly.

4136. *Mr. Gummow.*] As to this aqueduct, do you not consider that the experience you would gain from other persons' risk would be a benefit to you? Certainly.

4137. If it proved whether it would be a good article for the future requirements of your clients, would not that experience be of some value to you? Yes, undoubtedly.

4138. It would be of advantage to your clients if it did turn out to be a good and cheap article? There is no doubt about that.

4139. With regard to the original design of Contract No. 77, does the stone-work assist in strengthening the work—I mean the sandstone ashlar? It certainly assists in a measure to strengthen the work, although it appears to be more in the nature of an ornament than anything else.

4140. Would you take it into your calculations of strength? Yes, I should have to do so, because it binds the work to some extent. These large stones working in as a string bind the structure.

4141. Does the extra dead weight, resulting from the presence of the stone, compensate for the extra strength it gives the work;—would you not consider that the extra dead weight would be rather a source of weakness than otherwise to the whole structure? I do not regard these stones as a necessary appendage to the aqueduct; I believe it would be quite strong enough without them.

4142. *His Honor.*] You think that on the whole they would be better left out except for the purposes of ornament? Yes.

4143. *Mr. Gummow.*] Do you consider that ashlar or bricks increase in strength with age; for instance, in five years are they stronger than when they are put in? I would not say that. They do not increase in strength with age.

4144. Does cement mortar increase in strength with age? That improves with age.

4145. Does it with age increase in strength, do you consider? Yes.

4146. When it was three years old, would it not in point of fact be stronger than when it was three months old? That will depend upon circumstances. It would depend upon how it stood in the three years.

4147. *His Honor.*] Suppose that at the end of three years it shows no sign of cracking? Well, when I was speaking of the guarantee, before I mentioned five years on account of the life-time of the sewer, I should say that if the work lasted well for from three to five years it ought to last well after that. Five years would be a fair test, I think.

4148. You say it took you three days to take out the quantities of this work? Yes.

4149. Do you consider that an ordinary quantity surveyor in the Department is as smart a man as you are? Just as smart as I am.

4150. With regard to the patent, are you in a position to give us a sound legal opinion? I cannot do that. I have given you only my own opinion. 4151.



- G. McCredie. 4151. You are familiar with the aqueduct portion of the Departmental plan of Contract 77? Yes.  
 4152. And you know the plan of Ahearne's contract 101? Yes.  
 19 June, 1896. 4153. They have different carrying capacities—but putting that out of the question, and comparing the two as modes of construction of aqueducts, what do you say as to their cost—for instance, is No. 77 in construction a saving upon No. 101 or is it not? I think the plan of Ahearne's contract is a saving upon the plan of No. 77. The cost in the case of No. 77 is £5 1s. 3d. per foot run, and in the case of Ahearne's contract the cost is £4 15s. 4d. per foot run.  
 4154. No. 77 plan then is more expensive than Ahearne's? Yes, according to the quantities I have taken out.  
 4155. Then it is not correct to say that as between the planning of No. 101 Contract and the planning of No. 77 Contract the Department have found out how to save money in planning, and have applied the saving to No. 77;—you say that it is rather the other way? Yes.  
 4156. You think they have found out how to make the work more ornamental? Yes. The design for the aqueduct at Johnstone's Creek and at White's Creek is a first-class design; it is an ornamental design. The brickwork and the stonework make it particularly ornamental. It is altogether a more extravagant design than that employed in the case of Ahearne's contract.  
 4157. There is not more waste of material in the spandrils in Ahearne's contract than in the other contract? No.

William Thompson recalled and further examined:—

- W. Thompson.  
 19 June, 1896. 4158. *Mr. Parkes.*] When you were last examined you had only completed your estimate in regard to one of the aqueducts in the Monier plan of Contract No. 77? Yes, at Johnstone's Creek.  
 4159. Since then you have completed an estimate in regard to both aqueducts upon the contract? Yes.  
 4160. You have also completed an estimate in regard to the original Departmental plan? Yes.  
 4161. You have been very careful to check your estimates? Yes; I have checked them very carefully.  
 4162. Could you guarantee them? To within a yard or two. I should not like absolutely to guarantee them. [*Vide Appendix No. 17.*]  
 4163. In your undertaking to the Institute of Architects have you not to guarantee your quantities? Yes; all lithographed quantities are guaranteed.  
 4164. Therefore you cannot afford to make mistakes? No.  
 4165. Do you ever make mistakes? Not that I am aware of.  
 4166. Take the Departmental design in Contract 77;—what do you make the value of the work? £10,072 19s., including the excavation and footings; that is, for the aqueducts.  
 4167. Will you tell his Honor what would be the cost of the Monier substitute? £6,230 11s.  
 4168. That is for the two aqueducts? Yes; there is a difference between the cost of the two designs of £3,842.  
 4169. Your estimate of £6,230 for the Monier arch design includes everything, as in the other case? Yes, everything in connection with the aqueduct.  
 4170. In addition to these estimates you have made out an estimate in regard to Contract 112, have you not? Yes, the aqueduct portion.  
 4171. How does it compare with your estimate in regard to the Departmental plan of Contract 77? The aqueduct in Contract 112 runs out £5 7s. 1½d. per foot as compared with £4 19s. 8½d. per foot in the case of the aqueduct in Contract 77.  
 4172. Have you not run out the quantities and the proportionate cost in regard to the work outside of the aqueducts? No; because in the one case there were two straining chambers.  
 4173. Going back to the estimate I asked you to make in regard to Contract 77, that is for the original departmental scheme for work outside of the aqueducts, what do you make it? I used the Departmental prices, taking 28½ per cent. off. My quantities I found were within a yard or two of the Government quantities, so I used the Government quantities.  
 4174. Taking 28½ per cent. off, what do you make the value? £6,629; that is the net value.  
 4175. Have you made a similar estimate in respect of the Monier plan? Yes; the two aqueducts come to £6,230 11s.  
 4176. There is not much difference between the piers? Yes; there is more stuff in the Monier piers than the others.  
 4177. To what extent? I know that there is a fair difference.  
 4178. Will you make out those quantities and let us have them on a future occasion? Yes.  
 4179. *His Honor.*] Although there are fewer piers in the Monier plan, they are so much larger that the aggregate is greater? Yes.  
 4180. *Mr. Parkes.*] You show the concrete in the quantities you have taken outside of the aqueducts? Yes; it would include the footings and the sewers and the retaining-walls.  
 4181. The difference that you make between the aqueducts in the two cases is £3,842, and that includes all the piers and foundations? Yes.  
 4182. That £3,842 is the difference after you have allowed for a fair percentage for builder's risk, profit, &c.? I have made them both out on working costs.  
 4183. The usual working costs? Yes.  
 4184. What is the percentage you have allowed on the working cost? I have not allowed any percentage on that; I have put it into the labour in each case.

Frank Moorehouse Gummow recalled and further examined:—

- F. M. Gummow.  
 19 June, 1896. 4185. *Mr. Andrews.*] You are one of the members of the firm of Carter, Gummow & Co.? Yes.  
 4186. At the time Mr. Hickson, jun., was engaged by the firm, you were carrying out a contract in Adelaide? Yes.  
 4187. Mr. Carter and Mr. Snodgrass were looking after the firm's contracts in New South Wales? Yes.  
 4188. You and Mr. Gillan were the only partners in South Australia? Yes; we were the resident partners there.  
 4189. Will you tell us what was the first you heard in regard to the connection of Mr. Hickson, jun., with the firm? It was in a letter from Mr. Carter to myself, telling me that he had engaged Mr. Hickson,

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Hickson, jun., to assist me in Adelaide. I wrote back to him telling him that it was all right, and asking him to send Mr. Hickson on.

4190. At that time you were carrying out a rather difficult job in Adelaide? Yes.

4191. Was it necessary for the firm to have anyone there to assist you? Undoubtedly.

4192. You being a civil engineer? Yes.

4193. Had you received at that time any assistance from any other member of the firm? Yes, Mr. Snodgrass.

4194. Who also is a civil engineer? Yes.

4195. Had he to leave Adelaide? Yes; he had duties in Sydney.

4196. Did you ever receive a telegram from Mr. Carter in connection with Mr. Hickson, jun.? I believe I did.

4197. Will you tell us what was in the telegram? I am speaking from memory, and I cannot be certain of the words, but I think he wired to me to this effect—"that Mr. Hickson, jun., was leaving to come over to Adelaide." My recollection is that the wire was sent when Mr. Hickson was leaving, and after I had received Mr. Carter's letter. I could not speak definitely on the point, but I feel pretty sure that Mr. Carter did wire to me that Mr. Hickson was coming to Adelaide.

4198. Excepting that telegram, did you ever receive any other telegram about Mr. Hickson, junr.? I believe I received one other, about Christmas, 1893.

4199. After Mr. Hickson, junr., had left Adelaide? Yes; that is the only other telegram I can think of. It was to ask me if he could stay for another week in Sydney, where he had been for a holiday.

4200. Was Mr. Hickson, junr., ever a member of your firm? Never.

4201. Was there ever any intention on the part of the firm of making him a member? Never; not on my part, anyway.

4202. You heard Mr. Hickson, junr., tell His Honor on Wednesday what remuneration he received from the firm? Yes.

4203. Under all the circumstances, do you consider that a fair remuneration for a person carrying out the duties he had to discharge? Yes; I consider it a fair remuneration.

4204. It was not an excessive remuneration? No.

4205. Did you ever tell Mr. Gillan that you had received a telegram stating that Mr. Hickson, junr., was to be taken into the firm at any cost? Never.

4206. You yourself never saw such a telegram from anyone? Never.

4207. In connection with the correspondence between the members of the firm in Sydney and Adelaide by whom was it carried on? By Mr. Carter and myself.

4208. As far as you know was any correspondence carried on between Mr. Gillan and any member of the firm but Mr. Carter? Not that I know of, and I only remember Mr. Carter writing to Mr. Gillan on one occasion when he was in Sydney a few months ago. I remember saying to him, "I am too busy to write to Gillan my usual weekly budget. Scribble off a few lines to say that we are all well, and hoping that he also is going on all right." That is the only occasion on which he wrote to him to my knowledge. I was then sitting beside him at Forest Lodge.

4209. When Mr. Hickson was in Adelaide all the payments made to him were on account of his salary? Yes.

4210. Can you say whether he ever received any sum of money whatever from the firm except his salary—the money he was told he would receive for travelling expenses—and the two months salary in connection with his three months notice? No other money was ever received by him from the firm.

4211. You have checked all the accounts of the firm from the date of Mr. Hickson's entering your employment up to the time he left? Yes; and I am satisfied they are all correct.

4212. From those accounts you are positive that he never received any sum of money except those I have mentioned? I am positive. He was with me in Adelaide up to last June or the end of May, and he never received anything there except his salary. I think we paid him some expenses he incurred in coming to Adelaide from Sydney, but that is all. I am not sure whether I paid him the money, but I am sure he got it.

4213. Between yourself and Mr. Hickson was there ever any conversation as to his becoming a member of the firm? Yes.

4214. Will you tell His Honor what it was and where it took place? I can tell you the last one we had on the subject. He was often staying at my house in Adelaide, sometimes for a few days, sometimes for a night, and sometimes for an hour or two. We often talked about business and about all sorts of subjects. I can tell you the last conversation we had upon the matter to which you refer; that took place at Forest Lodge. With regard to the other conversations I always told him that I did not consider that there was any chance for a young fellow going into contracting either with our firm or with any other firm, and that if he could keep his position as an employee he would be far better off.

4215. May I take it that as far as you are concerned there was never any serious intention whatever of this young fellow becoming a member of the firm? Not the slightest.

4216. And he could not become a member without your knowledge? No.

4217. Did Mr. Hickson, senr., at any time whatever speak to you with regard to his son? Yes.

4218. About his becoming a member of the firm? No.

4219. Did he ever speak to you about his son being employed by the firm? Yes.

4220. When was that? When I came up from Adelaide I made it my business to call upon Mr. Hickson's father, and to tell him how his son was getting on. I did so as a matter of courtesy. I considered it my duty to inform him how his son was getting on, whether he was doing well or otherwise.

4221. Mr. Hickson, senr., never asked you to take his son into the firm or to give him employment? Never.

4222. But as you were in Sydney you saw his father and told him how his son, Mr. Hickson, junr., was getting on? Exactly.

4223. *Mr. Parkes.*] You say that you received a telegram from Mr. Carter about Mr. Hickson, junr.,—could you tell me the date of that telegram? I could not.

4224. Could you tell us the date approximately? It was about two or three days before he arrived in Adelaide the first time.

4225. It would be close to the date upon which the firm engaged him? Yes. I believe that Mr. Carter wired

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wired to me that Mr. Hickson, junr., was leaving. That is my impression; I would not swear to it absolutely, but I am under the impression that Mr. Carter wired to me.

4226. Have you never had any conversation at all with Mr. Hickson, senr., about his son becoming a partner in the firm at any future time? No; but I will tell you what I said to Mr. Hickson, as nearly as I can recollect it. I called upon Mr. Hickson after I had been here a few days, and told him how his son was getting on.

4227. *His Honor.*] Did you see him on each occasion of your coming to Sydney? I came up three times in the three years.

4228. But when did this particular conversation you are about to refer to take place? I cannot remember. The conversation upon each occasion was upon the same points,—that is, as to how his son was getting on, how he did his work, whether he looked well, and general questions of that sort which a father would naturally ask about his son. I remember that on one of these occasions I said to his father that I did not see much prospect of his son getting on in the outside world as a contractor.

4229. *Mr. Parkes.*] What brought up that conversation? The conversation was brought up through my considering Mr. Hickson might have heard of the matters which I have already mentioned with regard to his son.

4230. When would that conversation be likely to take place? About eighteen months, I think, after Mr. Hickson, junr., had been in our employ. It was very similar to what I had already told the son—that I did not see much chance of a young fellow getting on as a contractor. I had spoken to the son upon the subject before, and I thought it probable that the son would send word to the father, and I told him all that I thought it right to tell him with regard to his son's connection with the firm.

4231. Did the father make any suggestion at all about his son going into partnership with the firm? Not the slightest. I merely said what I did in conversation to give the father information about his son.

4232. What did Mr. Hickson, senr., say in reply to your expression of opinion? I do not know that he said anything. I was really carrying on the conversation, and, as he was engaged at the time with his duties as Engineer-in-Chief, I did not wish to occupy his time. I told him how his son was getting on, and I then came away. I think I asked him if he had any message or parcel to send him, and that is all.

4233. Do you know whether Mr. Hickson, junr., made any application for employment in Western Australia before he left you? I do not know.

4234. How long after he gave you notice did he leave? He did not give us notice. We gave him notice. As I have said before, we had various conversations about his prospects. I remember his once asking me whether he was likely to be kept on, and I said, "Well, Hickson, you know as much about it as I do. If we do not get any contracts you will have to go. If we do get them we will keep you." We tendered for the adjoining contract to No 77, late in March, and we tendered late in March also for a railway deviation. If we had obtained either of those jobs Mr. Hickson, junr., would have been kept on, but we got neither. I remember him coming to me and saying, "No 118 is nearly finished, am I to go to the outfall?" I said, "No. The Government have adopted a system under which they do all the levelling themselves and there will be no need for you to be there. I can do what is required."

4235. Is it not a good arrangement for the contractors to have the Government doing all the work? On the contrary it is a bad arrangement; we prefer to do it ourselves.

4236. Would you not prefer it to be done at the State's expense? It does not save us very much expense. It saves us £5 a week sometimes, the cost of keeping on an engineer, but as members of the firm themselves are able to do the work, provided they have the time, it does not mean very much.

4237. Why did you not employ Mr. Hickson, junr., during the whole of the 3 months, seeing that you paid him for that period? We gave him notice on 1st April that his services would not be required after 3 months, and he came to me a fortnight later and said, "I think I am going to Western Australia." I said, "When do you think of going?" He replied, "Whenever you can let me. I should like to go as soon as I can." I said, "We have no objection. You can go whenever you like." He said, "I shall not be going for a fortnight. I suppose I can make arrangements, however, to pack up." I told him that he could, and he also said "I shall keep in touch with you all the time. I shall be still working for the firm. I can do anything you like; but I should like to have a day or two off." I said, "You can suit yourself. We do not want to stand in your light if you want to better yourself. We are pleased to hear that you are endeavouring to better yourself." About the end of April he came to us and said, "I am leaving my lodgings. Can you settle up with me?" I said "Certainly," Mr. Carter was there and drew out a cheque for three months' pay, Mr. Hickson did not ask for any particular sum and we merely gave him that amount considering that we had given him three months notice. We were quite willing to let him go if he could better himself. I do not know that we should have allowed him to walk round Sydney drawing our money; but as he thought of getting to Western Australia as quickly as he could in order to get on in life, we did not stand in his light.

4238. Had you not prospects of getting further contracts from the Government? We have now.

4239. But with a slight cessation of work you do not send your officers away? No, I could not say that; but we could see plainly the way work was cut, and, when a contract adjoining us, and which we thought we had such a big chance of getting, did not come to us, we thought it was of no use paying salaries to persons to walk about in the meantime.

4240. What was your percentage below the Government rates in the case of Contract 117? I am not sure whether it was 28 or 40.

4241. The contract was taken at 10 per cent. below Government prices? At 9 per cent. I think our tender was 28 per cent. or 40 per cent. above.

4242. *His Honor.*] You tendered above the schedule rates then? Yes; we were top; I know that; but I do not remember the percentage.

4243. *Mr. Andrews.*] Do you remember Mr. Gillan leaving Adelaide to come to Sydney about May, 1895? Yes.

4244. Did Mr. Hickson, junr., come to Sydney with him? No.

4245. Can you swear positively that on 27th May, 1895, Mr. Hickson, junr., was in Adelaide? He was in South Australia.

4246. He had not been away from South Australia from January of that year up to that date? No. I saw him every second day, if not every day.

4247. In no case was he away sufficiently long to enable him to come to Sydney? No.

4248. With regard to the last contract you have just spoken of you say that you tendered at 28 per cent. on? At some percentage on.

4249.

4249. Is it not a fact that the rates allowed in the Government schedule for that contract are very different from the rates allowed in the case of Contract 77? Yes.

4250. And that accounts for the difference so far as you are concerned? Yes.

4251. *Mr. Parkes.*] Is it not a fact that the rates allowed in the second contract are 100 per cent. below? Yes. In regard to some of the items.

4252. For instance the item excavation for tunnels is 120 per cent. below? I could not say without looking at the schedule.

4253. At all events the excavation, the concrete work, and all the large items are very much below? Yes.

4254. *His Honor.*] Was the excavation in that case in softer country? The rock might be softer, but the tenderer could not tell. There would not be a very great difference. The tunnel in country which is apparently the same will be at 40s. a yard forward, while the other would have cost 55s. It depends upon the lay of the country; the strata vary. The ground may be rising and falling.

4255. I believe the deeper you get into the sandstone the harder it is? Not necessarily. Sometimes the surface is the hardest, and the hardest country is not always the most difficult. The worst country is what is known as tough country. In some cases you can bore your holes, but it will not shoot properly.

4256. As to Mr. Hickson jun.'s ability to do work, what sort of a man was he? He was quite capable of doing any work with a theodolite or level which would be necessary on the Adelaide contract. He could take out quantities, make drawings, or do anything it was requisite to do for the carrying out of the work. I am an engineer myself, and he acted as my assistant.

4257. When you say that he was quite capable, do you mean that he exercised his capability;—you do not mean to draw a distinction between his being capable of doing a thing and his doing of it? Perhaps I had better explain the nature of his work. We had shafts 300 feet, 380 feet, and 500 feet down. We had to throw lines from the alignment on the surface. That was the most difficult work there was to do. They were about 9 feet apart. The wires were put down and were weighted at the bottom, and they were allowed to get steady. You then had to take the instrument down and put it on the same plane as the two wires; that necessitated very accurate work, and great pains had to be taken, and we had to do it on Sundays. We were sometimes working on Sundays from twelve to sixteen hours at it. I would do the work one Sunday and he would check it on the next Sunday. He would do the work on the following Sunday, and I would check it the following week, and so on. The Government in South Australia threw all the responsibility on our shoulders for the lines and levels, and they were continually writing to us to remind us of our responsibilities.

4258. *Mr. Parkes.*] That is the proper system is it not? I wish the Government would adopt it here. Before the South Australian Government will touch the work we have to do the alignments and levels. In some cases we had to expend two or three months at one shaft. They asked us what we made the reading then. We would compare notes and strike an average, and if they were not satisfied we would have to do it again and so on. It was a matter of trial and average.

4259. *His Honor.*] And you found Mr. Hickson junr.'s work in that relation good? Yes, thoroughly good.

4260. He was a man who did his work,—he did not loaf about? I will explain the nature of his work. He might have nothing to do for three or four days. We were not upon a contract where varying constructions were going on. It was the same old construction from week's end to week's end—continuous driving for months at a time. At times he might not have anything to do for a week. He could be spared for a week at a time, but on Sundays he would probably have to put in from twelve to sixteen hours, starting sometimes at 4 o'clock in the morning and knocking off at 8 o'clock at night. If Mr. Hickson wanted to get away for a couple of days to play a cricket match, or tennis, or anything of that kind, there was never any bother about it. If he were not required I would say "You can go and have your game of tennis or cricket." Of course he always let me know if he wanted to get away. Otherwise he was on the works every morning seeing what was required.

4261. When he went away to take part in a cricket match or anything of that kind was he up to time when he was wanted? Yes.

4262. So that it would not be correct to say that he loafed about taking photographs and doing nothing else? I think that referred to Forest Lodge and not to Adelaide. He did take some photographs at Forest Lodge, but he did all the instrument work there. I did not look through the instruments once there. He made measurements for all the workmen and all that kind of thing.

4263. Did he do it regularly? Yes.

4264. Steadily and properly? Yes.

4265. At intervals he may have been amusing himself by taking photographs? Yes, and we have a little pleasure ourselves when we go to cricket matches—sometimes for six or eight days in succession. At the same time we do not neglect our work if there is work to do. If any of our employees want to go away occasionally for a game they can go. We have no hard and fast rule in our engagements.

4266. *Mr. Smith.*] You always found, in regard to Mr. Hickson, jun., that when there was work to be done he was on the spot ready and willing to do it? Yes.

#### MONDAY, 22 JUNE, 1896.

John Carter recalled and further examined:—

4267. *Mr. Parkes.*] I suppose there is no doubt as to the correctness of your statement that your firm kept no books? That is correct.

4268. Did not some financial agent keep books for you? No.

4269. At no time? No.

4270. No accounts? No.

4271. You have never had your accounts audited? No.

4272. There is an amount repeated frequently in your pass-books, £52. 10s. for W. Manning;—who would that be? Sir W. Manning.

4273. Was that in connection with any financial work? It had nothing to do with our contracts or anything else of the kind—it was a purely private matter.

4274. Then there is a payment appearing in one of your books to Henry Rudolph? That is a purely private matter also.

F. M.  
Gumnow.

19 June, 1896.

J. Carter.

22 June, 1896.

4275.

- J. Carter.  
22 June, 1896.
4275. Was that a payment to an inspector? No.
4276. No books, you say, were kept other than these pass-books? No.
4277. You said you drew some of your cheques over the counter of the Bank of New Zealand? Yes.
4278. Had you no office at any time? No. We had temporary offices—boxes on the works. That is all.
4279. Did you keep no other books of any description to which you transferred amounts from the bank-books? No. We kept no books at all. I think that is very definite.
4280. Had you no private accounts to which you transferred moneys? Of course, I had my own private account at the Commercial Bank at North Shore. It was a small account for ordinary purposes—for household expenses, and so on; for nothing else.
4281. What are the red marks which appear in some of these passbooks? They are the bank's figures—the ledgerkeeper's figures.
4282. How were your partnership profits apportioned;—by your deed you had to divide your partnership profits for a certain period? I must say that that deed, so far as we are concerned, is so much waste paper, although it was drawn up by a very good firm of solicitors, Messrs. Minter and Simpson. I believe they put everything into it in the usual way. [*Vide Appendix No. 19*].
4283. You all signed the deed; it stands as a legal document? Yes; but we never acted up to it.
4284. Suppose one partner took action against another, it would stand as a legal document, would it not? Yes, I suppose so.
4285. It is in operation at the present day, is it not? No.
4286. When was it cancelled? When we paid Mr. Maddison and Mr. Ewing out of the firm.
4287. But this deed continued according to your notice to the public, did it not? Not that I am aware of. [*Vide Appendix No. 20*].
4288. Does not your notice to the public say so;—does it not say that the agreement so far as Maddison and Ewing are concerned is at an end, and that you would continue the business under the same style of Carter, Gummow, & Co.? Yes.
4289. Although the partners remaining at that time continued in the firm, you had no fresh deed of partnership? No.
4290. No fresh document was executed? No.
4291. The moneys in respect of Contract 77 were all paid into the firm of Carter, Gummow, & Co.? Yes.
4292. To what partners did those payments apply;—did they apply to the remainder of those enumerated in this deed? No; some had gone out. There are three less now. Mr. Snodgrass retired six months ago.
4293. The firm consists of the whole of the members mentioned in the deed with the exception of three? Yes; Mr. Snodgrass and Mr. Maddison and Mr. Ewing are not in the firm now.
4294. According to the payments made into your banking account the whole of the remaining members of the firm participate in the profits, if there be any profits? There is not any firm.
4295. Still this document would hold good supposing any of the partners were to take action? Only so far as the Adelaide contract is concerned. It is only in existence for the Adelaide contract.
4296. Only for that? That is all. That is my interpretation, but of course I may be wrong.
4297. Does not the deed refer to contracts proceeding in Sydney and Adelaide? I do not think so. I have not seen the document for some years. I have never had occasion to refer to it. We have had a rule-of-thumb way of doing business which might not have been quite correct, although it suited us.
4298. Is there no other partnership deed in existence besides this one;—is it not a fact that the whole of the members of the firm participate in the working of Contract 77? I wish it to be clearly understood that there is not any firm. You and I are arguing upon different lines. Four persons participate in any profits which may arise from Contract 77; but they are not a firm. There is not any firm in existence containing those four names.
4299. Is there any document cancelling this deed of partnership? No.
4300. *Mr. Gummow.*] As to this deed, you can tell by reading it whether it refers to any Sydney contracts or not? Yes. My impression is that it refers only to the Adelaide contract.
4301. Do you remember going to Johnson, Minter, and Simpson, after Mr. Maddison and Mr. Ewing had gone out of the partnership, with reference to a fresh deed of partnership? Yes.
4302. Whom did you see? Mr. Williams.
4303. Did we go into the question of a fresh deed of partnership between yourself, Mr. Snodgrass, Mr. Forrest, Mr. Gillan, and myself? We did.
4304. Was that deed ever carried out? It was not.
4305. *His Honor.*] I understand that there are four interested in Contract 77—that would be yourself, Mr. Gummow, Mr. Forrest, and Mr. Gillan? Yes.
4306. There is no deed of partnership binding you—you are in a position of co-contractors? Yes; we are what might be termed a contracting syndicate. The business is carried on merely upon those lines. There is no partnership.
4307. How used you to manage when profits had to be distributed at the end of a contract? I am glad of an opportunity to explain that. Our method of procedure in regard to contracts is this: We pay our wages fortnightly on temporary pay-sheets, and there is no signature or anything of that kind obtained from the men. Every month our measurements are made up by the Government. We do not even keep measurement books of our own. We have access to the Government books, and the measurements are made up by the Government engineer in conjunction with the contractor in charge of the work. The vouchers are paid on order by the Treasury. We never see them. Every month Mr. Gummow and myself, when he is here, and Mr. Snodgrass, when Mr. Gummow is not here, make out temporary balance-sheets to see how matters are going. We obtain our balance from the bank, noting what the Government owe us in the way of monthly progress payments. Outstanding accounts would be taken into consideration, and if a retiring partner wished to be paid up we should take our balance from the bank, credit or debit, as the case might be. We know from memory pretty well how much the Government owe us in the shape of deposit as security, and when we have paid the outstanding accounts of merchants and others a balance would be struck, and the resulting amount divided. That, shortly, is our method. If a contract was not completed we estimated the profits resulting from the balance of the work, and that was also taken into consideration.
4308. *Mr. Smith.*] You said just now that there were four persons interested in Contract 77? Yes.
4309. You, Mr. Gummow, Mr. Forrest, and Mr. Gillan? Yes.
4310. The original tender was signed by three persons, yourself, Mr. Gummow, and Mr. Snodgrass? Yes.
4311. That was on 13th March, 1895? Yes.

4312. The tender is signed Carter, Gummow, & Co., and it is also signed by yourself, by Mr. Gummow, and Mr. Snodgrass? Yes.
4313. Those names do not, owing to a mistake, occur in one of the printed papers? Yes.
4314. When did Mr. Snodgrass go out of the business? At the beginning of this year.
4315. When did Mr. Forrest and Mr. Gillan come in? They came in very soon after we had completed the contract.
4316. *Mr. Gummow.*] I understand you to say that our pay-sheets were all loose sheets? Yes.
4317. You do not know where they are at the present time? Not all of them.
4318. What is the reason of the change which has now been made as regards those pay-sheets? Well, a more methodical man in the person of yourself has taken charge of the contract. Another reason is that we are breaking in a son of Mr. Forrest to the contracting business, and we decided that it would be only fair to teach him a little more business method than we have hitherto followed ourselves. The pay-sheets are now bound up, but they are in other respects similar to those formerly issued.
4319. As a matter of fact, when I got them bound, what was your opinion? I looked upon it as a fad, and I made some joking comment upon it.
4320. *Mr. Parkes.*] Does not clause 1 of the deed of partnership say, "The said parties hereto will become and remain partners under the name, style, or firm of Carter, Gummow, & Co., of the trade or business of contractors, for the purposes of carrying out and completing the contract hereinbefore referred to, and any other contracts which the said parties shall mutually agree upon and shall obtain;"—there can be no doubt, I suppose, but that that covers all your contracts? Yes; but we must mutually agree. I could stand out or Mr. Gummow could stand out.
4321. But you mutually agreed upon Contract 77, did you not? Not under that deed.
4322. You have no other deed? We have no deed at all.
4323. This deed goes on to speak of contracts in the plural number all the way through? Possibly; but I cannot help that.
4324. *Mr. Gummow.*] You say that the deed refers to the Adelaide contract only? Yes.
4325. Is the Adelaide contract finished yet? No; we actually joined forces for the purpose of carrying out that particular contract. It was the first time that Carter, Gummow, & Co. came into existence.
4326. Did you ever carry out any other contract in Adelaide? Yes, we carried out the shafts contract.
4327. Had we a deed for that? No. I should explain that I have always regarded the two Adelaide jobs as one.
4328. Were they one? No; one was taken some considerable time after the other.

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William Thompson recalled and further examined:—

4329. *Mr. Parkes.*] You have now your estimates of quantities completed? Yes; I hand in the list. [*Vide Appendix No. 17.*]
4330. You make Contract 77 according to the departmental plan to represent £16,690, taking the whole of the work? Yes; that includes everything.
4331. You made an estimate of the value of the Monier plan in 77 Contract? Yes; I make it £12,850.
4332. There is a difference in value in favour of the Monier plan then of £3,840? Yes.
4333. You have made estimates comparing Contracts 77, 101, and 112, have you not? Yes.
4334. Will you tell His Honor what they are by the lineal foot? Yes.
4335. *His Honor.*] You mean as they go, as they actually run? Yes. My estimate for 101 is £5 9s. 1d. a foot lineal for one sewer; that is for the carriers and aqueducts portion; at the contract prices it comes out at £5 17s. 7½d. per foot lineal. In regard to 112 I estimate for one carrier £5 7s. 1½d. per foot lineal.
4336. *Mr. Parkes.*] What is your estimate in connection with 77? £3 1s. 8½d. per foot taking the Monier system, and taking the departmental plan £4 19s. 8½d. per foot lineal.
4337. Did you take out the area of the carriers in the case of 112, 77, and 101? Yes; the carrier in the case of 112 had an area of 41.24 feet, that is the total area; in the case of 101 of 28.27 feet; and in the case of 77 of 13.32 feet.
4338. Therefore the carrier in the case of 112 is more than three times in excess of the carrier in the case of 77, as regards area? Yes.
4339. Before we go any further into these figures, I want you to look at the tender forms of Contracts 112, 101, and 77; what, for instance, is the price set down for bluestone concrete, in the ordinary form, in the case of No. 77? £2 10s. a yard is set down for bluestone concrete in any situation. [*Vide Appendices Nos. 21, 22, and 12.*]
4340. What is it in the case of 101? 34s.
4341. In the case of 112, what is the price? £2 5s.
4342. So that the price in the case of 77 exceeds the other two, does it not? Yes.
4343. What is the price set down for special bluestone concrete in the case of No. 77;—I mean the schedule to the original plan? £3.
4344. What is the price of special bluestone concrete per yard in the case of 112? £2 15s., including the placing in position of the mastic plates and bars, damp course, &c.
4345. What is the price in the case of 77;—it is £3 without any iron, is it not? Yes.
4346. The material is of the same nature, as far as you can see? I think it is rather better in the case of 112, because it is 1, 1½, and 3.
4347. You mean better than in the case of 77? Yes.
4348. And yet it is set down at £2 15s.? Yes.
4349. Including all the ironwork? Yes.
4350. *His Honor.*] What is the composition of the special bluestone concrete in the case of No. 112? One of cement, one and a half of sand, and three of ¼-inch blue metal.
4351. *Mr. Parkes.*] Yet, including the ironwork, it is put down at 55s., as against 60s. in the case of Contract 77? Yes.
4352. What is the brickwork set down at in the case of 77? £2 10s. a yard in the Government schedule.
4353. What is the brickwork marked at in the case of 112? That is a different class of brickwork; it is set down at 35s.
4354. In the case of No. 101, Ahearne's contract, what is the brickwork marked at? 44s.
4355. What is cement facing marked at in the case of 112? 2s. per square yard.

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4356. And in the case of No. 77, what is it? 2s. 3d.  
 4357. Take freestone ashlar, what is that in the case of 112? 3s. per cubic foot.  
 4358. What is it in the case of 77? 3s. 6d. per cubic foot.  
 4359. Taking your own figures and the departmental figures in regard to the three designs—that is, the departmental design in the case of 77, the design of 101, and the design of 112—which is the most costly in proportion to its size? The departmental design of 77, certainly.  
 4360. For what reason? Because there is a good deal of ashlar masonry and double-pressed brickwork in it.  
 4361. It is a rich design? Yes, far more ornamental than the others.  
 4362. Taking the nature, quantity, and price of material, it exceeds the cost of 101 in proportion? Yes, proportionately.  
 4363. So that there can be no doubt that, seeing that it exceeds 101 in cost, and that the cost of 101 exceeds, according to your estimate, the cost of 112 by 2s. a foot lineal, it is impossible for the original departmental plan of Contract 77 to have been based upon the estimate taken out for 112? I did not go into the departmental estimates, I simply worked out my own.  
 4364. But there can be no doubt, can there, that the departmental plan of Contract 77 was not based, as regards work of the same nature, upon Contract 112? No; they apparently reduced their prices a little in the case of 112.  
 4365. Does not the cost of 77 exceed that of 112? Yes, as regards the schedule prices.  
 4366. Would it not be a fair thing, taking the relative estimates as regards 112 and 77, and seeing that in 112 the capacity of the carrier exceeds that in No. 77 by over three times, to divide the cost, viz., £5 7s. 1½d., by two? Well, 112 is rather lower; it does not go the same height as 77.  
 4367. But taking the relative cost of material? Yes, perhaps it would be fair; but I would not like to say off-hand.  
 4368. *His Honor.*] Can you form an idea as to how to reduce the cost of the bigger aqueduct to get at the cost of the smaller aqueduct? I do not know how you could do it. You would have to have the whole thing sketched out, and go into details.  
 4369. *Mr. Parkes.*] You could judge it pretty well, could you not, by the material in the two cases? Yes.  
 4370. The material in 112, as regards cost, is far below the material in 77? Yes; there is no doubt about that.  
 4371. And the capacity is three times that of 77? Yes.  
 4372. At the same time the cost of each is almost equal? Yes.  
 4373. The material is not much greater in proportion, although it is more expensive? Yes.  
 4374. Now that you have looked into the matter, will you tell His Honor how you arrive at your quantities of compo.? Yes. I have had prepared a statement, which I will now hand in, as regards the various items. As regards the compo. of 1 to 3, I have allowed 30s. per yard cube. According to Hurst's tables, and that is one of the standard authorities, 8·13 cubic feet of cement, 24·39 cubic feet of sand, and 37 gallons of water are equal to 1 yard cube of compo. I have taken 2½ casks of cement at 9s. 6d., making 19s. 9½d.; 25 cubic feet of sand, making 2s. 6d.; labour in mixing, 1s. 3d.; centres, 2s.; labour in placing, 4s. 5½d. A small mortar mill will mix 25 yards per diem, and I have allowed a man to deposit 1½ yards per diem, or 13 large barrow loads. As regards the centres I have allowed centering for 2 arches, and 80 feet lineal of channel. It comes out at about £99. I have allowed for the 990 yards of compo., at say 2s. per yard, under that heading. [*Vide Appendix No. 17*].  
 4375. So that as far as bluestone concrete goes you think the Government have put down an excessive cost for the compo.? Yes.  
 4376. You know as a quantity surveyor that bluestone concrete is a better material;—you have seen both materials tested? Yes; I have seen them tested. The bluestone concrete—I mean, of course, the small stuff—is much better.  
 4377. Is it less likely to shrink than compo.? I cannot say.  
 4378. *Mr. Davis.*] With reference to the shrinkage in the compo. what have you allowed, taking first of all the quantity of sand and the cubic feet of cement? I have taken it according to the table to which I have referred, and it comes altogether to 33 or 34 feet for the material.  
 4379. That means a shrinkage of how much? 6 or 7 feet.  
 4380. About 12 per cent.? Yes.  
 4381. I presume that if you were told that the actual shrinkage had been taken of material which had been used, and that it had been found to be three times the amount you named you would be a little bit surprised? It would be going against all the standard authorities.  
 4382. But you would be a bit surprised to hear that it was so;—I presume that what had been actually done on the ground with the materials that are being used would be nearer the mark than anything you could get from a book like Hurst's? Yes; the nature of the sand might vary slightly.  
 4383. So that that would upset your calculations a little? Yes, if you are correct.  
 4384. With reference to the centering, you say you allowed in your estimate for two centres, and for the boxing of 80 feet of carrier;—did you not see more centres than two being used? No, I did not.  
 4385. If the Department insisted on four sets of centres being used, and if the contractors have to provide those centres, I presume that it would be a fair thing to allow in the prices? Certainly. If they had to provide more centres, but there are only two actually there.  
 4386. As to the boxing, I believe you have had no actual experience in this kind of work? No.  
 4387. Supposing it were found to be a fact that the boxing would last only about four times—that is, that it could be set up only four times and would then have to be renewed, that would rather upset your calculations would it not? A little, perhaps.  
 4388. As to the labour you have included in your estimate, how did you arrive at that? Upon the assumption that a man would do so much in so much time.  
 4389. It is just an assumption on your part? Yes. No one in the Colony has had any experience in connection with compo. in this class of work.  
 4390. Supposing we have had practical experience in this class of work, and suppose that it has been found to cost more than you have allowed as far as labour is concerned, would not that upset your calculations again? Of course these things have to be tested.  
 4391. In your estimate of the Monier structure what foundations did you allow? I allowed for foundations down to the level shown on the drawing. 4392.



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4392. Are there any foundations shown upon the Monier plan? No.
4393. Then any foundations which you have included are also a matter of pure assumption? No; I have gone down to the rock level as shown on the plan.
4394. Is it not a fact that you have assumed a level for the bottom of your piers? No; it is not an assumption, because the bottom is shown on the other drawing.
4395. The level of the rock is not shown underneath the piers in the Monier design? No.
4396. Then is it not an assumption on your part to give the levels of the bottom of the piers in the way you have done? No; I do not see that, because I have taken them from the other drawing which shows the rock level.
4397. In other words, you have transferred levels of rock which you have found in the departmental design on to the Monier design although the points where the rock is given do not correspond with the base of the piers at all; you say that it is not an assumption to draw a line of rock yourself? No, not altogether, because the rock is shown so clearly in the Departmental plan.
4398. As to Contract 112, I think you told His Honor that in that case there were three sewers? No; I said that in regard to Contract 101.
4399. From the estimate of comparative cost you have made as between 77, 101, and 112, do you wish His Honor to understand that it is possible to draw any conclusion from the making of an estimate of that description? No; I do not want His Honor to draw any conclusion. Mr. Parkes asked me to make these estimates, and I have made them.
4400. You know, as a matter of fact, that the shape of the sewer, the thickness and area of the brickwork, and the height of the carrier all have something to do with making up the cost per foot run? Yes.
4401. So that the price at one place for a comparatively large carrier might be less than the price at another place for a smaller carrier? Yes. I do not say that you can gauge the carriers and the relative cost at all.
4402. You have obtained certain quantities from Hurst, and I should like to know what quantity of water you propose to use in the compo,;—would the quantity put in have anything to do with the shrinkage;—would it affect it in any way? Yes.
4403. Do you know what quantity of water is being used in the compo. upon Contract 77? No.
4404. So that really you do not know what shrinkage to allow? The water does affect the shrinkage, of course. If the compo. has to be brought to a certain consistency a certain amount of water would have to be used.
4405. You do not know the consistency of the compo. that is being used? No.
4406. *Mr. Gummow.*] As to the number of centerings which are being used in connection with Contract 77, how many do you say were there when you visited the contract? I saw two in one aqueduct.
4407. Do you know if there were any more? I do not. I simply went by the first aqueduct I came to.
4408. As to the special bluestone concrete, I understood you to say that the ingredients were 7 of metal, 3 of sand, 2 of cement? Yes.
4409. Would you consider it a stronger construction than concrete—5 of metal, 3 of sand, and 2 of cement? No, certainly not; but in the case of 112 it was stronger than that.
4410. What were the ingredients in 112? 1, 1½, and 3, or 2, 3, and 6.
4411. Is that as strong as 2, 3, and 5? No.
4412. Which would be the stronger? 2, 3, and 5.
4413. *Mr. Parkes.*] You base your opinion as to office designs in Contract 77 being more costly in proportion to the others from the materials used and from the cost of them? Yes.
4414. *His Honor.*] Did you specially make a comparison between the cost of 101 and 77 for the purpose of trying to determine which was the more expensive of the two as a mode of construction? By the foot lineal; that is all.
4415. And you found, working it out in that way, that No. 77 was the more expensive? Yes, taking the capacities.
4416. Did you notice whether there had been any economy applied to construction in the case of 77 as compared with 101;—for instance, in reducing the size of the foundations, or in reducing the quantity of what might be called waste materials in the spandrils of the arches? No; I think 77 is a much more expensive design than 101.
4417. Can you explain what Mr. Hickson means, then, when he says that by the time the Department had arrived at No. 77 it had been found that the former plans were too heavy and expensive—that they were unnecessarily heavy and expensive—and that it had been found possible to economise in construction, partly by reducing the weight of the foundations, and partly by reducing the waste material in the haunches of the arches? No, I cannot. The sizes of the carriers are so different that it is hard to institute a comparison. One aqueduct is higher than the others.
4418. No. 77 is the higher? Yes.
4419. That would not affect the question of the arches and superstructure, it would only affect the piers and foundation? That is so.
4420. *Mr. Davis.*] Which would have the largest spandril, the arch as shown in the Government plan for Contract 77, or the segmental arch as shown in the case of 101? The arch in the case of 101 would have the largest spandril.
4421. *Mr. Parkes.*] Is not the building of an elliptical arch a great deal more costly than the building of a segmental arch? Yes; there is more trouble in getting the centres out.
4422. But is there not also more trouble in building after the centres are made? Yes; there is more trouble with the bricks.
4423. Is it not the most costly arch to build? Yes.
4424. *His Honor.*] I understand that the arches in the case of Contract 101 are segmental? Yes. [*Vide Appendices A. and C.*]
4425. And elliptical in the case of 77? Yes.
4426. *Mr. Parkes.*] Is there not more work and more material in the spandrils of the elliptical arches than in the spandrils of the segmental arches? There would be more material in the segmental arches, but I have not actually compared them.
4427. Take the striking of the arches on the piers in the segmental plan: compare the point at which the arch strikes there with the strike in the case of the elliptical plan? Yes; I confess I have not examined that point.

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4428. Is it not an acknowledged rule in construction that there is more work and more material in the spandril of an elliptical arch than in the spandrel of a segmental arch? There is more labour.  
 4429. Is there not more material? I do not know that there is more material.  
 4430. Take a semi-circular arch—is there not more material in the spandrel of the arch in that case? Yes.  
 4431. That is because the strike is lower? Yes.  
 4432. Would not the same rule therefore apply to an elliptical arch? The centre would strike lower.  
 4433. *Mr. Davis.*] In the case of 101, every sixth pier is an abutment pier twice the size of the rest? Yes.  
 4434. Go to Contract 77—are there any abutment piers? No.  
 4435. So that there would be a saving in abutment piers in design 77 as compared with the design of 101? Yes; but I have allowed extra to cover these.  
 4436. What is the span of the arch in the design of 101? 24 feet.  
 4437. What is the span in the case of No. 77? 52 ft. 3 in.  
 4438. So that there would be less piers in proportion in Contract 77 than in Contract 101? Yes.  
 4439. Taking the structure without regard to the material—taking it as it stands—do you not think that No. 77 is the cheaper design? Certainly; it is a lighter structure; but a more expensive one.  
 4440. *Mr. Parkes.*] But take it proportionately;—do not your own calculations show that there is more costly material in that design? Yes, proportionately.  
 4441. *Mr. Gummow.*] Taking the the brickwork in these three contracts, can you compare them at all in cost? No; the brickwork in No. 77 is more expensive than in the others. In the case of 101 the arches are simple brickwork, and in the case of 112 I do not think there is any brickwork at all, except under the carrier, and that would be much cheaper.  
 4442. It would be inferior brickwork? Yes.  
 4443. *Mr. Davis.*] Will the thickness of the arch have anything to do with the price? No.  
 4444. You mean to say that you could put in 4½-inch work in a tunnel for the same price as that at which you could build these big arches? Not for the same price.  
 4445. There is a lot of tunnel work in Contract 77;—there is a lot of 4½-inch brickwork in the tunnel, is there not? It is a small quantity compared with that in the aqueduct.  
 4446. But there would be a difference, and that would affect the price? 4½-inch work would be worth slightly more than 18-inch.  
 4447. *His Honor.*] The estimates you have handed in to-day go beyond the estimates you handed in on a former occasion? Yes; formerly my estimates went down to the footing line only.

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James Mitchell sworn and examined:—

- J. Mitchell.  
22 June, 1896.
4448. *Mr. Parkes.*] You are a clerk in the Department of Audit? Yes.  
 4449. You hand in two documents from the Department, showing what? Payments on account of the contracts of Carter, Gummow, & Co. and Carter & Co.  
 4450. For what period? From 1890 to 1895. [*Vide Appendix No. 23.*]  
 4451. Do these payments include payments in funded stock? That I could not say.  
 4452. Will you ascertain and let us know on Wednesday? Yes.

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Christian Herman Ohlfsen-Bagge recalled and further examined:—

- C. H. Ohlfsen-Bagge.  
22 June, 1896.
4453. *Mr. Parkes.*] You said the other day, in answer to one of my questions, that you informed Mr. Baltzer that Mr. Hickson wanted a Monier design;—did Mr. Hickson see you about it—did he speak to you about it? No, he did not.  
 4454. Who spoke to you about it? Am I bound to answer that question? I do not wish to cause any unpleasantness.  
 4455. I must ask you to tell us? I think it was Mr. Davis who spoke to me.  
 4456. What did he say to you? I think Mr. Hickson spoke to me also. I remember his saying, “Why do you not go in for more modern engineering?”  
 4457. I am referring now to the Monier arch design in Contract 77? Yes, but I think the conversation came in connection with the western outfall sewer in this way: I remember Mr. Hickson saying, “Why do you not go in for more modern engineering?” I said, “Well, Mr. Hickson, there are several modern modes of construction that have just come to light; but you must not forget that they are all specialities.” He answered, “That is all right; you get me some of the latest designs out; we must save all the money we can now. You had better get out three or four designs.” I think Mr. Davis afterwards came up and brought me a message to the effect that I was to get out a design for a Monier arch; and I then said to Mr. Baltzer, “Baltzer, Mr. Hickson wants a Monier design got out; you know all about it; now is your chance.” Baltzer said to me, “Yes, I know already; Mr. Hickson told me about it.”  
 4458-9. You said in your former evidence that you made calculations as to the strains on the arches at Johnstone’s Creek? Yes; no doubt, but only in connection with the original office design.  
 4460. When and where did you make up these strains? I remember at the time this matter of the western outfall sewer occurred saying to Baltzer, “If you make out a design on the Monier system you must make out calculations and show me that the system will be strong enough to hold itself up. I will not furnish Mr. Hickson with any design unless it is properly calculated.” I remember that we made out designs upon other systems also. I think there were four altogether. When Baltzer came to get out his calculations on the Monier system he found that he could not do it. I knew he would be unable to do it perfectly well, and he came to me and said, “Mr. Bagge, I find it exceedingly difficult to calculate these Monier arches. Will you let me have a good mathematician to help me?” I said, “You can have anyone you like.” He named a gentleman who is considered a good mathematician, and this gentleman went into the calculations with him. The mathematician afterwards came to me and said, “Mr. Baltzer can give me no starting-point, and unless I can get a proper starting-point I cannot calculate these arches.” He thereupon threw it up. Mr. Baltzer said to me afterwards, “Will you give me another good mathematician to help me?” I said, “You can have the whole office. Only prove that this thing will stand and I am satisfied. Show me your calculations.”

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calculations." I gave him another gentleman to help him, and that gentleman said to me, "Mr. Bagge, the key of the position is not in our possession. Mr. Baltzer has not got it. He is very anxious to get it, but he has not got it. We can only get at the result in a very roundabout way. We cannot calculate the Monier arch. We shall have to take the compo. arch by itself and give the iron in. We cannot arrive at the connection between the concrete and the iron. We have no data—no constant. We cannot arrive at it. The only thing you can do will be to make the compo. arch so thick that it will hold itself." We then altered the original design of the real Monier arch, and made it thicker to answer our calculations. I look upon the construction of a compo. arch of this kind, even of the thickness given, as a ticklish piece of business, and for certain very good reasons I feel very doubtful as to whether it will stand.

4461. Were these plans and calculations made in office time? Yes; all in office time.

4462. And they were afterwards handed over to the contractors? No; they were handed to Mr. Hickson with my report.

4463. Was the plan you made of the Monier design, and which you handed to Mr. Hickson, made in office hours? Yes.

4464. If Messrs. Carter, Gummow, & Co. had not the true calculations upon which the Monier patent was obtained, the patent would not hold good, I suppose, if it were challenged;—I presume you know something about patents? It strikes me that that is altogether a point of law of which I do not profess to have any special knowledge. This patent was taken out without my knowledge. I had no idea at the time that it had been taken out, but Mr. Hickson knew of it. I know that Mr. Baltzer consulted him about it. Had I known of the patent being taken out at that time, I would have opposed it if I could.

4465. You have often had to use iron in concrete and compo. in your construction? We have used in various works iron bond-rods. You know the hoop-iron also that is used in building. We have never used ironwork as it is used in this special system, although, of course, the system was known to us as far back as 1888.

4466. Did you make out plans of M'Sweeney's Contract No. 112? Yes. The arch in that case is not a Monier arch.

4467. In that plan you introduce iron into your carriers? Yes.

4468. Do you think that that design is as effectual as the Monier system? No, I do not think it would be quite as effectual as the Monier system. The metal would have to lie closer. The arch is stouter than in the Monier system, and we put the iron in to prevent the concrete from cracking.

4469. In that case you estimated that the material in the concrete, including the ironwork, would run £2 15s. a yard? Yes. [*Vide Appendices Nos. 21 and 12.*]

4470. That is a great deal less than the iron and compo., which was valued in the case of the Monier plan at £4 10s.? Yes, but that price was set down on the supposition that the material and workmanship would be of the quality required for Monier work.

4471. Would it not have been much more economical to adopt a design such as that which you adopted in M'Sweeney's contract when you were designing the Johnstone's Creek aqueduct? It is very difficult to say. Johnstone's Creek is surrounded by valuable properties, whereas the western outfall, M'Sweeney's Contract, is not, and here we wanted to hand in a variety of designs as Mr. Hickson had ordered. Each design we tried to make as cheaply as we possibly could, consistently with the strength required. We did not exactly compare the cost of one with the other until we had them finished; then we drew out our results. The Monier design you speak of might have been cheaper; but you must not forget that we did not feel very safe about the Monier system pure and simple. That is why we got out these other designs.

4472. But you feel perfectly safe in regard to the design in 112? We felt safer in regard to that design than in regard to the Monier system pure and simple.

4473. It is certainly cheaper? I think my estimates bear that out.

4474. Was the design of Contract 112 built up upon any of the schemes contained in your report to Mr. Hickson? Yes; upon No. 2 scheme.

4475. But according to your estimate the material would be cheaper in the case of the Monier arch design? The material in the Monier arch design we estimated much higher.

4476. Is the design in 112 just as effectual as the Monier system? We thought it would be just as effectual.

4477. As a matter of fact, it has more responsible work to do? Yes.

4478. You thought you could construct it more easily than the Monier design? Yes; we could have completed one arch at a time, provided the necessary number of rigid centerings were placed in position.

4479. *His Honor.*] You were designing a scheme in concrete arches with which you were quite satisfied, without the use of the iron in the arch at all? Yes.

4480. Your plan is very much heavier in construction than is the Monier, is it not? Yes.

4481. And when you did not know how to calculate the strains in the case of using the iron grill, you thought it better to trust to concrete only, and work upon the basis of a sufficiently strong concrete structure to satisfy all possibilities? Yes; the calculations upon which the Monier system was based were not obtainable in the Colony.

4482. That construction, in your opinion, would be equally effectual with the Monier design? We thought it would be.

4483. *Mr. Parkes.*] Do you recollect an experiment which was made with the Monier patent in the case of a bridge on the Parramatta Road? There was a culvert built there.

4484. The saving in that case was supposed to be about 50 per cent., was it not? All I know about it is this: Mr. Davis came to me one day and said, "Mr. Hickson is building a culvert on the Parramatta Road." Mr. Hickson had told me before that there were no special difficulties in the Monier system, and that anyone could carry it out. He afterwards tried it in the case of this culvert on the Parramatta Road, and that was the culvert which Mr. Davis asked me if I would like to see. He drove me out there, and we saw the culvert. Some little time ago I heard that it had collapsed. [*Vide Appendix No. 10.*]

4485. Have you seen it since? I did not see the collapsed culvert, but someone told me that it had collapsed.

4486. Who told you? Is it necessary to say?

4487. Certainly;—I want to know who told you? I think it was Mr. Davis who told me. Mr. Davis apparently denies having done so; but my memory is quite clear on this point.

4488. You are sure Mr. Davis told you? Yes; I am quite certain he told me that this culvert had collapsed.

4489. For what reason would it collapse? When I first saw it I thought it was a safe culvert, but when I saw the masons doing their work in the way in which they were doing it, I felt fairly convinced that the thing would tumble down. They did not put in the mortar properly.

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4490. If there is a saving of 50 per cent. resulting from the using of the Monier system in a bridge, would there not be a similar saving from the use of the system in an aqueduct? Where does the saving come in if the system tumbles down?
4491. The real patent is in the arch, is it not? Yes.
4492. Then I say that if there is a saving of 50 per cent. in the arch of a bridge would there not be a similar saving in the arch of an aqueduct? Yes. Perhaps you will allow me to reply to that question in my own way. The trouble of building upon this Monier system makes it very hard upon a contractor. In the first place there are a lot of centerings to be built and boxed in. For the Monier design of No. 3 Scheme, Western Outfall, I reported that ten centerings would be required at a time.
4493. If he does the work properly? Yes. If he does the work properly the boxing has to be made water-tight, and that, as you can understand, involves a great amount of trouble and labour. There is great risk attaching to the work, because when you are using this fine cement if the water runs out it would take the cement with it, and that would cause a weak point at once; therefore if the work is to be done honestly it must be done with water-tight boxing from one end of the work to the other, and there may be a great expense connected with that.
4494. Upon calculations of that sort you made up your cost to £4 10s? Yes. But whether we were quite right in our calculations is another matter. We made them as nearly as we possibly could.
4495. Supposing there was a saving in the arches of the bridge from the use of this system, there would also be a saving in the arches of an aqueduct, I suppose;—is there any reason why this should not be? I think it is very difficult to calculate on the saving upon this Monier system as it is being carried out. It is entirely an experiment, and it is very doubtful whether there will be any saving at all. That is my honest opinion.
4496. *His Honor.*] But supposing that the work does stand, and that it does not tumble down? Then of course there might be a saving.
4497. *Mr. Parkes.*] And that saving would apply to both the cases I have named? Yes.
4498. I think you said just now that you took out quantities of the original office plans while Mr. Baltzer was taking out quantities of the Monier plan;—is that what I understood you to say? Quantities were taken out in the office of all the three plans together.
4499. So far as extravagance of material is concerned;—which is the most costly, the office plan of No. 77 or the plan of No. 101? I think the plan of No. 101 is the more costly.
4500. Has it not most expensive material? It is a stouter structure.
4501. But there is no dressed stonework in it, is there? No.
4502. Is there not dressed stonework in the office plan of No. 77? Yes.
4503. And the very best class of faced brickwork? Yes.
4504. Look again at the plan of No. 101 and tell me which you think is the more extravagant in material? I do not call the plan of No. 101 an extravagant plan.
4505. What would you call the plan of No. 77? I should call neither extravagant. Each plan has been calculated on its own merits and has been given the strength and material it ought to have.
4506. When No. 77 was taken out was there an economy in any special sense as compared with No. 2 scheme in your report—in other words did you base your material and work in No. 77 on the material and work in No. 2 scheme? I think they were all taken out as cheaply as possible, each on its own merits.
4507. But when you were calculating the work and material in the Departmental design of No. 77 did you take No. 2 scheme in your report as a basis? No. That is a totally different design.
4508. Is it more expensive or more economical? The design of No. 77 would be the more expensive of the two.
4509. How long after the plans of No. 112 were the plans of the Departmental design of No. 77 drawn? The plans of No. 77 were drawn some time ago with Ashlar piers; in fact, more expensive than the present plan of No. 77, the latter is a modification of the original design, less expensive, and this modified design was prepared prior to, but signed by me in January, 1895, and Contract 112 was nearly finished at that time.
4510. Seeing that you went into calculations with a view to cheapening the aqueducts, why did you depart from the method of construction in Contract 112 when you were designing Contract No. 77? Because Mr. Hickson told us that we must do more modern and cheaper work for Contract 112. Contract 77 is in a prominent locality.
4511. But when you were making the plans for the succeeding Contract 77, including the aqueducts at Johnstone's Creek and White's Creek, why you did not adhere to the cheaper form of construction? Because the locality of Contract 77 required a different design from that of No. 112, for which Mr. Hickson wanted three or four different designs taken out. We had to take out three or four different designs in order to comply with Mr. Hickson's instructions. [*Vide Appendix B.*]
4512. Is the design in No. 77 one of these? No; the brick arches were done before. Mr. Hickson wanted a cheaper design than the brick arches for No. 112. He wanted larger spans so as to cheapen the design.
4513. You drew the plans of No. 77 after the plans for No. 112 were drawn? I think before Contract 112.
4514. Then what I want to know is why you did not adhere to the cheap form of construction which you had adopted in 112? The site for No. 77 required a different design. You must understand that for No. 112 we had to take out three or four designs on the latest principles. We could not ascertain the cost of a given work until the design had been completed sufficiently to permit of quantities being taken out. After the actual quantities of the different designs were taken out, it was a matter of chance whether one of them was cheaper than the other.
4515. You mean you were waiting for the results of the plan in No. 112? Yes.
4516. Then was the Departmental plan in Contract No. 77 an experimental design? No; it is not an experimental design. It is a design such as would be carried out in Europe at that time.
4517. *His Honor.*] Do you say that the design of No. 77 involves a saving upon the principle adopted in the design of No. 101;—was it a cheaper kind of construction? No. If we had constructed a plan in the case of No. 101 upon that principle, it would have been more expensive.
4518. Then was the plan in No. 77 cheaper than in No. 101? No. All the ornamentation was taken away in the case of No. 101. The work was nearer the town in the case of No. 77, and when we started these works we were told not to put ugly sewers across the valleys. I remember that a large and very influential deputation waited upon Mr. Bruce Smith in those days, and they especially asked that ugly sewers should not be taken across the valleys. I remember pointing out at the time that we had no intention of constructing ugly sewers, and that we could make the work look as nice as any other public work.
- 4519.

4519. *His Honor.*] It was a deputation of mayors and aldermen, I suppose? Yes, and of members of Parliament, and a considerable time afterwards when the work was being carried out Mr. Hickson said that we must save as much as we could by the use of more modern and cheaper designs. These designs were accordingly taken out. I wish your Honor to understand that even the concrete arches in Contract 112 are quite a novelty. They are a ticklish thing to construct. That kind of design is even now being spoken of in the Home papers as a novelty. They constructed in Austria lately a large concrete bridge on a similar design, and they looked upon it as a great novelty. I say it is a ticklish work, because you must have watertight boxes, and great care must be taken as regards the material. It is work which should be allowed to be done only by specialists, as done in European countries.

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4520. Then we come back to this—that as a mode of construction the design in Contract 77 is not cheaper than is the design in Contract 101? It is a totally different work.

4521. But whether the works are different or not, whether the difference comes in in the ornamentation or not, at any rate No. 77 is not a cheapening of the principle adopted in the case of No. 101. The design in No. 77 is in no way a cheapening of that principle? No. When we drew the modified present plan of No. 77 we took it out as cheaply as we could, but at the same time we wanted to give the work a good appearance.

4522. And did you in so carrying out your design modify the form of the arches—did you save anything in that plan of No. 77 in the arches as compared with the form of arch in No. 101? No, we did not; it might have been cheaper had it been a different style of work. At the same time the modified design for No. 77 is a very cheap design.

4523. If it were not for the ornamentation? Yes. [*Vide Appendices A and C.*]

4524. But with the ornamentation it is about the same you think? Yes, without the ornamentation it would be still cheaper.

4525. For its carrying capacity? Yes.

4526. *Mr. Davis.*] I should like you to be quite clear which design you signed first. You told us that the design of No. 77 was signed in January, and that the design of 112 was signed, as I understood you to say, later, in which case the design in Contract 77 would be in hand before the design in the case of Contract 112? Yes.

4527. Therefore the estimate that you put before Mr. Hickson when the design for No. 112 was about to be proceeded with had no reference to Contract 77? Certainly not, it only referred to No. 112. Every estimate was made entirely on its own merits. A special estimate for No. 77 was made and handed to Mr. Hickson at the time when that plan was laid before him.

4528. I should like you also to clear up the point as to the cheapness or otherwise of the design in contract No. 77 as compared with the design for Contract 101. Without reference to the material what do you think is the cheaper design? As far as the design is concerned the design for Contract 101 is the plainer and cheaper style of design.

4529. Leaving the material out of the question, and taking the big spans and the smaller piers in No. 77 as compared with the smaller spans and the big abutment piers in the plan of Contract 101, which would you say was the cheaper design? The plan of No. 77 might appear cheaper, but you must allow me to explain matters. You must recollect this, that when we designed the aqueducts for Contract No. 101 we were going over very peculiar and low ground, and by having the spans as you see them we distributed the weight of the heavy structure upon a greater number of piers and smaller arches in consequence. In the case of 77 we did not run as much risk as we did in the case of No. 101, which contract is on very bad ground. In the case of No. 101, on that low ground, we were afraid that with the larger arches settlement would take place much more readily than if the piers were closer together. As a rule, the greater the elevation of an aqueduct above the ground the greater the span of the arches.

4530. Assuming that the foundations were similar, and that the material in the two structures was similar, which would be the cheaper to build, the arches of the span which you have in No. 77 or the arches of the span which you have in No. 101? The two designs are necessarily quite different in style. I think the arches in No. 77, where practicable, would have been cheaper, but you must bear in mind that the two structures were on very different ground. It is of no use to ask me questions, irrespective of the ground for which the structures were designed.

4531. Coming now to the material. In the case of the design of Contract No. 77, I think you said that the material specified to be used in that case was more expensive than in the case of Contract No. 101? Only on account of the appearance which had to be given to the work.

4532. That was the reason for the difference you made in respect to the material in the design for Contract 77 as compared with design for Contract 101? Yes.

4533. Before we leave that subject, I should like you to explain what you meant by that foot-note to your report? The question arose as to the actual expense of these works. Mr. Hickson wanted us to do the work more cheaply. We had to consider that in the case of the one work two sewers would answer the purpose for a long time, the third being built some twelve or fifteen years hence. I, therefore, said in my footnote with reference to that work—I mean Contract 101—that Ahearne's plan was not so expensive as Mr. Hickson thought, and that if we only did the work actually required it would come to the amount I gave, leaving out the one sewer. [*Vide Appendix No. 9.*]

4534. You wanted to show first of all that the work which had been carried out in the case of No. 101 was not so extravagant after all? Yes.

4535. Secondly, that in the work you proposed to carry out in conformity with Mr. Hickson's wishes there was a saving representing the difference between £10 16s. 1d. and £6 16s. 11d.? Yes, and that for a much larger aqueduct.

4536. When you made these relative estimates what consideration did you give to the foundations. Did you assume that there would be the same foundations in each scheme? In these three schemes—certainly. They were all for one and the same thing.

4537. *His Honor.*] But did they involve the same foundations as in the case of Contract 101? Contract 101 was totally different from these three schemes. There were three different schemes for the same purpose, and they were on the same ground. Contract No. 101 is on quite different ground.

4538. *Mr. Davis.*] What you say is that you included in the three schemes you submitted the same foundations? Yes.

4539. How did the foundations which you included in No. 3 scheme compare with the foundations included in Contract 101? There is no relation between the two things.

4540.

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4540. So that it would not do to rely too much upon the comparison you made in your footnote? Not at all. I brought in the footnote to show that Contract 101 was not so much more expensive than the three estimates of the three rival schemes.
4541. What foundations did you include in the £10 16s. 1d.—did that amount include all the foundations which were put in or which were to be put in under Contract No. 101? According to contract schedule and prices.
4542. So that as far as the foundations are concerned the three schemes compare with the price in No. 101, £10 16s. 1d.? Yes.
4543. You were saying just now that the Monier design, which you now see on the easel, was made by Mr. Baltzer during office hours;—did you refer to the plan upon the easel, or did you refer to the design which was made at the time you wrote your report? The design referred to in my report was made by Mr. Baltzer in the office.
4544. Was it made during office hours? Yes, decidedly.
4545. You are quite sure about that? Yes; I am as sure as that I stand here that the plans were made in the office by Mr. Baltzer.
4546. Are you sure you have not confused the plan for the Johnstone's Creek aqueduct with the plan that was prepared in the case of No. 112 and which you submitted to Mr. Hickson with your report? I am referring to the plan mentioned in my report. Johnstone's Creek plan was also made by Mr. Baltzer, and I believe in the office.
4547. Do you mean the Monier design? Yes.
4548. Is it not a fact that the Monier design is similar in every respect to the design made by Mr. Baltzer at the time you submitted your report in connection with Contract 112? The plan you have pointed out to me is not a design for Contract 112. There does not appear to be any heading to the plan.
4549. I want you to be quite sure upon this point;—are you sure that this particular drawing was made by Mr. Baltzer during office hours? All I know is this, that Mr. Baltzer made a design for the Johnstone's Creek aqueduct, on the Monier system, and I believe in office hours. Whether the drawing before me is that identical drawing, or a copy of it, of course I cannot say.
4550. The design to which you refer was sent down to Mr. Hickson with your report? Yes.
4551. And that is the design to which you referred when you said, "Now, Baltzer, here is your chance"? Yes. I said to Baltzer, "Mr. Hickson wants three or four more designs, and he wants a Monier design. Here is your chance. You say you are an expert. Make a proper design, but be sure that it is calculated properly." [*Vide Appendix B.*]
4552. Is not the tracing before you, to which you have been referring, the plan which went down with your report to Mr. Hickson? It may, or may not, be; I cannot say. I should very much like to see the original.
4553. [*His Honor.*] When you sent down your report on the three schemes to Mr. Hickson you sent plans with it? Yes.
4554. [*Mr. Davis.*] But at that time the plan for the Johnstone's Creek aqueduct was not signed? I do not know about the date. I know that the Johnstone's Creek aqueduct plan, to which I am referring, was drawn by Mr. Baltzer, and I believe it was drawn in the office.
4555. But were these three concrete schemes made out with the idea of utilising them upon Johnstone's Creek and White's Creek;—were they not made out for another purpose? I recollect three different designs were made out at the one time, and that the Monier design was made out by Mr. Baltzer. The other designs were made out by us according to our ideas.
4556. Is not the tracing you have been referring to, and which Mr. Baltzer made, the design which was sent down to Mr. Hickson for his decision? I am under the impression that four designs were made out. There are only three here.
4557. Is not this tracing the drawing which you have referred to as having been made by Mr. Baltzer during office hours? Well, it is extremely difficult to distinguish one sheet from another.
4558. Was not the plan which Mr. Baltzer made during office hours the one which you sent down to Mr. Hickson with your report? Certainly.
4559. Did you, as far as you can remember, ever compare the cost of Contract 77 with the cost of Contract 112, Contract 77 being for the Johnstone's Creek aqueduct and Contract 112 being M'Sweeney's contract, seeing that these designs were made before Contract 112 was thought of;—how could you possibly compare the one with the other? The Johnstone's Creek aqueduct had nothing whatever to do with the three schemes contained in my report.
4560. What I want to know is, whether the Johnstone's Creek aqueduct plan had anything whatever to do with M'Sweeney's contract, taking the sewer across the sewage farm at Arncliffe? No; except that Mr. Hickson referred to it as a more extravagant work, and said that we must do cheaper work.
4561. When Mr. Hickson said that he did not refer to Contract 101? It is very difficult for me to understand what you mean. What I understood him to say was that the work referred to in my report must be done more cheaply with larger arches. I remember perfectly well what took place at the time, but your memory seems to have gone.
4562. At the time you submitted your report upon the extension of the sewer across the sewage farm at Arncliffe; you also submitted a sheet of strains? Yes.
4563. Can you identify the sheet I now hand in as being that sheet? Yes.
4564. Does it bear your signature? Yes.
4565. After this sheet had been prepared under your own superintendence, were you not satisfied that the 75-foot span arch at Arncliffe was not only stable but was absolutely sure? Yes; you are referring to M'Sweeney's contract. The calculations are quite correct, but the work is a speciality nevertheless.
4566. Did you not say in your report, "Scheme No. 3 is accompanied by one sheet of drawings showing the proposed general design, and by a second sheet of drawing showing diagrams of forces on the 75-foot span arches loaded and not loaded, and on the 7 ft. 3 in. arches loaded only." You go on to say that there is a factor of safety of 5·7, and that you regarded that as conclusive in your own mind as to the stability of the arch? I regarded the calculation as absolutely conclusive. It was the result of the best calculations we could make on the subject, but the work remains a speciality.
4567. Is it not a fact that the calculations shown on this diagram of forces were made without taking into consideration the iron grid in any way whatever? Exactly.
4568. You treated the arch simply as an ordinary arch composed of compo.? Yes. 4569.



4569. And it gave a factor of safety of 5·7? I ought to make this explanation: Originally we had made the arch lighter, but when we went into calculations we found that we could not make any in regard to ironwork; therefore, we made the arch sufficiently strong to hold itself. I warned you in my report that it was a concrete arch, pure and simple, and that both it and the Monier were specialities at home, and that the danger which rested with the one rested with the other. I warned you distinctly that it was a novelty, and I feel almost sure that if the iron were omitted from the compo., although the strain shows that the structure will stand, it would not be well to take the risk. I myself would not like to take the risk of the arch unless it were built by specialists. C. H. Ohlfsen-  
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4570. Then you regard this diagram of forces as unreliable? It is correct.
4571. Therefore, the arch should be stable if properly built? Yes; but I would not take the risk.
4572. With the iron grid it would be even more secure? Yes.
4573. Supposing you increased the thickness of the arch from 10 inches to 12 inches, would it not be even stronger? I would not build it of compo.
4574. But would it not be stronger? Yes.
4575. So that if the arch at Johnstone's Creek, which has not to carry the same weight as the arch which you propose at Arncliffe, is made 2 inches thicker, it will be 20 per cent. stronger; and you would say, therefore, that the design was safer than the one you proposed? I would simply say this—that according to calculation this plan is correct, but in practice I believe that if you carry out the work without the iron it will tumble down. There is no engineer here who can supervise it properly. It is a speciality, pure and simple.
4576. Do you remember when I told you, as you state, that the culvert had fallen down at Strathfield;—when was it? Some time afterwards. It might be a few weeks afterwards. You took me out to show me the place, and you afterwards said, "You know that culvert? It has tumbled down."
4577. You cannot remember where it was that I told you that? In the office.
4578. You are quite sure about that? I am as sure of it as that I stand here.
4579. Did I ever tell you, or did you ever hear from anyone, that a week after the arch of the culvert had been constructed, by some mistake on the part of the watchman, one of those waggons which come down from the country laden with produce and weighing about 10 tons was allowed to cross it, and that the arch did not move a peg? No; no one ever told me of that. It is the first time I have heard it.
4580. *Mr. Gummow.*] What is the date of your report to Mr. Hickson? 22nd September, 1894.
4581. What is the date of the acceptance of the tender for Contract 77? 13th March, 1895.
4582. With regard to this Parramatta Road culvert, you say it was badly constructed? I did not say anything of the kind.
4583. Did you not say something about bad construction? Mr. Davis, to the best of my recollection, came to me and said, "Mr. Hickson is building a culvert on the Parramatta Road. Would you like to see it?" I said, "Yes." We went out, and I saw it being constructed, and I saw the men who were at it using their tools in a very peculiar way, putting the compo. in in a way that I did not like—very different from the way in which I have seen you putting in the compo. in your model arch when it was built at North Shore. I saw then at once that it would never do to hand this kind of structure to anyone who came along, and offered to do it.
4584. Did Carter, Gummow, & Co. build the culvert? I do not think so. I think it was built under Mr. Hickson by one of the road engineers.
4585. If these Monier arches are built with watertight boxes, I understand you to say that you consider they would be all right—is that not so? That is one factor in their construction.
4586. With regard to the bad foundation in Contract 101, as compared with the bad foundation in Contract 77, which has the worse foundation? I think Contract 101.
4587. When you get a bad foundation, what means do you generally take to strengthen the structure? First of all, we make the arches narrower, and then we pile. Every pier is piled.
4588. Has any pier in the case of Contract 101 been piled—have piles been put in to support the piers? I think I made provision for piling in bad ground.
4589. If it were necessary? Yes.
4590. Have any piles been put into the foundations of Contract 77; and, if so, was any provision made for them? I could not say. The plan will show.
4591. Did you allow for piles in that contract? Yes.
4592. With regard to the three schemes upon which you reported—you say that Mr. Hickson told you that you must be more modern in the designs you got out;—you got out these schemes in order to be in touch with what was being done on the Continent? Yes.
4593. You said you considered these concrete arches a novelty? Yes.
4594. Do you consider the Monier arches a novelty? Yes; quite a novelty. A speciality.
4595. In connection with this contract for concrete arches, did you make any extra provision for security other than the usual deposit and retention money;—was there any guarantee bond? I could not say.
4596. You do not know whether the Government have made the contractors find security bonds as well as give retention money? I do not. I stated in my reports that for concrete arches as well as arches built upon the Monier system the European Governments asked for securities.
4597. You do not know whether the Government in this particular case asked for any special securities? No.
4598. I am referring to the design in Contract 112;—it is as much a novelty as the Monier system as far as you know? Yes.
4599. Do you know Mr. Snodgrass? Yes.
4600. Have you had much to do with him in general practical engineering? I have known Mr. Snodgrass for fifteen years, and I consider him a clever man; in fact, I think he is one of the cleverest men in your firm. I know you are a good man too, but I looked upon Mr. Snodgrass as a clever man, a good mathematician, and a man having at the same time a lot of practical experience.
4601. Do you know the main outfall chamber at Bondi? Yes.
4602. Would Mr. Snodgrass be quite capable of carrying out that work? I think so.
4603. Could I do it? I am sure you could. You did it.
4604. *Mr. Parkes.*] I should like to settle this question with regard to the plans. The first report you sent to Mr. Hickson was six or seven months before plans were made for the Johnstone's Creek and White's Creek aqueducts;—what I want to know is whether, when you were making plans for Contract 77, Mr. Baltzer was making a plan for the Monier arches? No; Mr. Baltzer made the plan for the Monier arches when we made the plans of the three rival schemes. 4605.



- C. H. Ohlfsen- 4605. You wrote a letter following your report, when tenders had come in for the Johnstone's Creek and  
 Bagge. White's Creek aqueducts, and then said: "The plans for the White's Creek and Johnstone's Creek aqueducts, as designed in this office, for which tenders were invited, were prepared with a view of securing the most substantial and enduring structure at the most reasonable cost. At the time that this design was made I had as full particulars regarding the Monier principle as it was possible to obtain in the Colony." Accompanying this letter or second report of yours, was the contractors' Monier design;—what I want to know is, was that contractors' Monier design made by Mr. Baltzer? Yes.
- 22 June, 1896. 4606. In the office? Yes, to the best of my belief. At least, I am under the impression that I saw him making a design there for this very thing.
4607. At that time? Yes.
4608. And were the original designs made at that time? Yes, the original design, as modified, was made in the office.
4609. The plan which Mr. Baltzer prepared would I suppose be a plan in addition to this tracing? Well, it was made on white paper like the plan before me.
4610. *Mr. Davis.*] Do you know whether Mr. Baltzer prepared two designs on the Monier system? It is very difficult for me to say, but I know that two designs were made. He made sketches first, and afterwards made the designs.
- 4610½. And that design was you say the design which you submitted to Mr. Hickson with your report? Exactly.
4611. When you submitted the tenders to Mr. Hickson in connection with Contract 77 you wrote what Mr. Parkes has read to you? Yes.
4612. You say in that report or letter, "At the time that this design was made I had as full particulars regarding the Monier principle as it was possible to obtain in the Colony"—did you refer to the design which you had submitted to Mr. Hickson before that date? The portion of the report which you have read referred to the design which Baltzer made in connection with the Johnstone's Creek aqueduct. I am sure of that.
4613. And you say he made only one design? That I cannot say, but two Monier designs were made in the office. I know that he made the design I asked him to make for the three rival schemes.
4614. It is quite clear that Mr. Baltzer drew the Monier arch plan which you submitted with your report on the 21st September, 1894? Yes.
4615. Now I want you to be very careful in what you say, because it is a serious matter. I want you to tell His Honor whether you know of Mr. Baltzer drawing any other design during office hours? He made several designs in the office. I am quite sure of that.
4616. Can you swear that Mr. Baltzer drew this design of the Johnstone's Creek and White's Creek aqueduct in the office? I would much rather that you did not ask me these questions. I have not seen the plans for a long time now, and they confuse me. I can only say to the best of my belief, Baltzer did draw the plan. I may be in error. The plan you have put before me looks to me uncommonly like the plan which I saw at that time. Now I come to think of it, I should not like to say whether that was done in the office or not. But I know two Monier designs were made in the office.
4617. *His Honor.*] You remember having a number of tenders laid before you in connection with the carrying out of Contract 77? Yes.
4618. You then made a report, or you may say you wrote a letter? Yes.
4619. A copy of that letter appears in the Parliamentary papers under date of 14th March, 1895? Yes.
4620. At the end of the list of tenders which you submitted with that letter you put the tender of Carter, Gummow, & Co., for a lump sum of £15,500? Yes.
4621. That was for carrying out the work upon the Monier principle? Yes.
4622. At that time did you see a plan or plans accompanying the tender for that particular work? I certainly did, and I know that a second design was made in the office.
4623. But the design to which you are now referring was for an aqueduct which really was to be built in a totally different place,—not at Johnstone's Creek or White's Creek? Yes, possibly.
4624. It might have been utilised for M'Sweeney's contract; but instead of utilising it for M'Sweeney's contract your No. 2 scheme was utilised? Yes, possibly.
4625. And it was as to the tracing to which you have referred that you calculated out the strains on the Monier system, leaving out the iron? Yes; the strain calculations refer to the three rival schemes.
4626. When this lump sum tender was before you for £15,500 as a substitute for the office scheme in the case of Contract 77, did you see any plan at all? Yes, I did. It came to me with the tenders for Contract No. 77, and at that time I was under the impression that it had been made in the office. It is Mr. Baltzer's drawing, but I may be in error as to his having prepared it in the office.
4627. That being so do you really know anything about the drawing of the plan;—do you know who drew it and where it was drawn? Yes, it is Mr. Baltzer's drawing; but, now I come to think of it, I should like to withdraw that part of my evidence as to where this plan was drawn, because I would not like to injure anyone. At the same time, I have a feeling that it was drawn in the office; but I do not want to injure anyone, so perhaps I had better not say anything definite about it.
4628. You are not sure about it? No; you must recollect that this took place some sixteen months ago.
4629. *Mr. Davis.*] At the time you received tenders for Contract 77 you had charge of the drawing office? Yes.
4630. You were personally acquainted with all that went on there? Yes.
4631. And you were responsible to the Government for seeing that every man there did his duty? Yes.
4632. Do you think it would be like yourself to allow a draftsman in the office to occupy his time on his private business or work? I do not look upon it in that light at all. When Mr. Hickson wanted a certain design we had to make it.
4633. You are referring to the design which you sent in with your report? Yes.
4634. I want you to fix your mind upon this—when you received tenders for Contract 77 is it likely that you would allow Mr. Baltzer or anyone else in the office to occupy his time in drawing another design? Not unless I told him to do so.
4635. You would not be likely to tell him? If I were instructed by Mr. Hickson that a design was wanted I should certainly tell him.
4636. Would he be likely to so instruct you;—is it at all likely that he would instruct you to do work for Carter, Gummow, & Co.? I could not take that into consideration at all. If Mr. Hickson wanted a certain design I should not ask anything of Carter, Gummow, & Co. I should not ask them to permit me to make the design. That has nothing to do with it.
- 4637.

4637. You say that Mr. Hickson asked you to make a design on the Monier system? Yes.
4638. Is not the tracing before you the design you made? Yes.
4639. *Mr. Parkes.*] When you submitted the tenders for Contract 77 did you write as follows to Mr. Hickson:—"With respect to Messrs. Carter, Gummow, & Co's. second tender for a lump sum of £15,500, I find that it is accompanied by a special design on the Monier system"? Then Carter, Gummow, & Co. must have given in the design with their tender.
4640. You admit that you wrote that? Yes.
4641. Do you not think that at that time you had the design before you? I have had it.
4642. But is it not probable that you would have had it? Yes.
4643. *Mr. Gummow.*] Did Mr. Hickson ever instruct you to allow any officer in your department to make a drawing for Carter, Gummow, & Co.? No.
4644. *Mr. Parkes.*] You recollect when you made your plans for Contract 77? Yes.
4645. Did Mr. Hickson then ask you to make a plan on the Monier system? No, I do not think he did.
4646. Have you ever seen the plan on white paper now before you;—I am not referring to the tracing? I have.
4647. Did you ever see it in the Government office? Yes; I think I may say I am sure I saw it there.
4648. Did you see it done there? That is another matter. You will see from my report, that I say as clearly as possible, that Carter, Gummow, & Co. sent in a special tender with a design accompanying it. They having done that as an unexpected thing to me I could not very well have given instructions for a drawing to be made in the office.
4649. But you say that Mr. Hickson came to you at that time and told you to get a design made out on the Monier system? Yes. But I think that referred to M'Sweeney's matter.
4650. But it must have been long before M'Sweeney's matter came up? The question is whether this Monier plan was made in the office at the time these plans for Contract 77 were being made there? I do not think so.
4651. When did you first have that plan before you? It is very difficult to say. Of course, if I had not seen it before I wrote the letter which has been referred to, it must have been sent to me with the tender. But that is the question. I cannot remember now.
4652. When are the office stamps generally put upon the drawings? When they go downstairs for record.
4653. Is not the stamp a record that the plan is made in the office? Yes.
4654. Is it put on after the plan is made? Yes.
4655. The stamp is evidence that the plan is an office plan? It does not exactly indicate that it is an office plan. If a contractor for instance sent in a plan with a tender it would be stamped in that way and recorded.
4656. Who was the draftsman who worked next to Mr. Baltzer in the office? Mr. Littlejohn.
4657. Are you quite sure now in your own mind about this plan having been made in the office? Well, I cannot be certain, but I am under the impression that it was. I may be mistaken.

C.H. Ohlfsen-  
Bagge.  
22 June, 1896.

WEDNESDAY, 24 JUNE, 1896.

James Mitchell recalled and further examined:—

4658. *Mr. Parkes.*] Since you were here on Monday you have looked carefully through the returns which you then handed in, showing the payments by the Treasury to the firms of Carter & Co. and Carter, Gummow, & Co.? Yes.
4659. Did you find that it included the whole of the payments—Funded Stock payments and all? Yes.
4660. *His Honor.*] The return is absolutely complete? Yes; I hand in also an additional statement showing the payments in Funded Stock as distinguished from the other payments. [*Vide Appendix No. 23.*]

J. Mitchell.  
24 June, 1896.

Joseph Davis recalled and further examined:—

4661. *Mr. Parkes.*] What is the position of the culvert upon the Monier arch principle which the Department constructed upon the Parramatta Road? I cannot say from memory, but I think I might be able to identify it from the map.
4662. Was the experiment made by the office;—do you know who carried it out? I believe it was made from the Road Vote. I do not know of the matter officially, but having taken some interest in it I happen to know how it arose. The local officer recommended that an ordinary culvert should be built there at a certain cost—a culvert to be covered with buckle-plates. Comparative estimates were made of the culvert as proposed by him, and of a culvert on the Monier system, and it was found that the Monier system was considerably cheaper than the ordinary construction. It was not regarded as an experiment in a certain way, and yet in another sense it was an experiment. [*Vide Appendix No. 10.*]
4663. Did you make any other experiment of the kind? There was no other experiment by the Department, if you regard that as an experiment.
4664. Did the Department make any particular tests of the strength of the Monier system? Yes; we have prepared Monier plates which have been tested both at the University and in our own testing room.
4665. *His Honor.*] Did Professor Warren test them? He has, I believe, tested two or three plates for us.
4666. *Mr. Parkes.*] At what time would that be? Probably fifteen months ago.
4667. Did you test them in any work in particular? Nowhere except in the culvert to which you have referred.
4668. Can the Monier work be seen in that culvert now? Yes. Perhaps I might say in order to set the matter at rest—because there was an element of doubt raised by Mr. Bagge's evidence on Monday—that since then an officer of the Department has been to this place, and having made a special examination of it has found that the work has not moved in any sense whatever—that it is precisely the same as when erected.
4669. Did anything ever happen to it? I think Mr. Bagge got his impression—and I can only call it an impression—that the culvert had collapsed in this way. During the time the culvert was being constructed a small quantity of compo. was one afternoon put in position, and during the succeeding night there was, for Strathfield, a heavy frost. This perished the compo. It would not set, and it had to be removed. My recollection is that Mr. Bagge saw the compo. being put into position, and did not like the way in which it was being put in. He did not think the work was being put together as it should be. My impression is that I told him of that particular bit of compo. having been removed again.

J. Davis.  
24 June, 1896.

4670.

- J. Davis. 4670. How far was the arch built when this accident took place? It was in the first portion of the arch, if I remember rightly. It was on the northern side of the road. Just a few feet were affected—3 or 4 feet perhaps.
- 24 June, 1896. 4671. You mean in the completed arch? Yes; the culvert arch was built in two lengths. The traffic was turned on to the northern side of the road, and the arch was built on the southern side for one-half the width of the street, and then when that had had time to set the traffic was turned over on to that length of the arch and the second length was constructed.
4672. Then it was the first length which did not stand? It did stand as I have already explained. The traffic was entirely turned off this particular piece of bad compo. which was perished by the frost, and as a matter of fact, it was of so little consequence as to be scarcely worth mentioning. The compo. damaged was very small in extent.
4673. *His Honor.*] Was it a whole layer all over the arch that went? Yes.
4674. Then what you mean is it was of very small thickness? Yes; the arch is only 4 inches thick, I think.
4675. Was it the first layer of all that perished? The arch was constructed as a whole—that is, they commenced to put the compo. into position from each skewback, and worked up to the crown. A length of the arch was finished in one operation.
4676. The work was done in sections? Yes; but one half the arch was absolutely finished, and the traffic was turned across it before the second half was proceeded with.
4677. The arch was built in longitudinal sections of less than half the width of the road? Yes.
4678. And it was one of these longitudinal sections that was perished? Yes; Mr. Bagge must have got that into his mind, I think. I am not at present positive as to the position of the culvert, but I can let you know when I see the papers.
4679. Who was the officer who went out lately to see the work? Mr. W. A. Smith. His office is at North Sydney.
4680. *Mr. Parkes.*] What was the total cost of the culvert? I suppose you mean the total cost of the arch, because the abutments of the arch were common to both designs. The filling in over the buckle-plates or arch made very little difference—in fact, no difference whatever. The total cost of the arch was £222 odd. The cost of the compo. itself including the iron work was slightly over £4 per cubic yard, for the arch alone.
4681. What would the cost of the original buckle-plate design be? My impression is that £100 was saved in the culvert by the adoption of the Monier plan.
4682. *His Honor.*] As compared with buckle-plates on iron girders? The buckle-plates rested on the walls, but they had to be joined with bulb iron, so that the bulb iron acted as a girder.
4683. *Mr. Parkes.*] What was the thickness of the plates? The usual thickness. They are in parts, 3-16ths, 1-4th, and so on.
4684. And what was the length? They vary in size. Some are 4 ft. 6 in. square; some are 4 feet by 5 feet.
4685. And on the top of these would be put the concrete? Not the concrete. I think it was usual to put tarred metal on them.
4686. Were the abutments of stone or brick? The abutments were proposed to be of stone, but the abutments of the Monier structure were concrete.
4687. The abutments in the buckle-plate design were of stone? Yes; in the original proposal.
4688. And they were altered to brick in the Monier design? They were put in as concrete for the Monier structure.
4689. Did you carry out any other experiment in connection with this arch in any other locality? Not as far as the Department is concerned. Carter, Gummow, & Co. carried out an experiment at North Shore some two years ago.
4690. Where was that? In Alfred-street, near the tramway.
4691. Was that a culvert? No; it was an arch with a 30-foot span.
4692. Is it in existence now? No; it was broken up.
4693. Do you mean afterwards? I mean by the test. A uniform load was first put on, and it stood all right. We then put a load on one side, and that broke it up. It stood a good test.
4694. You say that when an unequal load was put on the arch broke up? Yes; when the ultimate load was put on.
4695. *His Honor.*] You mean that you went on testing the arch till you tested it to death as it were? Until we broke it. That is the usual way in which tests are made.
4696. You altered the nature of the test, and applied it to one particular part of the arch? Yes; we put it on one side of the arch, so that it would correspond more to a rolling load.
4697. *Mr. Parkes.*] Were not compo. arches tried by the Railway Department at North Shore when constructing the railway there? Not to my knowledge. I know that some of the railway officials were present at the test to which I have referred, and I know also that the railway was being constructed at the time.
4698. Do you not know that compo. arches, which were supposed to be put on the railway, were afterwards changed into brick? I am not aware of that.
4699. You never heard of that? No.
4700. Do you remember the thickness of the arch? In the case of the culvert I think it was 4 inches at the crown. I did not come here to-day prepared to be examined on these points, but I can obtain the fullest information later on, so that there may not be the least element of doubt.
4701. *Mr. Gummow.*] With regard to the buckle-plates, you say that the Monier arch was substituted for the buckle-plates? I did not say that precisely. I said that the local officer had proposed an ordinary structure, which is usually composed of stone walls and buckle-plates, and that the Monier system was substituted for it.
4702. Can you tell me the life of a buckle-plate? I estimate that it would probably be twenty-five years; but it would depend very much upon the treatment it received and the position in which it was put. If, for instance, it were exposed to salt air, it would cut away sooner than it otherwise would.
4703. I suppose sewage gas would affect it? Most decidedly.
4704. Did you put buckle-plates in some work at Wentworth Park some years ago? Yes.
4705. Are they now as good as ever? I have not examined them since they were put in, but they must have deteriorated to some extent.

4706. With regard to the test of the arch at North Sydney, do you know the reason of its breaking? Through its being loaded at one side. J. Davis.
4707. Do you know whether the cause of the breakage lay in the arch being too weak? No; the abutments moved. 24 June, 1896.
4708. In other words, it was the arch which was being tested, but the abutments proved to be too weak? Yes; they slid.
4709. It was not the arch itself that broke? No; the arch itself would have stood more had the abutments remained in position.
4710. Is it not the case that the abutments and not the arch gave? The abutments gave first.
4711. *His Honor.*] What you mean is that the abutments gave, and therefore the arch gave? Yes.
4712. *Mr. Gummow.*] It was not the weakness of the arch which caused the collapse? No. Had the arch been constructed between proper abutments no doubt it would have stood considerably more.
4713. You say that you put a uniform weight all over it and that it stood the test, and that you then put on a side-load? Yes.
4714. Can you tell me whether the arch was designed for a side-load or not? It was not. It was designed for a uniform load. If it had had a Monier grid on the extrados as it had on the intrados it would have stood the side-load all right.
4715. You had the side loaded up because the arch would not break with a uniform load? Yes.
4716. So as to give the gentlemen present a good idea of what might happen? Yes. It was thought that as a road bridge would be subject to that sort of thing it was desirable to test the arch in that way.
4717. Is it fair to test a bridge designed for a certain load with another load;—if you are designing a bridge, do you not know the strains to be put on it? Yes. You must do so before you can make a proper design.
4718. Then if this particular arch were built merely for a uniform load, would it be fair play to the design to test it with a side-load? No.
4719. What was the span of the arch? Thirty feet, I believe. It was 4 inches in thickness, I think, at the crown, and 6 inches at the springing. That is my impression, but the test was made so long ago that I have forgotten details.
4720. *Mr. Parkes.*] What was the weight of the load? I cannot tell you now, but I can get you the information later on.
4721. *His Honor.*] How and where was this arch built? It was built in the contractors' yard at North Shore.
4722. Were the spandrils of the arch filled in? No. There were two abutments built up to the level of the skew-backs, and the arch was built in between. What happened afterwards was that the abutments slid.
4723. Did the abutment on the side upon which the load was put give, or did the abutment on the opposite side give? The abutment on the other side gave.
4724. And then the arch buckled? Yes.
4725. If the extrados had been stiffened by a grid it would have held? That is the way in which they are constructed for road bridges, so that when the load approaches the bridge the iron near the opposite abutment is put into tension on the upper side of the arch and into compression on the lower side. The opposite happens when the load gets on to the other side of the bridge.
4726. With an even load, such as a load of water, the compression is almost always in a vertical line? Yes.
4727. And therefore you do not want the upper grid? No.

George Scott Chiene sworn and examined:—

4728. *Mr. Parkes.*] You are an engineer? Yes.
4729. What are your qualifications? I am a licensed surveyor. G. S. Chiene.
4730. In 1891 where were you employed? At the Town Hall. 24 June, 1896.
4731. Had you permanent occupation there? Yes; at least Mr. Richards told me so.
4732. Will you tell His Honor why you left the Town Hall? Mr. Carter asked me to engineer three sewers, viz., at the Glebe, at Waverley, and at Shea's Creek.
4733. Can you give us the whole of the conversation you had with him? They asked me how I stood at the Town Hall, and I said that I was getting £5 a week. They asked me if I was in permanent employment there, and I said I did not know. They said they would give me £6 a week if I came to them. I asked them to give me a few days to consider the matter, and I said that I would let them know. I afterwards wrote and told them that I would accept their offer. I received a verbal message in answer to my letter to the effect that I was to see them at St. John's Road.
4734. What arrangement did you make with them? Mr. Carter told me that I would be my own master, and that if they kept on with the contracts it would lead to a permanency. They said that if they had any luck they would give me a bonus.
4735. What was the date upon which Mr. Carter paid you off? I think it was in the first week of April, 1893.
4736. What was the reason of your leaving the firm? Mr. Carter told me that they had no work for me.
4737. Did you receive a testimonial from Mr. Carter at that date? I received a letter from him on the 17th March, 1893.
4738. It was in these terms, I believe:—"The bearer, Mr. Chiene, has been employed by us during the last three years as engineer on our various contracts in connection with the Sydney underground sewerage system. His connection with our firm has ceased solely through the stoppage of public works in this Colony. To anyone desiring a thoroughly competent and trustworthy man we confidently recommend him, and shall be very pleased to give any personal reference that may be required. The class of work Mr. Chiene has done for us requires the greatest care and thorough knowledge of engineering, both practical and theoretical?" Yes, that is the testimonial.
4739. Therefore you were not sent away by the firm on account of any lack of qualification, but simply because the work had ceased? Yes.
4740. You know of no other reason for severing your connection with the firm? There was none that I know of.

- G. S. Chiene. 4741. You have had a varied experience upon contracting work as it is carried out by expert firms? Yes.  
 4742. Will you tell His Honor what you saw occurring in connection with the contracts of this particular firm? I never saw a gauge fairly measured anywhere.  
 24 June, 1896. 4743. Of what contract are you speaking? Not of any contract in particular.  
 4744. You are referring to the concrete guage? Yes.  
 4745. In what way was it unfair? The blue metal and sand were always heaped up, and in plastering the cement was short in quantity.  
 4746. Do you remember being on one particular occasion at the office of St. John's Road at the Glebe? Yes; I saw Mr. Carter there several times.  
 4747. Do you remember his being there on one particular occasion when he left something? Yes; I remember a spirit-stand being left there. It was brought up in a parcel, and a message was left that if a man came from Mr. O'Hanlan the parcel was to be delivered to him.  
 4748. Who was Mr. O'Hanlan? One of the Government engineers.  
 4749. What occurred after that? I told Jack Reid, the contractor's manager, of the message.  
 4750. What occurred after that? Reid tore the parcel open and looked at it. When he saw what it contained he said "I do not begrudge him it because he has done the firm some service at North Shore."  
 4751. Upon what contract would that be? I do not know.  
 4752. Did you see and hear this? I did.  
 4753. You saw what the parcel contained? Yes.  
 4754. What was it? A spirit-stand with three cut bottles in an oak frame.  
 4755. On one occasion you had a conversation with Jack Reid, the manager for Messrs. Carter & Co. in the office? Yes; in the Glebe office.  
 4756. What occurred there? Reid told me that many of the inspectors were being paid by the firm. I refused to believe it, and he took me down one of the paysheets and showed me the names.  
 4757. What names did you notice? The name he particularly showed me was Inspector Corpe. It appeared from the paysheets that he had received £1.  
 4758. Did Reid also tell you anything about a man named Goddard? Yes. I may say that if Reid had not called my attention to these things I should not have known about them.  
 4759. *His Honor.*] All that you know is from what Reid told you? Yes.  
 4760. *Mr. Parkes.*] What did Reid tell you about Goddard? He told me that Goddard had gone down and had marked all the places where they had put in shale between Nos. 12 and 13 shafts.  
 4761. What was the sewer cased with? It was supposed to be cased with concrete, and the shale and muck was going in to fill up the holes before the concrete went in.  
 4762. What occurred after that? Mr. Carter came to the office.  
 4763. You were there at the time? Yes; Reid nodded to me when we got outside, and he said, "We had better clear, as Carter wants to square with Goddard."  
 4764. Did Goddard come to the office? Yes; he was in the yard when we went out.  
 4765. Did he go into the office with Mr. Carter? He went to the door.  
 4766. But did he go in? I did not see him go in.  
 4767. What became of Goddard after that? He went to Melbourne or to Broken Hill.  
 4768. Where is he now, do you know? I heard that he was keeping a public-house at Broken Hill.  
 4769. When did he leave the job? Almost immediately afterwards. He did no more work on the job that I know of.  
 4770. Where were shafts Nos. 12 and 13 located? No. 12 is in St. John's Road, just above the Congregational Church, and No. 13 is in a lane at the back of the Congregational Church.  
 4771. Is that sewer connected yet? I believe so, but cannot say for certain.  
 4772. *His Honor.*] What is the number of the contract? No. 65.  
 4773. *Mr. Parkes.*] What was meant by Reid when he referred to Goddard marking certain places? I took him to mean the places where they were putting in shale to fill up the holes.  
 4774. You know a man named Martin Byrnes? Yes.  
 4775. You were present at the head of shaft No. 12 when a conversation took place between the contractor's manager, Reid, and Martin Byrnes? Yes.  
 4776. What was it? Reid told Byrnes to get the mullock put in as soon as possible.  
 4777. What was Byrnes's reply? He said that if he were caught he would be hanged for it, and he added, "All right, I will be hanged for it. You clear out and keep the Inspector away."  
 4778. Manager Reid frequently boasted to you about his trying to do the Inspectors, did he not? Frequently.  
 4779. Did he not give you an illustration on one occasion? Yes; he told me that Gledhill had told him not to fill up No. 9 shaft at the head of Mitchell Road till he was present, and Reid said he had got the men to do it at 5:30 in the morning, before Gledhill came.  
 4779½. What shaft was that? No. 9 shaft.  
 4780. On the same job? Yes.  
 4781. Did Mr. Snodgrass ever have any conversation with you? Sometimes.  
 4782. What did he ask you to do on one occasion with Corpe? He asked me to make out a calculation as to the number of batches of concrete that ought to go in.  
 4783. Was there anything further? He told me what to do, and I did it.  
 4784. What was the calculation on? It was a simple return of what ought to go in according to the cross-sections.  
 4785. *His Honor.*] In some particular length of sewer do you mean? Yes.  
 4786. In what length? I could not tell you now.  
 4787. *Mr. Parkes.*] Do you know a man named Harry Labrees? Yes.  
 4788. He had a conversation with you, I believe? Yes.  
 4789. He complained that the Inspector was too strict with him? Yes.  
 4790. What happened? He was told to be careful for a few days, as there was a suspicion on the part of the Department.  
 4791. Who told him? Mr. Snodgrass told him.  
 4792. What else did he say? He said he would rather lose £50 than be caught.  
 4793. Did not Reid on one occasion show you a cask of cement in one of the offices? Yes; he drew my attention to a cask of cement which was kept in stock.  
 4794.

4794. What for? From which to send in tests for any consignment of cement which might come in. G. S. Chiens.
4795. That is to say, when any tests had to be made this one cask was made to stand for the lot? Yes.
4796. Do you know of your own knowledge that that was so? Well, he showed me the cask, and he told me that he was going to plant it for further use. 24 June, 1896.
4797. Of course, as engineer, you had to watch the concrete going in? As engineer I was never asked to do that.
4798. But you say that you saw it? As I was passing different shafts I saw it.
4799. What class of concrete was it? Pretty fair, as a general rule.
4800. You said first of all that gauge was overloaded? Well, the blue metal or the white metal and the sand were always heaped up, and then a cask of cement would be put in. In other instances the proper quantity of sand would be put in, and there would be less cement.
4801. Did you see the gauging? Not always.
4802. *His Honor.*] What was the practice as to the cement; was it gauged as a regular thing;—or would a certain number of casks of cement be used as representing a certain bulk? The cask is generally put in holus-bolus.
4803. But is it the practice to gauge the cement in the gauge-box, or to treat so many casks of cement as representing (say) a cubic yard? In concrete a cask of cement is used as representing 4 cubic feet.
4804. So that the practice would not be to put the cement out of the cask into the gauge-box? Not in the case of concrete, but that is done for rendering.
4805. Is there not a method of gauging the sand, metal, and cement, in the mass for sewer packing? A gauge-box is made for the blue or white metal and a gauge-box for the sand, and the cask of cement would represent 4 cubic feet.
4806. I understood you to say just now that the blue or white metal would be heaped up, and that the sand also would be heaped up in the gauge-box, and that then the cask of cement would be put in? Yes.
4807. I want to know what you mean by that? The box is supposed to contain 16 feet of blue metal. The metal is measured in it in the way I describe, and is put on to the board. The sand is then measured and put on, and finally the cask of cement is added.
4808. You mean that one cask of cement would be the proper amount if the other materials were not heaped up in the gauge-box? Yes.
4809. What you complain of is the heaping up of the metal in the gauge-box? Yes.
4810. *Mr. Parkes.*] In all cases, I suppose, the master contractor cannot be responsible for his men? I do not say that he is.
4811. Men on these jobs often endeavour to help the master contractor out of kindness? Yes.
4812. That has been the practice always? Yes; a number of these acts are done without the masters knowing anything at all about them.
4813. But that could be stopped, could it not, if the work were properly supervised by inspectors? A great deal of it could.
4814. That would be a very simple matter if the inspectors did their duty properly? Yes.
4815. Even on the part of the inspectors, I suppose you would describe what is done as being more in the nature of carelessness than wrong-doing? Yes.
4816. But if the work were properly supervised there can be no doubt about this—that the bad work would not go in? Not one-half as much as it does.
4817. Are you confident, in your own mind, that bad work was going on on the contracts on which you were engaged? Yes.
4818. You are perfectly certain of that? Yes; absolutely certain.
4819. *Mr. Smith.*] You say that you are confident that on these contracts there was some bad work? Yes.
4820. Of what contracts are you now speaking? I am speaking of the works at the Glebe and at Waverley.
4821. You cannot identify the number of the contracts? No.
4822. How long were you on the Glebe contract? Twelve months, with the exception of six weeks.
4823. Did you go there direct when you left the Town Hall in 1891? Yes.
4824. When did you leave the Glebe? On 27th February. Mr. Carter asked me to go and see Parry and Farley on the 29th. I called on Mr. Farley at Mr. Carter's request.
4825. You then went to engineer Parry and Farley's job at Darling Point? Yes.
4826. You were on the Glebe contract from early in 1891 until February, 1892, is that it? Yes.
4827. When, then, did you go on to the Waverley job? At different times during the same period—that is from 1891 to 1892.
4828. Who was the engineer on the Glebe contract? Mr. Rudolph.
4829. Who is Mr. O'Hanlan? He is a Government engineer.
4830. Was he over Mr. Rudolph? No; he had nothing whatever to do with the job.
4831. Do you know Mr. O'Hanlan? When he came there I was introduced to him, but I had never seen him before.
4832. He had nothing whatever to do with this contract? Not that I know of.
4833. Did you hear that at that time Mr. O'Hanlan was about to be married? Yes.
4834. Just about the time that this little present arrived for him? Yes.
4835. You are sure you heard that? Yes.
4836. As to the inspectors you have referred to—I suppose you mean the Government Inspectors on the work? Yes.
4837. Who were they? Jack Brown, Gledhill, Dick Eyre, Corpe, and Norby. These are the only ones I know of.
4838. Who had charge of the concrete work;—who was the inspector who was overlooking that? Gledhill and Eyre, I believe.
4839. I suppose you know the men who were working on the contract? Most of them.
4840. Who were the men who were doing the bad work—what are their names? Martin Byrnes was one.
4841. Who were the men you saw doing the work? I never saw any. I never interfered with the work at all.
4842. You never actually saw any of the men doing bad work? I do not think I did.
4843. Martin Byrnes was the man who was told to do it? Yes.

- G. S. Chienc. 4844. Is there any other reason you have for saying that bad work was done there beyond your hearing Byrnes being told to do it; you say you never saw anyone doing it? I never even tried to look.
- 24 June, 1896. 4845. What makes you think then that bad work was being done? Because Jack Reid was everlastingly talking to me about it.
4846. Did he say that the men were doing bad work? Over and over again.
4847. He told you so? Most distinctly.
4848. Did he specify the nature of the bad work? Sometimes.
4849. *His Honor.*] Jack Reid was discovered to have a conscience—is that what you mean us to understand? I am only telling you the truth as he told it to me.
4850. But in what tone, in what manner did he tell you;—with what object? Generally in a boasting one.
4851. *Mr. Smith.*] Did he seem to be proud of it? Yes.
4852. Did he say anything about the inspectors? Yes; he told me that Mr. Carter paid some of the Inspectors.
4853. Did he mention the names of the inspectors who had been paid? Yes.
4854. Who were the inspectors who were said by him to have been paid? Dick Eyre was one of the persons mentioned. I refused to believe it, but he took down the pay-sheets and showed me.
4855. Jack Reid told you that Mr. Carter had told him that he had squared Eyre, is that it? No; but every now and again Jack Reid said that Eyre wanted to see Mr. Carter. I asked him what for, and he said, "Carter is as good as 30s. a week to him."
4856. But did he ever tell you that Mr. Carter paid Eyre anything? Not beyond what I tell you. When I refused to believe him he took down the pay-sheets and showed me the name.
4857. Eyre was one of the sub-inspectors, I believe? Yes.
4858. Had he anything to do with the concrete? He was watching the gauging on the top.
4859. Did you ever see Eyre at all? Frequently.
4860. You did not see any of this bad work being done when he was there? I never saw any of the bad work being actually done.
4861. Was this Mr. Jack Reid, the contractors' manager, in charge of the whole of the job? Yes; so far as I know he was.
4862. *His Honor.*] Was he in charge of more than that contract? No; he was in charge of the Glebe job.
4863. *Mr. Smith.*] Who is the man Goddard you mentioned? He is one of the miners.
4864. Employed by the contractors? Yes.
4865. Was he also on the Glebe job? Yes.
4866. What had he to do with the concrete packing? Jack Reid told me that he suspected that they were doing bad work, and he went into the tunnel and marked the places where the bad work was going on.
4867. Who went in? Goddard.
4868. Have you seen him since he left the job? I have not. I am told that he is keeping a public-house at Broken Hill.
4869. So that this bad work which you say existed upon Contract 65 you can only speak of from what you have heard from the persons you have mentioned? That is all.
4870. You left the employ of Messrs. Carter, Gummow, & Co. in April, 1893? Yes.
4871. When did you first mention this bad work to any one? I have spoken of it to miners and others at different times.
4872. But when did you first mention it? I dare say on the Glebe job.
4873. But since you left, I mean? I think at the commencement of this month.
4874. That was the first time you mentioned it since you left the firm? No; that was the first time I mentioned it to Mr. Parkes. I have spoken of it at different times in the interval to contractors, to miners, and others.
4875. Since you left the employment of the firm? Yes.
4876. You mentioned it to Mr. Parkes you say? Yes; I had a letter from Mr. Parkes, in which he asked me to call upon him. Otherwise I should not have gone near him.
4877. You called on him and made a statement? Yes.
4878. What have you been doing since you were last employed upon these contracts? Several times I have been idle from month to month.
4879. What are you doing just now? Nothing just now.
4880. With regard to the testing of the cement, do you know how that is done on a job of this kind? I have not been present in the Government offices when the cement has been tested.
4881. So that you do not know how it is done? No.
4882. You do not know in fact whether one cask is not taken out of every fifty by way of testing? At any time they had to send in a test the cask would be produced, the inspector would take what he wanted, and he would then mark the cask.
4883. You do not know how many he would test out of every hundred? I do not know.
4884. As to this particular cask, which was planted for the purpose of testing, did the inspector go to it, do you know? It was taken to the inspector.
4885. The inspector, then, would test only the cask brought to him? He would take out a sample in a tin and send it to the office. He has to send in a certain quantity of cement to be tested.
4886. From which cask would he select the cement? From the cask given to him.
4887. He would not select the cask himself? If he liked he could do so.
4888. But you say that he did not? I suppose not. If my attention had not been drawn to these matters by Reid I should not have known anything about them.
4889. In this instance you say the inspector took only the cask which was brought to him for testing purposes? Yes.
4890. How often do you know of that being done? It was done only once that I know of.
4891. Who is the inspector who took the cement for testing? Gledhill, I think, but I would not be certain.
4892. Just think again? Gledhill's name strikes me as being the right one. It was Reid who drew my attention to the matter.
- 4893.



4893. But do you know for certain who the inspector was? To the best of my belief it was Giedhill. G. S. Chiene:
4894. Who were the other inspectors who had to do with the concrete? The test I have referred to was the only test I ever saw sent in. 24 June, 1896.
4895. Who was over the inspector who had to do with the test? No one that I know of.
4896. So that it must have been the man you have mentioned? I think it is very likely.
4897. *Mr. Gummow.*] You say that you were engaged at the Town Hall? Yes.
4898. Had you permanent or only temporary occupation there? At the time it was only temporary, but when Mr. Carter came to me I spoke to Mr. Richards, and he said that as far as he was concerned my employment there might last seven or eight years.
4899. Did he know how long it would last? No.
4900. Then it was only temporary occupation at that time? Just so.
4901. How long were you with our firm? Two years.
4902. Had you an engagement with the firm? Yes.
4903. Did you stay with the firm for the two years? I would have done so if Mr. Carter had not asked me to go to Darling Point. He paid me the balance of about six weeks after I left Parry and Farley.
4904. Parry and Farley did not pay you? Well, Mr. Carter said, "If Parry and Farley do not pay you I shall."
4905. What I want to know is who paid you for the two years? I was with Messrs. Carter, Cummow, & Co. for the one year, and with Messrs. Parry and Farley for the other.
4906. Did not Messrs. Carter, Gummow, & Co. find you employment with Messrs. Parry and Farley? Yes.
4907. With reference to the delivery of the spirit-stand of which you have spoken, do you know if it was delivered to Mr. O'Hanlon? To Mr. O'Hanlon's man.
4908. You are certain of that? Yes.
4909. Do you know the object of the gift? It was given as a wedding gift, I believe.
4910. Is not such a gift usual between friends when one of them is about to get married? Yes. So far as I am concerned I would not care if the gift had been £1,000; I am only alluding to it because Jack Reid said he thought O'Hanlon deserved it.
4911. What impression do you wish to leave from our reference to the subject? Simply that a person was being bribed.
4912. Do you not know that it is a rule among friends to give one another wedding presents? Most decidedly.
4913. Was Mr. O'Hanlon connected with this work at all? Not at all.
4914. Has he been connected with any of Carter, Gummow, & Co.'s works, do you know? Not that I know of.
4915. Did not Mr. Carter visit Mr. O'Hanlon's house as a private friend? As far as I know he may have done so.
4916. Do you know if any other member of the firm did so? Yes, Mr. Snodgrass did.
4917. As far as you know, Mr. Carter and Mr. O'Hanlon were personal friends outside of their work? As far as I know.
4918. That being so, does it seem strange to you now that Mr. Carter should have left a spirit-stand for Mr. O'Hanlon purely as a matter of friendship? Not at all. I should not have thought anything of the matter but for Reid making the remark he did.
4919. Did you look upon the gift as a bribe? I did.
4920. With regard to Corpe, where is he now? I was told the other day that he is dead.
4921. You say that you saw on one of the pay-sheets the amount of £1 for Corpe? Yes.
4922. Do you know what happened to him? No.
4923. You do not know for certain that he is dead? Joe Husband and Eyre told me the other day that he was dead. I knew that he had consumption.
4924. Do you know that Mr. Carter gave him other money? I do not.
4925. Do you know that Mr. Carter paid his funeral expenses? No.
4926. But if you heard of such a thing, would you believe it? Yes.
4927. You think that Mr. Carter is pretty liberal to people as a rule? Undoubtedly.
4928. Do you now say that you consider the amount of £1 to be a bribe to Corpe? I looked upon it in that light.
4929. Would you consider the payment of his funeral expenses in the nature of a bribe? I knew nothing about that till you mentioned it.
4930. But you would not regard it as a bribe? No.
4931. But if he would do the one thing he would be likely to do the other. If he gave the man £1 he might be afterwards induced to pay his funeral expenses from some improper motive;—do you really see any difference between the two cases? I do not know anything about it. If Reid had not mentioned the matter to me—if he had not suggested that the money had been given as a bribe—if he had not said that the man deserved it—I should not have known anything about it.
4932. It was that which made you think it was a bribe? My opinion is that it was a bribe because he told me so.
4933. At all events you do not regard the payment of his funeral expenses as a bribe? Certainly not.
4934. As to Goddard, you say that Reid told you that he was going to be squared by Mr. Carter? He did.
4935. What was the subject upon which he was to be squared? Did you know that Goddard had summoned Carter, Gummow, & Co? I do not know.
4936. You do not know that Goddard came there for wages which were due. You do not know anything about the matter of your own knowledge? No.
4937. If you were told that Goddard had summoned Carter, Gummow, & Co. for wages would you believe it? Certainly I would.
4938. Do you know whether, as a matter of fact, Goddard went down to be squared for a sum of money due as wages? I do not.
4939. As to this conversation between Martin Byrnes and Reid, when Byrnes said "that he would be hanged if the inspector were not kept out of the way," do you know whether he did bad work? I believe he did, but I did not see it.
4940. Did he do it? I could not tell you. 4941.

- G. S. Chiene. 4941. You say that Harry Labrees said that inspector was too severe? Yes.
4942. Is that an unusual thing for contractors' men to say? It is the first time I heard it.
- 24 June, 1896. 4943. Did you ever hear of contractors' men leaving because inspectors were too severe? Connors, the bricklayer, told me that he had to leave an account of the inspector.
4944. Is it not a well-known fact that the inspectors are often particularly severe on certain men—I suppose they have their little grievances as well as other persons? Yes, they may have.
4945. Do you not know that it is so? I never saw anything of it.
4946. But, as a matter of fact, do not you know that it is the case among the men? Yes, I do.
4947. You say that Reid showed you a cask of cement, from which the cement to be tested was taken? Yes.
4948. When you saw the inspector—I think you said it was Gledhill—take the cement to be tested out of a cask, did you recognise it as the same cask that Reid had pointed out to you as the one which he was planting? All I know is that the cask was there, and that Reid said he would plant it.
4949. But did Gledhill take the test cement from the same cask? Yes.
4950. You are quite sure of that? Yes, quite.
4951. How many casks were there there from which tests would be taken? I only saw one.
4952. Did you ever tell the contractors what was going on? I never did.
4953. Since you left the employ of Carter, Gummow, & Co. have you ever had any conversation with Mr. Carter? Once.
4954. While you were in the pay of the firm did you ever meet with an accident? I did.
4955. How did it happen? I was endeavouring to get out of a tram while it was in motion, and I was thrown down.
4956. Were you sober at the time? Perfectly.
4957. Where were you taken to? To St. Vincent's Hospital.
4958. Was your salary paid during the time you were there? It was.
4959. Was anyone employed in your place while you were away? Yes, after a time there was.
4960. Did you pay for his employment in your place? I did not.
4961. You say you spoke to Mr. Carter once since you left the firm's employ? Yes.
4962. Did you ever ask him for any assistance? Not after I left the firm.
4963. Did he ever give you any assistance after you left the firm? He sent for me to see him at North Sydney on, I think, the 9th November, and he asked me if it were true that my family were starving. I said "Yes." He said "I cannot see your wife and children starve." He gave half a sovereign, and I afterwards learnt that he had paid my baker's bill for three months.
4964. Did he give you anything else after you left the firm? Yes, he gave me a cheque for £20.
4965. What was that for? I had asked him for £100 on a previous occasion and he gave me a cheque for £20.
4966. What for? To assist me.
4967. That was in 1893 you say? Yes.
4968. After you had left the employ of the firm? Yes.
4969. After your engagement was at an end? Yes.
4970. Did you consider the £20 a bribe? I had not asked for it. I had asked for the loan of some money and I offered to give him a receipt for it.
4971. But do you consider that he gave you the money as a bribe or out of pure good nature? From good nature if you like.
4972. That is a little way of Mr. Carter's,—he is good-natured to those who are deserving of it when they are in a less fortunate position than himself? In this case I asked him if he would give me £20, and he said he would. I said, "Shall I give you a receipt?" and he said, "No, you need not do that."
4973. *His Honor.*] Did you consider it a gift? I asked for the money as a loan, but when Mr. Carter refused to take a receipt I did not know whether to regard it as a gift or not. I never attempted to pay it back.
4974. *Mr. Gummow.*] As a matter of fact you treated it as a gift? I did.
4975. Do you not know that Mr. Carter is very liberal? I think he is.
4976. At all events you did not consider the £20 a bribe? No, certainly not. Had it been offered to me as a bribe I would not have taken it.
4977. Do you think that if, under ordinary circumstances, Mr. Carter saw a man in bad health, especially a man he had known well, he would be likely to help him? I believe he would.
4978. *Mr. Smith.*] When did you see Jack Reid last? About fortnight ago.
4979. Did you see him before you saw Mr. Parkes? I saw him in the street, but I did not speak to him.
4980. When did you last see him to speak to? About a month or six weeks ago.
4981. Did you talk about this thing then? A little.
4982. You did talk about it? We just mentioned it.
4983. What sort of a man is Jack Reid—is he a sober man; have you ever seen him the worse for liquor? Very rarely.
4984. When he is in that state his tongue runs pretty freely? I dare say it would.
4985. Did he ever tell you that he had been turned away from a job at North Shore? No.
4986. That he had been moved from it I mean? Not that I know of.
4987. He never told you that? Never.
4988. He never told you that Mr. Hickson had insisted upon his removal from a job at North Shore? Never.
4989. *Mr. Parkes.*] Where does Jack Reid live? As far as I know he is living at Waverley.
4990. When was your last payment for services made to you by Carter, Gummow, & Co.? I think it was in the first week in April, 1893. Mr. Carter told me that they would pay up to the end of March, and the fortnight fell, I think, in the first week in April.
4991. Was the £20 in addition to that payment? Yes; I looked upon it as a gift when Mr. Carter refused to take my receipt.
4992. Mr. Carter has always been a generous man with his employees, has he not? Yes.
4993. If Mr. Carter gave an inspector a spirit stard as a wedding gift it could not be looked upon as a bribe? No; I should not have thought anything of it if Jack Reid had not made the remark he did.

4994. *Mr. Smith.*] What was the remark he made? He said he did not begrudge it him, as he had done the firm some service at North Shore. G. S. Chiene.
4995. *Mr. Parkes.*] What other men were working on the Glebe job beside Reid, Byrnes, and Goddard;—do you know any of them? I should know a great many of them if I saw them. I do not remember their names now. I believe Jimmy Hoskins was working there, but I would not be quite sure. 24 June, 1896.
4996. Did you take measurements for the job? Only when we were driving.
4997. Only for the driving? Yes. I took cross-sections with the Government engineer
4998. Have you any idea of the size of the excavation? I have no records.
4999. *His Honor.*] Do you happen to know in what part of Waverley Reid is now living? Near Denison-street, I think.
5000. Has he been living there some little time? Since he left Carter, Gummow, & Co., I think.
5001. *Mr. Gummow.*] With regard to the spirit-stand, did you not say that you regarded it as a bribe? Yes, when Reid made the remark he did, otherwise I should not have done so.
5002. As to Reid's remark that he did not begrudge the spirit-stand, was Reid a member of the firm, or had he any interest in it? No. I took it that he was jealous, and that he thought he was not getting enough pay himself.
5003. *His Honor.*] From Carter, Gummow, & Co.? Yes.
5004. What was his pay, do you know? £3 a week.
5005. Did you hear Reid grumble about his pay on more than one occasion? Yes; he grumbled more than once about it to me.

William Gilliver sworn and examined:—

5006. *Mr. Parkes.*] You are a contractor of some standing? Yes; I have been a good while at the game now. W. Gilliver.
5007. Have you carried out many sewerage contracts for the Government? I have carried out several. 24 June, 1896.
5008. In carrying out these contracts you have tendered upon a form in which the Government put down not only their own quantities but also approximate prices? Yes.
5009. And at times you have had good prices as well as bad prices? Yes, the prices being a percentage on or off, as the case may be.
5010. Have you always done that? No. The Government do not supply quantities just now. The system has been changed about a good deal. At one time the Department supplied quantities but not prices.
5011. How long ago is that? Two and a half years.
5012. After that what did they do? They fixed quantities and also prices. We tendered per schedule.
5013. *His Honor.*] You tendered, then, at a percentage? Yes, at a rate above or below the schedule or at par.
5014. *Mr. Parkes.*] How long have you been tendering in this Colony? About seven years.
5015. Going back from two and a half years ago, quantities only were issued to the contractors, were they not? Yes, without prices.
5016. *His Honor.*] The latest form of tendering, I understand, is without quantities? Yes.
5017. *Mr. Parkes.*] Two and a half years ago schedules were issued with prices attached? Yes, I am now speaking of a job we did at Rookwood—I mean the drainage of the Necropolis. There were quantities in that case without prices. Since then, in the case of other jobs we have carried out, there have been prices attached and also quantities. Now you have to confine yourself to the prices. You have to tender on or off, or at par, for the whole of the items.
5018. Have you tendered in other cases apart from the Government where quantities were given? Yes. We have done some water-works for municipalities.
5019. In those cases the quantities have been given? Yes; there would be an approximate quantity. It would be at per yard run.
5020. But there would be no prices given? No; you fixed your own prices.
5021. To return to your explanation, a change in the case of the Government tendering was made about two and a half years ago under which prices also were put in? Yes.
5022. And there has been another change lately? Yes, that is the change affecting the sewerage contracts now advertised.
5023. What change is that? No quantities are given, only prices.
5024. The contractors have to fill in their own quantities? Yes. They tender at a percentage.
5025. But putting in their own quantities? Yes. I presume they would take out their own quantities in order to arrive at values—to see what percentage they could take off.
5026. In the middle of last year a change in the quantity sheets was again made, under which you were asked to tender at a certain percentage below prices? Yes, or above.
5027. *His Honor.*] The quantities and prices being also given? Yes.
5028. *Mr. Parkes.*] You tendered for No. 77 Contract? Yes.
5029. When the tenders for that contract came in, you saw that another firm of contractors had received the work at a lump sum? Sometime afterwards. Carter, Gummow, & Co. were the lowest with the percentage off. They also put in a lump sum tender of, I think, £15,500.
5030. Would it ever occur to you, as a contractor, that you would be permitted to send in a plan of your own with a lump sum tender which might be accepted? According to the conditions of tendering I should think that a lump sum tender would be ruled informal. If I am not mistaken it says so in the forms and conditions of tendering. I think you will find that stated on the front page of the tender form. If you turn up the tender form for that particular contract you will find it is so.
5031. It says on the front page, "In pursuance of advertisement in the *Government Gazette* I (or We), the undersigned, do hereby tender to provide the material and perform the various works required in and about the full and proper construction, erection, and completion, of the northern main sewer, Leichhardt and Annandale section, Contract No. 77, agreeably to the plans, specification, schedule to specification, special condition, and general conditions, which have been inspected by me (or us), &c." There is then a marginal note which says, "Here insert 'under' or 'above,' as the case may be, or erase the words 'per cent.' if the party is desirous to abide by the prices as fixed";—you think that that would not permit of your sending in a lump sum tender? It would not. [*Vide Appendix No. 12.*]
5032. It does not contemplate it? No. 5033.

- W. Gilliver. 5033. *Mr. Parkes.*] There was another instance in which Carter, Gummow, & Co. sent in a lump sum price on similar lines for a job for which you tendered? On a job in which we were second, and which is now being carried out by M'Sweeney. I think it was Contract No. 107. I know that the work runs across Stanmore.
- 24 June, 1896. 5034. Did they in that lump sum beat you and the other contractors? They did at the lump sum, but I should like to explain matters in connection with that contract. The office estimate was £32,000 and some odd pounds; and, running it out at these quantities and prices, Carter, Gummow, & Co. tendered at £29,111. They also sent in a lump sum tender at £23,000, which was the lowest. M'Sweeney's tender worked out at £24,000. I had them worked out at the time, and I wrote about it to the Under Secretary for Public Works.
5035. Where did you get the copy of the tenders? My engineer worked it out from the tenders in the Public Works Office.
5036. There is no doubt that his figures are correct? I do not think there is any doubt about it.
5037. Although Carter, Gummow, & Co.'s prices worked out at £29,000, they put in a lump sum tender for £23,000? Exactly.
5038. What did you contractors do in that case? We discussed the matter, and it was arranged that I should write to the Minister taking exception to the acceptance of any tender at a lump sum.
5039. And you did so? Yes. If lump sum tendering was to be allowed in that case we were prepared to take up the job at less than £20,000. The quantities were in excess of what they actually came out at on the plans. Our engineer went into it, and we found that we could take the job for less than £20,000. I remember writing to the Under Secretary to that effect. I suggested that fresh alternative tenders should be invited with a lump sum, so that all contractors should have an equal chance of tendering, but we had no reply, and, as a matter of fact, M'Sweeney's tender was accepted.
5040. Did you ever have any conversation with any of the officers about this form of lump sum tendering? The matter was discussed by the contractors and engineers, and we thought it very unfair that any notice should be taken of a lump sum. We thought that if a lump sum tender was to be received all contractors should be put upon an equal footing.
5041. Did you have any conversation with Mr. Hickson about the matter at that time? No; I only wrote to the Under Secretary for Public Works.
5042. Under these circumstances, did the contractors get alarmed about the system of public tendering? Well, we wanted to be put on an equal footing.
5043. And as a result of your discussion a deputation waited upon me? That is so.
5044. *His Honor.*] That would be later on? Yes.
5045. What you have been referring to happened some time previously? Yes.
5046. *Mr. Parkes.*] When did it happen? I suppose you are referring to the deputation. I do not know the exact date, but it was after tenders were accepted upon the Monier plan that we waited upon you.
5047. That is when the lump sum system came into operation? Yes.
5048. The body of contractors who waited upon me laid certain matters before me? Yes.
5049. Will you tell His Honor what they were? It principally turned upon the question of one firm of contractors being allowed to tender at a lump sum, and their tender being accepted; and, as contractors, we wanted all to be placed upon an equal footing. Of course many other things cropped up. One had one thing to say and another had another thing, and so on. My object in waiting upon you was to have the thing ventilated. I had written to the Under Secretary on behalf of the contractors, and since a lump sum tender had come up a second time in connection with this particular job, we thought it right to take action to protect our interests, and to put us all upon an equal footing.
5050. Did you not represent to me that if the Monier system were adopted one firm of contractors would have a monopoly of the work? Yes. Of course, they had a monopoly if they had the patent. At that time I did not know whether it was clear that they had.
5051. As a matter of fact, as a contractor, would you hesitate at the present time about entering upon a construction of ironwork and compo.? The thing is entirely new to me.
5052. You have never done such work before? No.
5053. Coming to Contract No. 77, I believe you are carrying out the adjoining contract? Yes.
5054. In Contract No. 117 you are paid at the rate of 28s. per cubic yard for excavations in rock where charges of powder not exceeding 4 inches in length are allowed? Yes, less 9·01 per cent.; upon Contract No. 77 the price is £2 17s. [*Vide Appendices Nos. 12 and 16.*]
5055. That is your actual payment? Yes.
5056. Will that price pay you? I hope so.
5057. Do you think it will? Yes.
5058. You are satisfied with it? Yes. I expect to make 12 per cent. out of it.
5059. Is there any difference as regards the solid rock to be excavated where 4-inch charges of powder are allowed as between Carter, Gummow, & Co.'s job and yours? No; it is all about one class of ground. If anything, they have a bit the best of it, because they have a bigger tunnel than we have, and the bigger the tunnel the lower the price at which it can be taken out.
5060. Have you any excavation in your contract where guttering and gadding only are permitted? Yes.
5061. What is the rate at which you are being paid? £1 15s. per cubic yard, less 9·01 per cent.; the price on Contract No. 77 is £3 5s.
5062. *His Honor.*] Your contract is No. 117? Yes.
5063. And it follows on from No. 77? Yes; we junction with Carter, Gummow, and Co.'s job midway in the hill.
5064. On the north-west side of White's Creek? Yes.
5065. *Mr. Parkes.*] Let us now take bluestone concrete in any situation—what are you being paid for that? I think the Government price is £2 per cubic yard.
5066. What is the price in Contract 77 for bluestone concrete in any situation? £2 10s.
5067. Do you think £2 will pay you? Yes.
5068. Will it pay you well? I expect to make from 10 to 15 per cent. upon the whole contract.
5069. Taking the whole of the prices, as far as you can recollect them, in the case of Contract 77, they represent a great increase upon the prices in Contract 117, do they not? Yes; in some cases they are 100 per cent. higher.
5070. And the nature of the work is not different? No; it is the same. Their drive, however, is a little larger than ours, and they have a slight pull upon us in that respect. 5071.

5071. You have had some experience of the system of tendering under which the Government have issued prices, as well as quantities? Yes. W. Gilliver.

5072. The contractors, of course, find it to their own interest to take advantage of that system? We could not find any advantage in it. 24 June, 1896.

5073. *His Honor.*] I wish to understand clearly the three systems of tendering to which you have referred. Under the first system I understand quantities only were given, and the contractors had to supply the prices? Yes. That was in vogue up to about two and a half years ago. In no case, then, did the Department fix prices.

5074. Under the next system the Department fixed the prices as well as the quantities? Yes.

5075. And under the third system the Department fixes the prices only without fixing the quantities? Yes.

5076. *Mr. Parkes.*] Under the second system the Department fixed the prices and quantities, and the contractors had to take all the responsibility—the prices given by the Department being only leading figures? The items in the schedule which had the prices fixed against them might be increased or diminished, and you were paid at that rate. You could not work the thing out at those quantities.

5077. The second system, I understand, was the system under which Contract 69 was taken—that is, the quantities and prices were set down, and the contractors were asked to tender, sending in their own prices? Yes.

5078. Under the third system the contractors were asked to tender at a uniform percentage below prices? Yes.

5079. *His Honor.*] It was a percentage system still? Yes.

5080. The second and third systems, I understand, both involve a percentage tendering? Yes.

5081. *Mr. Parkes.*] Under the old system there was always a check put upon contractors to prevent their dodging about with their schedules to their own advantage. For instance, the Government said “The quantities are not guaranteed as correct, and are merely for the guidance of tenderers, who may satisfy themselves as to their accuracy, which is not in any way guaranteed by the Government, and they are subject to omissions, deductions, or alterations.” They also have a check in the general conditions, in which they say—

If at any time whilst the works are in hand it shall be deemed expedient by the Engineer to order material or work of a different description to that specified, or to increase or diminish the dimensions or extent of any works to be done under this contract, or to alter their situation or vary the form or dimensions of any of the said works, or of any part thereof, or to make any deviation or to substitute one class of work for another, he shall have full power to do so, and to order and direct any such increase, diminution, alteration, deviation, or substitution, and the works involved in any such increase, alteration, deviation, or substitution, shall be executed by the contractor if of the class of works provided for in the schedule of prices, at such schedule prices; and no such increase, diminution, alteration, deviation, or substitution, of works shall in any way annul or set aside this contract, or extend the time for the completion thereof, unless the Minister shall see fit to grant such extension; but such additions or alterations shall be measured and paid for, or deducted from the contractor's account, as the case may require, according to the schedule of prices.

So that if the contractor has extravagantly high prices the Department can avail themselves of that and the other clause to prevent him from getting the best of the Government? They have done so in some cases; they did so at Rookwood.

5082. What contract was that? The Necropolis drainage. They knocked out a bridge in that case. It was in the contract. By knocking it out they put us to a great deal of cost in the cartage of the material. We relied upon the construction of the bridge as being a means of getting material from the railway station. We objected to that alteration, and we wrote a number of letters about it.

5083. Why did they take it out? On the score of economy.

5084. Because you had a good price for it? We had a fair price for it. I think that it was knocked out on the score of economy. Since then the Minister has given £100 to the Municipality of Rookwood to build this bridge. We put in a claim for extra cost of cartage, but we did not get it. Mr. Hickson decided that he could knock out one class of work and substitute another. We put three small brick abutments to carry some iron pipes across the creek, which were shown to be suspended under the bridge. We also put in a claim for loss of profit on the bridge, and that was disallowed.

5085. Have you any case where you have had £50 a yard for bluestone pitching of the value of 25s. a yard, and been allowed to receive payment for a larger quantity at the high rate? We never had anything like that. In our case, we had an even schedule as nearly as it could be made so.

5086. You made no effort to catch the Government? No.

5087. Would you expect to get such a high price as that I have named for such work? I should expect them to substitute something else as they have done in other cases.

5088. They had the power under the conditions of the contract to substitute something else? Yes; Mr. Hickson distinctly told me so. That was his decision.

5089. You would not expect to receive, in such a case, an increase from £600 to £1,875 so far as that particular item is concerned;—you would not expect to receive that amount of extra work at £50 a yard? Would you ever dream of receiving such an amount as an extra? Do you know of any case in which such an item has been increased threefold. I should consider that we were very lucky, but I should not object to take it. [*Vide Appendix No. 14.*]

5090. But, as a business man, you would not dream of getting it? No; I certainly should not.

5091. Do you think any contractor would expect to get it? I could not speak for others.

5092. Do you remember any case in which any firm of contractors have received kindly handling like this? I do not.

5093. Coming to excavations, in the price for excavations is it not the custom of contractors to tender for the timbering necessary to uphold them? The Department put down 2s. a cube foot for timbering, but the contractor would have regard to the nature of the ground. He would take the value of the work at so much a cube yard, and would put into that value so much for the timbering.

5094. It is only the roughest class of wood that is used? It is round timber.

5095. It is left in the ground, is it not? In some cases.

5096. It is looked upon as valueless? When it is taken out of the ground we do not look upon it as being of any value.

5097. *His Honor.*] As to its being left in the ground, I suppose that if it is to be left in the ground it has to be a good class of timber? Of course if it is left in the ground the contractor would be paid for it.

5098. And it would have to be a sound class of timber? It is ordinary round props.

- W. Gilliver.  
24 June, 1896.
5099. What I mean is this: when the contractor is allowed to leave the timber in the ground, the timber, as it were, forming part of the filling,—is there not a special provision that that timber shall be of a particular class, so that it may not count for nothing in the filling? In all cases the timber is subject to the approval of the departmental officers. If the timber were not good it would be rejected if the Department were paying for it.
5100. When you are timbering to support a drive, the timber is in some cases taken out altogether? Yes.
5101. And sometimes by the permission of the inspector or engineer it is left in? Yes. In some places it would be absolutely dangerous to take it out.
5102. And when it is left in what is done? The Department pay 2s. a foot for it.
5103. But will the Department ever allow timber to be left in if it be inferior timber intended originally to be removed? Bad timber would never be allowed to be put in in the first instance. The inspectors would look after that part of it—at least, that is my experience. I do not think any contractor would put in bad timber, because the risk of having the men hurt would be too great.
5104. *Mr. Parkes.*] The timber is part and parcel of the contractors' plant? It would be where you fix your own prices.
5105. It is only left in the drives for the convenience of the contractors? Not necessarily. In some places it is absolutely dangerous to take it out.
5106. But it will in time perish, will it not? I suppose it will.
5107. But cheap round hardwood scaffolding is better than pine, is it not;—it is more costly timber, and the harder it is the better the material for the purpose? They usually get sawn timber for the tunnelling, and round timber for the cap-pieces and props.
5108. It is generally included in the sum for excavation? It would be if the contractor were fixing his own prices.
5109. Have you ever had to build sewers where subducts were specified? Yes; but we have never put them in. We have never, under this Department, had to work in bad ground, necessitating the subducts. It has been hard ground.
5110. These subducts would not be included in the excavation items? No; I do not think so; 1s. 6d. or 2s. a yard run is allowed for them.
5111. Will you look at this clause:—

Subducts to be constructed, when decided on, along lines of tunnels and open trenches commencing on each length midway, or thereabouts, between two working shafts or faces, 33 inches below invert of main sewer, branches, &c., or as shall be directed at the time, and having a fall towards each working shaft or face, of such gradients as may be determined at the time, after the thickness of sewer-lining required for each length between shafts or faces has been ascertained and ordered. Subducts of 9 inches, or of a greater or less internal diameter, if directed, to be laid immediately underneath the timber floor of tunnel or open trench, or at sides of sewer, in hardwood boxes varying in size and dimensions as shown on drawing. Said boxes to be laid straight and true to levels decided upon, and the pipes to be laid therein, upon, and surrounded by, sandstone chippings and quarry refuse. Dry stone packing to be put over pipes, as specified in clause 21.

No doubt that clause comprises the whole of the subducts? Yes.

5112. It is supposed to be an individual item outside of ordinary excavation? Yes; but what would the schedule say in that case?
5113. Supposing we allow the excavation to go out, would 1d. a yard for subducts be sufficient to pay for them? Certainly not.
5114. Coming back to Contract 77, I want you to tell me what you know about that contract;—do you think there is any extra special method adopted of putting the compo in? I would not like to hazard an opinion. I have only seen the work casually in walking to and fro; I have never stopped to look at it, but as far as I have been able to see there is nothing special about it. It is a thing which we would tender for to-day or to-morrow if we could get the right to use the patent. If tenders were invited by the Department for that class of work, and we could obtain the right to use the patent, we would certainly tender.
5115. What do you consider the price of the compo.? The value of the particular class of work they are doing in Contract 77 works out at £1 11s. 2d. per cubic yard. I have given the thing some little consideration. I make out my estimate in this way:—I take 1,050 cubic yards of compo., with a gauge of 3 to 1, and I take the cement at 10s. a cask; and there would be 66 tons of iron fixed in position at £13 a ton. The cube yard works out in this way:—I take two casks of cement at 10s., that is £1; 1 cubic yard of sand at 4s.; water, 2d.; the centering, distributing the cost over the whole 1,050 cubic yards, I make 2s. 6d.; and I allow 4s. 6d. for labour; that brings out a total of £1 11s. 2d. for the compo. I then add 1½ cwt. of iron, at 16s. 3d. per cubic yard; also 10 per cent. profit, and 15 per cent. for patent rights, making a grand total of £2 19s. 11d. That is the price at which I should be prepared to take similar work.
5116. Your estimate includes the centering and all the contractor's plant? Yes.
5117. As a matter of fact, is not good bluestone concrete more costly than compo., taking the Department's own prices? £3 a yard is the usual price for special concrete which is used to put round man-hole covers. That is what we get. We have put special concrete round man-hole covers at that price, where in another case £50 a yard has been paid.
5118. Did you tender for contract 101? No. I was in Queensland when that was let.
5119. Did you ever do any work under the Queensland Government? Yes, for about twenty years.
5120. What system do they use there in their tendering? They give you the quantities, and you fix your own prices. They do not even guarantee the quantities. They make the contractors take the risk. You would be paid on the actual measurements at the prices they fix. They fix a price to arrive at the lump sum and to ascertain the lowest tender, but the quantities may be increased or diminished.
5121. Did you ever hear of that form of tendering being used to the disadvantage of the Government? Not to my knowledge.
5122. Is it not the universal system of tendering on the continent of Europe? I could not say.
5123. At all events, you never heard of engineers allowing the system to be used to the detriment of the Government in Queensland? I could not say that I did. I was principally managing works for others in Queensland. I was manager for five years for J. and A. Overend, and for six years for O'Rorke and M'Sharry. I do not know anything about contract work outside of the colonies. My experience is confined to Queensland and New South Wales.

5124. I suppose you have taken some notice of the construction of the Monier arch. In your opinion, as a contractor, is it a safe structure or not? I could not say. I should not like to say, because I do not know. I am not an engineer. I am a practical man, and I could not calculate the breaking strain and all that sort of thing.

5125. What is your experience of the effect of our climate upon constructions of that sort in compo.? I could not say.

5126. Have you had no experience of that sort of work? Very little. There is general talk among contractors, and perhaps they speak as they wish. They seem to think that the whole thing will collapse. I really do not know anything about it. I do not feel competent to express an opinion, and I should not like to hazard one. I should be prepared, as I said, to take the same class of work at £3 per yard, and pay the royalty of 15 per cent.

5127. That would include ironwork and everything? Everything.

5128. Have you looked into the cost of the Monier work in other respects? No. I have only passed by the job now and again. It is a little bit off for one contractor to go dodging about the work of another man. I would not do so on principle.

5129. About the North Shore contract—is that not one of the works in regard to which you complain that it was let without tender? Yes. We anticipated that the other two contracts which have since been let would be given to Carter, Gummow, & Co. in the same way.

5130. You wanted to put a stop to that? Yes. And that was why we made it one of our complaints to you when we waited upon you as a deputation.

5131. Was there any justification for giving that contract without tender? No. There could not be.

5132. Was the outfall made? It was not commenced.

5133. If there was time to call for tenders for a third contract there was plenty of time to call for tenders for 79A, the second contract? Yes. As one of the public of New South Wales, I think the Department made a big mistake in starting at the end of the sewer at which they did start. I think they started at the wrong end. If they had started at the outfall the sewerage works would have been bringing in a good revenue now. Hundreds of thousands of pounds have been expended upon sewerage, and until the outfall is built the sewers cannot be used. As soon as the sewers can be used I presume the people would be asked to lay a line of pipes for the connections, and in that case I presume persons would have to pay for the sewerage in just the same way as they would have to pay for water supply. Our sewers have been in course of construction for seven or eight years, and they are not in use yet, although some have been completed for about five years. Meantime the public has to pay interest on the money. Some of the sewers might have been working a long time ago if the Government had started at the lower end.

5134. Did you look into Contract 79A at all? No.

5135. I mean as to the prices? No. We tendered the other day for the job that Butcher Brothers got—a continuation of that contract.

5136. It was a similar work? Yes.

5137. An addition to that line of piping? Yes.

5138. What was your percentage below Carter, Gummow, & Co.'s contract for 79A? I did not know what their price was for 79A.

5139. What was the price below the Government estimate at which the tender was let? It was twenty-four per cent. above.

5140. That was the tender which was let for this third length? Yes. We were second.

5141. *Mr. Smith.*] Contract 79A was an extension of Contract 79? I understand that it was.

5142. It is not altogether an unusual thing for a contractor who has an original contract to take any extension of that contract? No; we have done it in one case.

5143. At Rookwood? Yes.

5144. You had an original contract there, and an extension of that contract was given to you without tenders being called? That is so.

5145. What was the amount of that extension? I remember that it came to about £6,000.

5146. What was the amount of the original contract? About £6,000, I think. I know that the two things panned out at between £12,000 and £13,000.

5147. As to Contract No. 107, I believe you wrote a letter to the Under Secretary for Public Works on 15th February, 1895? Yes.

5148. The document I hand you is a list of tenders opened on 13th February, two days before your letter was written? Yes; assuming the figures to be correct.

5149. You will see there a minute by Mr. Bagge, in which he recommends the acceptance of McSweeney's tender at 29 per cent. below the rates quoted in the schedule of quantities;—you will see that that minute is dated 15th February? Yes.

5150. I think if you refer further to the document you will see that the acceptance was recommended for confirmation by Mr. Hickson on 28th same month? Yes.

5151. You said, I think, that you did not receive an answer to your letter? Well, I received the usual acknowledgment of its receipt; that is all. But when we saw that McSweeney's tender had been accepted we were perfectly satisfied. We did not want any reply.

5152. As a matter of fact the acceptance of McSweeney's tender was recommended on the very day upon which you wrote your letter? It seems so.

5153. With regard to Contract 77, you sent in a tender 18 $\frac{3}{4}$ ths below schedule rates, and Carter, Gummow, & Co.'s tender was 28 $\frac{1}{2}$  below? I believe it was.

5154. There was 10 per cent. between you? Approximately, yes.

5155. You also sent in a tender for 117, did you not? Yes.

5156. I think your tender was 9.01 below schedule rates? Yes.

5157. So that comparing Contracts 77 and 117 there was 9 per cent. difference between your rates, taking things all round? That is not a fair way in which to put it. The aqueducts to be built under the Government plan in the case of 77 were very costly.

5158. But there was 9 per cent. difference between your two tenders? Yes; but you must take the surroundings into consideration. The mere figures are no guide.

5159. You said you had not seen much of the Monier arch work upon Contract 77, and that you did not intend to hazard an opinion about it? Quite so.

5160. You said you did not think there was any special work about it? I did.

5161.

W. Gilliver.  
24 June, 1896.



- W. Gilliver. 5161. Would you be astonished to hear that we had been told by a witness who has examined the work in connection with these Monier arches that there is very special work required, and that the compo, could be put in only in small quantities; that it is more like the weighing out of sugar than the construction of a public work? I should take that statement to be absurd. When a gauge of stuff is mixed and run up by the barrowload there is no weighing out of sugar about it; all that sort of thing is bunkum.
5162. You do not believe that story? No.
5163. You do not believe that the stuff has to be handled in a way different from the ordinary practice? There is a little more timbering required perhaps in the construction.
5164. But with regard to the mixing and handling of the compo.? There is nothing special at all in that.
5165. I suppose your estimate of £3 per yard for the compo. is based upon the assumption that there is nothing different in the mode of handling it? I have allowed 4s. 6d. for labour, and I think that is quite enough.
5166. But you base your estimate of £3 on the assumption that there is nothing special about the work? Yes. I have allowed 100 per cent. more for labour than would be allowed in the case of ordinary concrete.
5167. I believe you went to Mr. Parkes on the occasion of the deputation which has been referred to? Yes.
5168. That was after the acceptance of tenders for Contract 77? Yes.
5169. Which seems to have disturbed all you contractors? Yes; self-interest comes in, you see.
5170. Who went with you on that occasion—who were in the room? Altogether there were fourteen. I do not know that they were all there at that particular time now I come to think of it, but there were fourteen who mutually agreed that we should take that step in our endeavour to put a stop to that state of things by having it brought before the House.
5171. Who were in the room while you were there? Maddison, Ewing, Williams, and O'Neill. I am not quite sure whether one or two of the Butchers were there.
5172. Is there anyone else you can mention as far as your memory serves you? I think I have told you all who were there at that particular time.
5173. There were seven or eight, then? Yes, besides myself. There were about fourteen altogether who agreed that we should wait upon Mr. Parkes.
5174. But were they all there together? No, not at one time; but we have often met and discussed matters since then.
5175. I am referring now to this particular occasion? There were about ten there, I think, as far as my memory serves me. There may have been more.
5176. I think you said that the chief question brought forward was the acceptance of this lump-sum tender. That appears to have been the chief grievance? The grievance was this—that we as contractors wanted to be put on an equal footing at the tender-box.
5177. What do you mean by that? I mean that one contractor should not get any preference over another.
5178. But in what way—in what respect? As regards the sending in of a lump-sum tender.
5179. But by that time Contract 107 had been dealt with and McSweeney had got it? Yes.
5180. You knew that? Yes.
5181. Was there any other cause for making you think that you were not on an equal footing apart from the lump-sum tendering in the cases of Nos. 77 and 107. I want to know what it was which made you think that you were not on an equal footing? I have already told you of this particular firm tendering twice at a lump sum, and of one of their lump-sum tenders being accepted upon plans quite different from those upon which we tendered.
5182. But Contract 107 had been disposed of—Carter, Gummow, & Co. had not obtained the contract; McSweeney had obtained it? So you have told me.
5183. But you knew at the time the deputation waited upon Mr. Parkes that No. 107 had been let to McSweeney at schedule rates? Yes; I saw that in the papers.
5184. Therefore the lump-sum tender sent in by Carter, Gummow, & Co. had not been accepted by the Department? Not at that time.
5185. So that at the time you waited upon Mr. Parkes the only other cause for disturbance was the acceptance of the lump-sum tender in the case of Contract 77? Yes, and what might follow.
5186. Was there any existing fact beside that which was moving you at the time? One grievance of the other contractors was that Carter, Gummow, & Co. had received an undue preference in receiving three or four contracts without tendering at all for them, and they anticipated that the same firm might obtain contracts for which they have since had to tender—for instance, the one that Butcher Brothers got. That was not my grievance. I knew nothing about the North Sydney matter. You know of my letter, and I wrote in that letter what I meant.
5187. But the only fact which weighed with you at the time of the deputation was the acceptance of the lump-sum tender in Contract 77? With me individually, yes.
5188. What were the other concessions to this firm of contractors which you heard mentioned on the occasion of this deputation? There was the matter of £50 a yard for bluestone pitching.
5189. That was mentioned? Yes. They had a price in their contract for freestone pitching at 25s. a yard, but there was also £50 a yard for bluestone pitching, and the quantity in the case of the bluestone pitching was considerably increased. In other words, the firm had been spoonfed. There was no free-stone pitching put in.
5190. What contract was that upon? The Marrickville contract. That was one of the things which was brought before Mr. Parkes, although not by me, because I knew nothing about it.
5191. Do you know who it was who brought that matter before Mr. Parkes? I think it was one of the late partners of the firm.
5192. Of Carter, Gummow, & Co.? Yes. The late partners had a good deal to say—a good deal more than they had to say when they were giving evidence here I noticed.
5193. Are you referring now to one of the late partners who was examined here the other day? Yes.
5194. You mean Mr. Maddison or Mr. Ewing? I could not say which it was. But the matter has been common gossip among contractors and their friends, and among the engineers and merchants who had transactions with them.

5195. Was there anything else mentioned on this occasion in the way of concessions to Carter, Gummow, & Co.? Not that I can think of at this moment. They were talking away there for some time. I think I have told you all I know about it. W. Gilliver.  
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5196. You cannot remember any other specific thing being mentioned on that occasion by way of a concession to Messrs. Carter, Gummow, & Co.? A lot of things were mentioned.
5197. But can you remember any one of them besides the two you have named? I have told you several of the principal things.
5198. The principal thing was the acceptance of the lump-sum tender in the case of Contract 77? Yes.
5199. The other concession was the matter of the bluestone pitching in the Marrickville contract—that matter you say was mentioned by one of the late partners? Yes.
5200. What I want to know is whether any other specific thing was mentioned? Well, there were two branches to be constructed at North Shore, one of which Butcher Bros. got the other day.
5201. But tenders had not been sent in for that work at that time? If you look up the matter you will find that we tendered for it long before we saw Mr. Parkes.
5202. Had a tender not been accepted? I could not say. I know that we had tendered. Our tender was not the lowest, and the matter did not concern me very much.
5203. What were you afraid of in regard to that contract? That that section of the sewer might be given to this particular firm without their tendering for it.
5204. That is what you were afraid of? I was not, but the others were.
5205. Was there anything else mentioned in the way of concessions to Carter, Gummow, & Co.? Yes; there was the Johnstone's Creek matter.
5206. What was that? We were one of the tenderers for that job. Sixty or seventy of the unemployed went there and drained off the water. I think that matter was mentioned by Mr. Williams at the particular meeting I have been referring to.
5207. Can you remember whether any other grievance was mentioned? I cannot think of any other. We were discussing various matters there for some time. First one man and then the other was talking.
5208. But you can think of no more concessions? No.
5209. *Mr. Parkes.*] What about the substitution of the blasting for manual labour? That was also discussed.
5210. *Mr. Smith.*] You spoke on this occasion, I suppose? I did not monopolise all the time. I chipped in with the rest.
5211. I suppose you spoke more particularly with reference to Contract 77? Yes.
5212. Did you suggest any reason at all for this alleged concession on the part of the Government to Messrs. Carter, Gummow, & Co.? Certainly not. I give Carter, Gummow, & Co. credit for doing the best they can when they get a job. I was not concerned about what they did. I was concerned about putting them on an equal footing with us at the tender-box. I do not care if they made £50,000 out of their contract, once they had obtained it fairly.
5213. Did you suggest that there was any reason for the Department having accepted their lump-sum tender? No. As a matter of fact, I do not know of any reason. I know that it was done; that is all.
5214. You knew only that it had been done, and you wanted to have it stopped in the future? That is so.
5215. I suppose you did not suggest at all that this firm of contractors were identified with the Government in a most suspicious manner;—did you suggest anything of that kind? No.
5216. You did not suggest that they were identified with the Government? No.
5217. Did you hear anyone else there suggest it? No, I did not. I think every contractor would give the firm credit for doing the best they could for themselves. The only question with us was whether the Department would stand it.
5218. No suggestion of the kind I have stated was made at this meeting? No; I do not think so.
5219. If there had been any suggestion of that kind, you would have heard it? It might have been made, but I did not notice anything of the kind. There might have been a million and one things said, but I do not remember.
5220. *Mr. Gummow.*] As to Contract No. 77, had you not an equal chance of tendering with other persons? Yes, on the original plan—the plan supplied by the Department.
5221. Had you not a chance of putting in a plan for yourself? No, decidedly not.
5222. Why not? Because it had never been done.
5223. Had you not an opportunity to do it? Certainly not. I should have considered that it would be presumption on my part to do it.
5224. You may have thought that it would be informal, but had you not a chance of doing it? It never suggested itself to me.
5225. If it had suggested itself to you would you not have put in a tender? How could I put it in the tender-box—where was I to put the plan? Could I put it into the box? I suppose you would not expect me to put it into Mr. Darley's or Mr. Hickson's hands.
5226. You could have put it into the hands of the proper authorities, could you not? Who are the proper authorities?
5227. The Tender Board I suppose;—could you not have taken your plan to the Tender Board? Has it ever been done?
5228. The question is whether it was a thing which came within your idea of tendering? It had never been done, and I say so having been tendering continuously for seven years in all the Departments.
5229. You say you had no equal chance of tendering? I had under the original plan. If we had known that the Monier system was to be adopted we should have been prepared to tender for it also, putting up a cash deposit and not sureties.
5230. *Mr. Smith.*] And do the work as you have described? We have never failed in a job yet, and we have done a lot of second-hand ones that other persons have failed in. We have done some of the most difficult work in the Colony.
5231. *Mr. Gummow.*] In regard to your contract at Rookwood, you say there was an extension there of equal value to your original contract? It was better.
5232. Did you have any of your schedule rates altered for that extension? Yes.
5233. Were they improved or made less? There were some items in the extension for which we had no prices in the first contract. Those prices were agreed upon between the Department and myself. They would

W. Gilliver. would, I believe, at that time have been better prices than we should have got had public tenders been invited.

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5234. As a matter of fact, then, you did not disagree with the taking of the extension? No.
5235. I mean as a contractor? I will tell you how it happened. There was nothing in the thing to speak of, but we ourselves were there. We had our plant there, and it was a question of waiting while a tunnel was driven across the Parramatta Road. That would have taken us some months, and by taking on the extension we could finish Contracts No. 1 and No. 2 at about the same time.
5236. You took the extension? Yes; as a matter of fact, we asked for it.
5237. As to this second and third system of tendering under which the Government supplied quantities and prices in the one case, and in the other case prices only, does the altered system with no quantities make any difference to you in putting in your tenders? I do not mind our not being supplied with quantities.
5238. It does not affect your tendering? Not a great deal. Five years ago you could make £10,000 a year where you could not make £100 to-day through the altered system of tendering.
5239. I am referring now to the second and third systems under which the Government first put in quantities and prices and afterwards prices? I do not care a hang about the prices; I would just as soon tender lump sum as in any other way, without either prices or quantities.
5240. I am referring now to the difference between the second and third system;—does the alteration make any difference to you? Yes; I entirely disagree with it. It has knocked the contractors out altogether. We have been working three years, and have made absolutely nothing out of it. Before that we made £40,000 in three years. There is no more use for contractors now; the Department fixes the schedules, and fixes the rates at which we are to pay our men. The contractor now simply takes his bag over to the Treasury, takes his money out and hands it to the men; none of it sticks to our hands. There is nothing in it.
5241. I do not refer to the old system of tendering where the contractor put in prices—I am referring to the changes within the last two years or so, under which the Government first put in quantities and prices, and, lately, prices only? The fixing of prices in that way has killed contracting.
5242. *His Honor.*] But what is the difference between the two last systems—the percentage system giving quantities and prices, and the percentage system giving only prices and no quantities? It means that a contractor who is not able to take out quantities himself has to pay two guineas or so to a man who can do it.
5243. *Mr. Gummow.*] Will not a contractor, tendering under the first of these systems, take out his own quantities? Not necessarily.
5244. Would you rely upon the Government quantities? I have often tendered without taking the quantities out. We know where the sewer is, and the two chief items are excavation and concrete. If you get fair prices for them you do not care how the other things are.
5245. But do you not care whether the quantities of the Government are correct? Yes; we worked out quantities in the case where we objected to your lump-sum tender, and we found that we could tender at £20,000, although you tendered at £23,000.
5246. When you are trying to get a job, don't you go into the plans and specifications? No. I could make up a tender in half-an-hour. The quantities would not concern me if I saw the plans. We should look to the excavation and concrete as the leading features, and if the prices in the schedule for those things were fair the rest would be all right.
5247. But do you take out your own quantities? The quantities are put there, I presume, merely to arrive at a lump sum.
5248. But do the Government quantities affect you at all in making your tender, or do you take out your own quantities? In making out my tender I rarely take out quantities.
5249. But would you not wish to know what quantity of concrete, of brickwork, and of excavation there were in any given case? No; I should not go into that, and few contractors do. It really does not affect you. If you know that £3 a yard will pay for special bluestone concrete it does not matter whether they put in 300 yards or 3,000 yards.
5250. But if you had 300 yards of that concrete down at 60s., and 3,000 yards of it at 60s., do you mean to say it does not affect you whether there is 300 or 3,000 yards? So long as there is a fair profit it does not matter. The Department have decided that they can increase or diminish the quantities. I do not care myself if the sewer is 1 mile or 3 miles long so long as I know that the prices are good enough.
5251. I will assume that there are 10,000 yards of excavation at £10 a cubic yard in one contract, and that there are 1,000 yards of bluestone concrete at 20 shillings in another, would you tender on the same percentage for that contract as if there were only 1,000 yards of bluestone concrete at 20s.? At times you do; you have to do it.
5252. I am referring now to the making-up of your estimate of what percentage you will tender at above or below the schedule rates? You are entirely in the hands of the Department. They increase or diminish the quantities as the case may be. Contracting is really a game of chance when it is all over.
5253. You know that in a mile of tunnelling there will be a certain amount of excavation? They give the quantities at per foot run for tunnel excavation, so that there is no need to take it out.
5254. But you must multiply the section they give you by the length? Not necessarily.
5255. It is not necessary, you think, to take out quantities? In nine cases out of ten I do not do it.
5256. As to the subducts in the case of Contract 69, do you say that you would not expect to be paid for the excavation for the subducts under the schedule? I said I never put in any subducts.
5257. I am talking of this particular contract. The schedule at 2s. per lineal yard is not intended, I suppose, to cover the price of 6-in. pipe. Supposing the piping to cost 1s. 3d., would the extra 9d. cover the cost of the excavation? It might in soft ground, but it would not in solid rock.
5258. If subducts had been ordered in that case would you expect to be paid for the excavation in connection with those subducts? I never went into that matter. I have never done any of that work, and I do not know the value of it.
5259. *His Honor.*] As a matter of fact subduct work is not done round about Sydney? Not that I know of.
5260. *Mr. Gummow.*] As to the timber for the excavation, it is put down at 1d. per foot;—you said in your evidence, I think, that you considered the cost of the timber in taking out the cost of the excavation? Yes, if I can fix my own prices.

5261. Would 1d. a foot be a foolish price to put down for timber if you had the price of the excavation as well? You would have to be guided entirely by knowing, in the first instance, whether you would have to use much of it or not. If the ground were fairly good standing ground there would be nothing in the timber one way or the other. W. Gilliver.  
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5262. You mean that no timber would be put in? No. We had 1d. a foot for timber at Rookwood.
5263. If the ground were soft would you require timber? Yes.
5264. Well then, supposing you had a price for the excavation? I should take the value of the timbering, and put it into the excavation.
5265. As to the Rookwood contract, had you not other claims in connection with it—in connection with the pipe joints, for instance? Yes.
5266. Did you get what you claimed in that case? Yes.
5267. Do you know if any other contractors got such a thing? I do not know.
5268. Do you consider when you settled up your claim with Mr. Hickson that it had been fairly balanced for and against the contractor? It was fairly balanced by Mr. Davis, but not by Mr. Hickson. He simply wiped the thing out. Mr. Davis dealt with the claim as far as he could, and then he brought us into Mr. Hickson. We were not there two minutes. He said, "Disallowed! Are there any more questions, Mr. Davis?" And then we were shown out. I should have liked to give him my version of the matter, but he had gone into it, and decided what he would do. As regards the omission of the bridge in that contract, it has been decided in Queensland that the Department cannot alter the character of the work.
5269. You think you were unfairly treated because the bridge was shown upon the plans and Mr. Hickson did not give it to you? Most undoubtedly. The omission of the bridge cut off our right-of-way for the getting of material.
5270. Can you give us any further names of the fourteen contractors who you say agreed that certain action should be taken—who agreed that they had been badly used? I did not say that they had been badly used, but we wanted to stop you people from getting too far ahead of us. It was a question of self-interest. I do not blame you for getting ahead of us, but we wanted to bring you back to the mark if we could.
5271. You wrote a letter to the Under Secretary for Public Works? Yes.
5272. It was mutually agreed that you should do so? Yes.
5273. Can you name the contractors who agreed that you should do so? The contractors that I have already mentioned. The thing was generally discussed at the Public Works Office.
5274. You have named eight or nine of them? Yes. In addition to those I have named, there were Crosby and others—in fact, pretty well all the small contractors. There are three contractors who are not on a footing with us—Mr. Sweeney, Carter, Gummow, & Co., and Ahearne.
5275. What about Carson? He is engaged upon a railway. The balance present would be the small fry contractors.
5276. The rest did not bother? No; they were not with the deputation.
5277. *Mr. Parkes.*] In answer to Mr. Smith, you said that there were no suspicious circumstances brought up at the meeting of contractors which deserved inquiry;—do you mean to say that suspicious circumstances were not put before me? Pretty well every man had a grievance.
5278. Was any comment made upon Mr. Hickson, jun.'s, connection with the firm? Yes; it was spoken of.
5279. Have you read my first speech in Parliament, delivered in October last;—have you read the *Hansard* report of the speech? No, I cannot say that I have.
5280. Do you remember a written statement being given to me containing certain matters? I think I do.
5281. Will you read the passage marked in the *Hansard* I now hand you? Yes.
- 5281½. Does not that fairly represent what was said to me at that meeting? Yes; it does.
5282. Was not one of the complaints which was endorsed by all the contractors this: That if they had rigged a schedule, as it is called, they had to get justice, that is, if they had too much upon one item that item was pulled down; whereas if Carter, Gummow, & Co. rigged their schedules they were paid by the Department upon their rigging, although it might be very glaring? Yes, that was spoken of, but I do not know by whom.
5283. Was it not reported to me that the prices for guttering and gadding work were infinitely cheaper than blasting on certain figures given, but that in Carter, Gummow, & Co.'s case there was a substitution made of blasting for manual labour, which was not allowed to any of the other contractors? Yes; but it is absurd to say that you can do manual labour as cheaply as blasting. The Department itself makes a difference of from 15s. to £1 a yard between the two things.
5284. It was represented to me that other contractors could not get that concession? Yes; a thousand and one things were spoken of.
- 5284½. Innumerable things of this nature were spoken of; some schedules were taken, and the matter was gone into fully, and innumerable proofs were brought to bear that concessions were given to Messrs. Carter, Gummow, & Co. in fixing up amounts in their final payments which ought not to have been in those final payments? Just so.
5285. *Mr. Smith.*] I think you said just now, in answer to Mr. Parkes, that a written statement was handed in to him by the deputation? I remember a paper being passed from some one to Mr. Parkes, but what was in it I do not know. I know, as a matter of fact, that Maddison told Mr. Parkes that Gillan had told him that a telegram had been sent by Mr. Carter to Mr. Gummow to the effect that young Mr. Hickson was to be taken into the firm at any price. That I will swear.
5286. Maddison said that at this meeting? Yes, before all hands.
5287. Was there any other reference made at this meeting to Mr. Hickson, jun., by anyone else? His name was freely discussed. It was looked upon as a great advantage to have him working for the firm, I suppose.
5288. Was anything said at the meeting of contractors to which you referred as to his being a partner—was anything of that kind said? No, I do not think so.
5289. When reference was made to the telegram was anything said about Mr. Hickson, jun., being taken into partnership? No; the matter was not discussed. I do not think anyone knew anything about it.
5290. With the exception of Mr. Maddison's statement? Yes; that was what he had been told by Gillan. Mr. Ewing did not seem to know whether Mr. Hickson, jun., was working for the firm or not.
5291. *Mr. Parkes.*] Was not a statement made to me very definitely about a conversation between Ewing, Maddison, and Carter? Yes, a conversation outside of the Bank of New Zealand. 5292.

- W. Gilliver. 5292. *His Honor.*] You saw a piece of paper handed to Mr. Parkes, but what it was you do not know?  
 24 June, 1896. No. I think Mr. Williams handed a piece of paper to him. Now I come to think of it I am quite clear about that.
5293. Did you see the contents of the paper? No; I do not know the contents.
5294. You did not hear it read? No.
5295. *Mr. Gummow.*] If Mr. Maddison said he was not at the meeting to which you have referred, would that be true? He would be telling a deliberate lie if he said so.
5296. *His Honor.*] There were, I believe, a first and second deputation to Mr. Parkes;—did the things to which you have referred occur the first time Mr. Parkes was interviewed on the subject, or the second time? I think it was the first time, but I could not be positive. I know that Maddison had been there more than once. I have met him there more than once.
5297. *Mr. Gummow.*] Was Mr. Ewing there? He has been there.
5298. Was he there when you were there with Mr. Maddison? I could not say, but on one occasion I know they were both there.
5299. With eight or nine others? Not at that time, I think.
5300. Were you present when Mr. Ewing and Mr. Maddison were there together? How could I say anything about it if I were not present?
5301. Upon this particular occasion to which you have referred, was Mr. Ewing there? I do not know whether he was there at that time or not. Mr. Williams was there, I know, and I think Bob and Sam Butcher were also there.
5302. But you could not say definitely whether at the deputation you have spoken of Mr. Ewing and Mr. Maddison were present together with yourself and others? No, I could not say definitely. I know that about fourteen were to have met there, and about ten turned up.
5303. As to the North Shore contract, you were one of those who tendered for that work? Yes.
5304. What was your tender? They beat us by 1 per cent.
5305. Was that above or below schedule rates? Above.
5306. Did you not say before in mistake that you were below the schedule rates? I could not say.
5307. As to the special bluestone concrete, do you know what it consists of? 5, 3, and 2, as far as my memory serves me. I have not done much of it except round manhole-covers.
5308. Suppose it is 7, 3, 2, would that be as good as material as 5, 3, and 2? No; I should not think it would be.

FRIDAY, 26 JUNE, 1896.

John Carter, recalled, sworn, and further examined:—

- J. Carter. 5309. *His Honor.*] With reference to Mr. Reid's employment—between what dates was he employed by you, and on what contract? Probably from 1890 to 1891 up to the beginning of 1896—during the last five or six years.  
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5310. Was he upon all the contracts you were carrying out during that time, or was he only on some of them? Only on some.
5311. Can you say which he was employed on? 79, 79A, 65, and 53. I think that is all.
5312. There may be some more? Sometimes he was sent from one to another temporarily, but I think I have given you almost the entire number of the contracts he was on.
5313. During that time what was the position he held under the contractors? He was a sort of working manager. He would be always there in case we were not there. He had to see that the work was set out and that the men were kept employed. He had to look after the plasterers and concreters and to see that they had material, and so on. He was a sort of foreman manager.
5314. During the whole of the time did you work as a contractor directly, or did you employ sub-contractors? Sub-contractors for the shafts and tunnels. That is the usual practice.
5315. In what position did Reid stand as to the sub-contractors? He measured their work up and saw after their lines and levels. If anything went wrong he would report it to us and to the Government engineer.
5316. Had he to see that the sub-contractors carried out their work properly? Yes, so far as the proper levels and lines were concerned.
5317. As to the brickwork and concrete, was that sublet? No, that was all day-work.
5318. It was only the driving and sinking that was sublet? Yes.
5319. Then as to the work done by the principal contractors—what was his duty as to the brickwork and the concrete? He exercised a general supervision over it. He was what you would call an overlooking foreman. I do not know whether I can make it plainer than that to your Honor.
5320. What salary did he receive? His salary varied. I think he started at £2 10s. and went up to £4. I know that I raised his salary once or twice. I know that he received nothing lower than £2 10s. and nothing higher than £4.
5321. When did he leave your employ? Three or four months ago.
5322. How came he to leave—under what circumstances was it? The cessation of work. We had no more need for his services. He practically received six or eight months' notice. I often discussed the matter with him, he being an old servant. I told him that after the completion of the North Shore work there seemed no possibility of further employment by us, and that he had better turn round and look out for himself. I asked him more than once if he had done so. He knew for six or eight months before he left that he would have to go as soon as the North Shore work was completed.
5323. Did you give him a certificate or any reference on his leaving? I did not. I supposed he would be seeking employment among the same class of employer, and that being so, he could get a personal reference at any time. He did not ask for a written reference, and it did not occur to me to give him one.
5324. There was no cause for his leaving your employment on account of misconduct or failure to do his work properly? No; it was simply from a cessation of work.
5325. You were going on with other contracts shortly afterwards? The work for us had been reduced to a great extent by the Government assuming the responsibility for the lines and levels. Besides that, Mr. Gummow and myself could not afford to be quite as extravagant in the management as we were a year or two ago, when work was more constant.

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5326. It was the need for retrenchment, then, that induced you to dismiss Reid? Yes.
- 5326½. How did he do his work while he was in your employment? All right so far as I know, or I should not have kept him. Of course, he had his faults, like everyone else.
5327. To what faults do you refer? He occasionally took a little more liquor than was good for him, but not during working hours. I can honestly say that it was only on very rare occasions that I saw him in that state. That was the only failing he had as far as I know.
5328. Did that cause him to come on to the works in the morning unfit for the proper discharge of his duties? I never saw him unfit for, or neglecting, his work in any way. I think that on the whole he did his duty very well indeed. Otherwise we should not have kept him.
5329. As to the mode of carrying on the work, what instructions did you give Reid? No instructions. He was broken in originally five or six years ago, and then he received some instructions, but what they were I could not say. He was taken round the works and practically taught by the supervising partner, but, as far as I am concerned, I do not know anything as to his actual instructions.
5330. Who broke him in? Mr. Snodgrass.
5331. Had he instructions to economise material as much as possible? No; there was always plenty of material.
5332. You have heard the evidence given by Dawson and Chiene having reference, to a certain extent, to the way in which Reid was causing work to be done—apparently, in your interests, saving material at the expense of good work;—what do you say to that? Personally, I know nothing of it. Moreover I do not believe it.
5333. Did you at any time know or suspect that Reid was causing work to be scamped—that he was allowing it to be scamped? No.
5334. *Mr. Smith.*] You was here the other day when Chiene was examined, and you heard what he said as to what Jack Reid had told him;—you heard him say, “He told me that Carter paid some of the inspectors”? I heard of that for the first time the other morning.
5335. Is there any truth whatever in the statement, if it were made, that you had paid any of the inspectors? There is no truth in the expression “paid”; there is no truth in the statement that the men were “paid” in the ordinary sense.
5336. Eyre, I believe, was one of the inspectors for the Government upon the particular contract referred to? Yes; he was one of them. There were half a dozen or, perhaps, seven or eight more.
5337. Did you ever make any payment to him? Never.
5338. Never in your life? Never.
5339. *Mr. Gummow.*] With regard to your paying money to inspectors, have you ever given anything at all to a man named Corpe? Yes.
5340. In what way? As a matter of charity.
5341. Was that when he was on the works, or after he had left the works? Both, I think. I should not like to say that I had not given money to him while he was on the works; he was on and off in a very bad state of health.
5342. What was the matter with him? He was dying of consumption.
5343. Did you pay his expenses to some convalescent hospital beyond Liverpool? Yes, to a convalescent home. I paid his expenses up or down—I do not know which.
5344. Did you not afterwards pay something towards his funeral expenses? Yes.
5345. Did you ever contribute to a subscription list got up by the inspectors for his benefit? Yes; I gave something to the inspectors.
5346. To what inspector was it, do you remember? No; I do not remember. It may have been Tudgay, Husband, or any of them on the Marrickville contract.
5347. You gave this money to the inspectors on Corpe’s account? Yes.
5348. Do you know if he ever got it? I could not say.
5349. Did you ever contribute to any other subscription-list got up for the inspectors? Yes.
5350. Can you remember any particular list;—can you remember any particular inspector for whom another list was made up? Yes; Tom White.
5351. What happened to him? He died.
5352. The inspectors got up a subscription list for him, to which the firm contributed? Yes.
5353. Do you remember any other subscription list to which you contributed—any other list, I mean, got up by the inspectors? I do not remember any other.
5354. You do not know of any other? There were always subscription lists knocking about the works. They were always getting up subscription lists when an inspector died or was ill, or sometimes when a man died or was ill.
5355. Almost every day lists were got up for either men or inspectors connected with the work? Yes; that is a fact.
5356. You heard Chiene’s evidence? Yes.
5357. You probably heard him say that you sent for him to go to North Shore, and that you there gave him half a sovereign, and undertook to pay his baker’s bill for three months;—did you send for him? No, I did not.
5358. That is untrue? Quite untrue.
5359. How did you happen to know that he was in a bad state if you did not send for him? I saw him with a subscription list on the Annandale contract on pay-day.
5360. For whom was the list? For himself.
5361. What did you say to him? I saw him in the yard. I had not seen him for a year or more to speak to—perhaps two years. He looked in a very bad way, and I said, “Halloa! Chiene, what are you doing here?” He said, “Well, I am very hard up, Mr. Carter. I am here with a subscription list for myself.”
5362. What did you say to that? I said I was sorry to see him hard up. I said, “I am in a hurry now. I do not like to see an old employee of ours in such straits. You had better come over to North Shore to see me.”
5363. What did you undertake to do at that time? I guaranteed his baker’s bill for three months.
5364. Did you give him half-sovereign? I think I did give him something, but I cannot think at this moment whether it was a sovereign or a half-sovereign.

- J. Carter. 5365. Then it is not a fact that you sent for him to go to you? No.  
 5366. It was merely by chance that you met him at Annandale and made this offer to him? Yes.  
 26 June, 1896. 5367. Your seeing him was not arranged or premeditated on your part? No; to tell you the truth I had forgotten his existence until I saw him at Annandale.  
 5368. With reference to Reid's first employment by you;—how did he first come to get into your employment? He was brought in by Mr. Snodgrass.  
 5369. Was he a personal friend of Mr. Snodgrass? Yes.  
 5370. It was Mr. Snodgrass who gave him a start? Yes; I had nothing to do with it.  
 5371. Did you ever hear about Reid grumbling about his pay not being large enough? No.  
 5372. Did he ever ask you for increased pay? Never.  
 5373. Did you give him a bonus or Christmas-box or anything like that? Yes; repeatedly.  
 5374. In addition to his pay? Yes; every Christmas.  
 5375. With regard to his leaving the firm;—did he leave before 79A was finished, or was that completed? It was completed.  
 5376. Do you know whether he had anything to do with No. 69? Not with the actual working of it.  
 5377. Did he make out any of the pay-sheets of No. 69? Yes.  
 5378. Was 69 completed when he left? Yes.  
 5379. Had he anything to do with Contracts 77 and 118? Nothing.  
 5380. During Mr. Reid's employment by the firm within the last two years, was I in Sydney to assist the firm in any way or was I absent? You were here about half the time. You returned to Sydney early last year, and you have been assisting the firm ever since.  
 5381. Had I any other duties to perform when I returned;—had I any other contracts to look after? Yes; there was the Adelaide work.  
 5382. Was it necessary to keep on Mr. Reid to assist us with other contracts after we had finished 79 A? No.  
 5383. Our work was sufficiently reduced in quantity to admit of one of the partners looking after it? Yes. That was the reason Reid was retrenched.  
 5384. Coming back to the pay-sheets;—did Reid make up any sheets in respect of Contracts 79 or 79 A? Yes.  
 5385. And he made them up for 65 and 69? Yes.  
 5386. Did he make them up for 77 and 118? No.  
 5387. You are given to gambling are you not? No; I am not.  
 5388. To making wagers I mean? In a small way, yes.  
 5389. Do you remember making a wager of half-a-sov. at North Shore five or six years ago in connection with some pipes which were being laid? Yes; I remember it, not from the making of it, but from the occasion.  
 5390. You paid the man;—he beat you did he not? Yes; I paid him.  
 5391. Were the pipes decently laid? I believe so.  
 5392. But don't you know it to be the fact that they were? Yes. I think Mr. Davis saw them, and complimented the man upon the way in which they had been laid.  
 5393. He was a specially good man at pipe-laying? Yes; he was what we term a champion pipe-layer.  
 5394. Before I was connected with you do you remember telling me about a splendid pipe-layer you had? Yes. It was a matter of common talk that we had the best pipe-layer in the Colony.  
 5395. You prided yourself upon having a tip-top man in that line? Yes.  
 5396. *Mr. Parkes.*] How many Government Inspectors had you on your Glebe job? There were half-a-dozen, perhaps more.  
 5397. How many were there on Contract 69? Probably the same number.  
 5398. Half-a-dozen on each? Yes. They changed about very much. They would be there perhaps two, three, or fourth, months, and then they would be sent away and someone else would take their place. I should say that the average would be four at Marrickville and perhaps five or six at the Glebe.  
 5399. *His Honor.*] Do you mean that a number of inspectors were inspecting the work at the same time? Yes.  
 5400. *Mr. Parkes.*] You said in answer to Mr. Smith that you did not pay Inspector Eyre,—that you objected to the use of the expression "paid";—what did you mean? I meant that "paid" was the wrong expression to use. I think I was referring at the time to Inspector Corpe. Mr. Smith had referred to Mr. Chiene's evidence to the effect that I had paid inspectors, and I objected to the expression "paid." I did not deny that I had given the inspectors money, because, as I have already stated, I did so; but I never paid them.  
 5401. Did you give Inspector Eyre money for any purpose? No.  
 5402. For no purpose at all? As far as I am aware he never brought a subscription list to me, although there were half-a-dozen lists out at various times.  
 5403. *His Honor.*] These lists would often be for men as well as for inspectors? Yes. The men get consumption and all sorts of things, and naturally enough they would come to us for assistance.  
 5404. You do not mean to imply that the inspectors were, as a rule, dilapidated men, who were sent on to the work to die? No; but some of them must die. A great number of men are employed, and it is a common thing on all contracts when a death or anything like that occurs for a subscription list to be got up. At least that has been my experience.  
 5405. *Mr. Gummow.*] As to guttering and gadding, are these subscriptions not in many cases for men who have been employed upon guttering and gadding work under your contracts, or on sewerage contracts? Yes.  
 5406. As a rule, are they not the men who have gone into consumption through the dust arising from their guttering and gadding work in the tunnels? Yes.  
 5407. The lists in some cases have been for men who have become diseased from that cause? Yes.  
 5408. Have you not known a number of cases in which men have died as the result of sickness arising from that cause? Yes. That is one of my grievances against the Department. I have always said that I wished to put a stop to that work.  
 5409. *His Honor.*] What is your grievance? My grievance is that the Department have tried on more than one occasion to compel contractors—to put it strongly—to murder men who have to do this tunnel work



work by ordering guttering and gadding. I have felt very strongly on the subject; in fact, I have always done so.

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5410. Did you expostulate with the Department? Yes.

5411. Will you describe the operation of guttering and gadding? I am not a practical man, but I think I understand the work in this case. Take a tunnel 3 ft. 3 in. x 2 ft. 2 in. A man would have to crouch down on his hands and knees with a short pick in one hand and with a short hammer in the other, and he is constantly battering away at the rock, cutting it away. Every blow he strikes brings out a certain quantity of dust.

5412. *Mr. Parkes.*] Is not that the case with the avocation of the ordinary stonemason? He is in the open air. In less than three months any ordinary miner would be incapacitated by working at guttering and gadding in these tunnels. The illness they contract is from the inhalation of the dust. Only this morning, on the wharf, a man asked me if I could find him light employment as he was going the way of a number of other men who had been doing the work. He told me that he had not done more than a month's guttering and gadding in his life. Nevertheless, he had contracted the disease.

5413. *His Honor.*] Do they not wear respirators? They have tried all that sort of thing, and it has been found of no use. They either can't or won't wear the things. Sometimes they are in 300 or 400 feet, guttering and gadding. Air is blown in, and the particles of dust are constantly blowing round about the face of the work. Sometimes the men are working in steamy damp atmosphere. I know at least of thirty men who have been practically killed through guttering and gadding in the Castlereagh-street job—the only contract where it was carried out.

5414. The wages you pay for that work are higher than the wages paid for ordinary blasting? Yes; the men are paid 9s. or 10s. a day. I remember that in the case of the North Shore contract, where we were asked to gutter and gad, I expostulated, and I have brought up the subject repeatedly since. I think it is a most preposterous thing that we should be asked to do that work.

5415. In deep-bedded sandstone, upon (say) Contract 79, by adopting guttering and gadding, how many feet a day could you do? It would not be feet; it would be inches.

5416. A day? Yes; that is my opinion. You must take it for what is worth. It would not be more than a foot in any case.

5417. At what rate is blasting work done? In ordinary cases, I suppose about 16 or 18 feet a week.

5418. *Mr. Gummow.*] In the cases of the men who have been injured by the guttering and gadding work, were they healthy men before they started? They have been some of the finest men in the Colony.

5419. A good stamp of men? Yes; you cannot get them now.

5420. *Mr. Parkes.*] Was not this letter sent to the Government offices by the Secretary of the Miners' Association:—

Having been requested by my Association to write to the Works Department to obtain particulars whether there is any provision made for miners being provided with air, I have done so through the Secretary of the Trades Hall, thinking it would have more effect, but up to the present it is nil.

Although we are a registered association, up to the present we are not recognised by the Board of Conciliation and of Arbitration, though we are looking forward to it, as in all probability we may be the first to use that Board, us being engaged on Government contracts, and our case is a calamity. I urge upon you to act on our behalf at once. *Re* this information, our general meeting is next Saturday, 30th instant.

My reason for being so urgent is this—our men are dying off so fast. I have to report another death no later than last Tuesday. We sent two to Victoria to benefit their health. I am expecting to hear of their death every day, as their case is hopeless. One of our members came to me to-day. He says, "This is terrible; I am dying—lingering in misery"; has not been able to work this six months; a walking skeleton. We have always a large percentage to support out of our pittance, which, God knows, is only an average of 5s. per day. Out of this our fellows subscribe manfully. We are sure our turn is not far off. There is no man following this work who can live long; we all feel the effects—a husky cough, and galloping consumption follows, and our end is not far off. When we apply to the hospital we are sent to Little Bay as incurable. We have to rush smoke and foul air and dust, and work in unnatural positions to obtain even that average wage. I have pay-sheets to prove my statements, and a glance at my books may prove a death-rate that would not be believed—that is 10 per cent.—the result of us rushing this foul air and not being able to eat during working-hours. Our wives has to nurse us and bathe our aching heads at night, as we are at times almost lunatics when we ought to be resting. Our limbs weaken, and we can no longer work. We are forced to accept this death or starve our wives and children, and we do accept death to obtain them bread. There is terrible suffering amongst our members. They are willing to work, but the work is shut down from them. Although the Works Department let the contracts, they are powerless to compel them to employ labour. The North Shore underground sewerage job, Messrs. Carter & Co., has kept their shafts idle for weeks past. Men who sunk the shafts—some as deep as 250 feet odd—has been forced to fill the ranks of the unemployed. They are actually starving us into a death price. Up to the present we have never been provided with air; what air we have had we had to provide ourselves; so hoping you will take steps on our behalf.

—? That is an utterly untrue statement.

5421. Were these men not doing blasting work? Certainly.

5422. Is it not the fact that blasting work is dangerous, and that guttering and gadding work is not so dangerous? That is not true in the least.

5423. *Mr. Gummow.*] Did you know of this letter before you saw it in the printed papers;—did you make any reply to it? Not to my knowledge.

5424. Was any action taken by the Department in connection with it? I see by the reports that the Department made an investigation, and it was found that air was being supplied.

5425. Did they discover that you were paying 5s. per day to your men? They did not.

5426. Did they discover, on the other hand, that you were paying nearly 15s.? Yes.

5427. These statements, then, are utterly untrue? Yes.

5428. *Mr. Parkes.*] In the case of sub-let contracts, have the miners to find all their own materials, tools, and everything? No; they are provided with a air-blowing plant, with tools, and with everything they require except explosives.

James Mitchell recalled and further examined:—

5429. *Mr. Parkes.*] In the return you handed in to His Honor a few days ago, there is an absence of sundry payments—I think about six of them in all; one is on 22nd January, 1892, £1,668 13s. 11d.; that was paid to Carter & Co., and is not in your list; then there is a payment on 19th February of £1,208 6s. 1d.; on 20th June, £1,681 15s. 5d.; on 21st February, 1893, of £4 19s. 10d.; on 24th March, 1896, of £100; and on 31st March, £159 17s. 5d.;—can you account for these amounts not appearing on your return? If they were advances upon the firm's contracts they should appear in the list.

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- J. Mitchell. 5430. Could you find out upon what the advances were made? Yes; the whole of the payments in this return are payments in advance.  
 26 June, 1896. 5431. But payments I suppose for any purpose whatever would appear in your accounts at the Auditor-General's Office? Yes.  
 5432. Even to a penny? Yes.  
 5433. Could an officer of the Department issue cheques upon the Government Banking account without its appearing in the Auditor-General's accounts? No.  
 5434. There is no account upon which an officer of the Department could issue cheques without the amounts appearing in your books? I do not think I am in a position to answer that.  
 5435. Supposing an officer of the Department issued a cheque upon any account—call it a contingency account—could not that item appear in the Auditor-General's accounts? It should.  
 5436. Everything in connection with the public expenditure should appear there? Yes.  
 5437. Will you take this return which you have handed in and supply us later on with an explanation concerning the amounts which are wanting? Yes.

John Reid sworn and examined:—

- J. Reid. 5438. *His Honor.*] What is your occupation? I hardly know what it is at the present time. I was a manager for Carter & Co.  
 26 June, 1886. 5439. Before that what work were you doing? I was a labourer before that.  
 5440. When did you enter into their service? As manager, about seven years ago.  
 5441. You do not remember the date upon which you went into their service? No, I can only remember that it is about seven years ago.  
 5442. Did you remain continuously in their service until you finally left? Until about three months ago.  
 5443. Receiving various rates of pay? Yes.  
 5444. Between what amounts? £2 10s. and £4 a week.  
 5445. During that time what were your duties? My duties were to carry out one contract which they had, and to make out pay-sheets for several other contracts which they had in hand at the time.  
 5446. When you say that you carried a contract out, what do you desire to convey? I had to see that the work was carried out. I was in charge of the job.  
 5447. Do you mean that you were in charge while the contractors were away—perhaps away from Sydney altogether? Yes.  
 5448. And when the contractors were about Sydney, did you always have charge of this one contract? Yes, pretty well always.  
 5449. Upon how many contracts altogether were you employed;—do you remember the number? I think on about four or five.  
 5450. What were the numbers of those contracts? I cannot remember the numbers, but I can give you the situations. One was at Woolloomooloo, one was at the Glebe, and another was at Waverley. Then there were the two contracts at North Shore, 79 and 79 A.  
 5451. Any others? No others.  
 5452. On no contract at Marrickville or Annandale? No.  
 5453. During this time what instructions were given to you as to the way in which you were to see the work done? I was given the specifications and plans, and told to carry the work out.  
 5454. In what way? According to the specification and plans.  
 5455. What were you told as to the material;—were you told to save the material as much as possible? Certainly not.  
 5456. I mean as to the gauging of the material for the concrete and the mixing of the concrete? I had no orders to that effect at all.  
 5457. To what effect do you mean? I mean with a view to save the stuff.  
 5458. I suppose you have seen the newspapers lately? I have read the reports of this Commission in the daily newspapers.  
 5459. Did you see the evidence of Dawson? I saw a report of it in the morning newspapers.  
 5460. Did you see some statements in which your name was mentioned? Yes.  
 5461. Did you see his evidence to the effect that in putting in the lining of the tunnel upon Contract 79 and 79A he left a number of defective places, some especially defective? I saw that some places were left, but I do not know about special places.  
 5462. I mean some which were more seriously defective than the others? Yes; I saw that there were bad places.  
 5463. That there were some between shafts 12 and 13? Yes.  
 5464. Were you in charge of the contract at the time that Dawson was said to have done this bad work? Yes.  
 5465. As a matter of fact the work was in some cases done in the way in which he described it? Undoubtedly.  
 5466. What do you know as to the way in which Dawson did his work; take this particular section to begin with? I always took him to be a good labourer; I always put him down as a man who would do his work properly.  
 5467. You are aware of the fact that Dawson swears that it was through your instructions to save material that he did the work in the way he did? I have heard so.  
 5468. What have you to say to that? It is a deliberate falsehood.  
 5469. Will you positively swear that you never allowed Dawson to leave these vacant spaces between the top of the drive and the brickwork; will you swear that you do not know of their having been left? I will swear that positively; I will swear that I did not know anything about it.  
 5470. Do you swear that you did not know that the material was going in in the way in which it did go in? I did not know of it.  
 5471. You did not know of it at all? I swear that I did not.  
 5472. Did you not suspect it? No.  
 5473. You know the size of the drive, because you went through it? I do not know the size of that particular part of it although I have been through it.  
 5474. You know that the drive has been 'blasted out and that consequently there will be a good deal of filling which will have to be put in between the lining and the top of the drive? Yes. 5475.

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5475. You saw a quantity of cement being used and also a quantity of metal? I did not notice particularly that part of the work, but in passing by I saw the men using the metal and cement. I could not say in what quantities.
5476. Did it not strike you that there was not the proper quantity of cement going in? No; it would take a good deal more than one man to watch that.
5477. You say you have known Dawson for some time? Yes.
5478. For how long? He has worked for the firm for several years—for the last four years.
5479. Have you ever had occasion to question the way in which he did his work? Never on any occasion.
5480. There was a man named Hansen working there at the same time? Yes.
5481. You know that his work was questioned by the inspector on one occasion? Yes.
5482. Had you had occasion to find fault with Hansen's work before then? Not before then.
5483. Do you not know that his work was found fault with on one or two occasions before the occasion on which he was dismissed? No, it was never reported to me.
5484. Did you know nothing at all about it? Not a word.
5485. Do you swear positively that you had no idea whatever that bad work was being done? None whatever.
5486. Where were you living at the time? I was living in Sutherland-street, North Sydney, at the time.
5487. What would you be doing during the time work was going on;—how would you be employed? There was a good deal of work going on on the job. There was the concrete work and the plastering work. I had to see that all the work was being properly carried out.
5488. What length of work had you under your charge? About 60 chains, I think.
5489. What you specially had under your charge was the lining? No; the whole job was under my charge.
5490. What object would Dawson have in leaving these vacant places? I can only think that he did it for laziness sake.
5491. Dawson swears that you, being the contractors' manager, actually gave him instructions to do the work in the way in which he says he did it? That is not true.
5492. You swear that it is not true? I swear that it is not true.
5493. Do you remember giving him any particular instructions? No; I cannot say that I do. He came to me as an expert labourer in that particular class of work.
5494. As a bricklayer's labourer? Yes.
5495. And you employed him? Yes.
5496. How much a day did he get? He was getting 9s. a day at first, and 8s. a day latterly.
5497. When was he reduced to 8s. a day? He went to a job at Marrickville and he got 8s. a day there.
5498. Was he getting 9s. upon Contract 79? Yes.
5499. Right through? Right through until he came back from Marrickville, and then I paid him at the rate at which he had been paid at Marrickville.
5500. What did he say to the reduction of a shilling in his pay? He made no comment to me.
5501. He did not grumble about it? I never heard of it.
5502. Connors, the bricklayer, was employed there at the same time? Yes; on Contract 79.
5503. I suppose that whatever work the bricklayer's labourer did in the way of bad filling the bricklayer would be aware of it? Not necessarily. While the labourer would be packing the bricklayer would be below pointing up his work.
5504. He would be inside the tunnel? Yes.
5505. So that it is quite possible that the labourer might leave an open space without the bricklayer knowing of it? Yes; he might scamp his work, and then put a face on it and make the drive look as though it had been properly packed.
5506. Did you ever find Dawson a lazy man? No, or he would not have been there.
5507. He was off for some time, was he not? For about a fortnight.
5508. What was the cause of it? We were short of bricks at that time.
5509. Was that the only reason? The only reason.
5510. You are aware that Dawson, with another man, was once reported by Inspector Reid for putting in, or seeming to put in, dry metal into the packing of a shaft? No, I am not aware of that.
5511. Did you not hear something about it? Never.
5512. You heard of it lately? No. But I think I saw something of it in Reid's evidence. I saw something about dry metal going down one of the shafts, but I could not understand it.
5513. Have you not heard that Inspector Reid founded one of his complaints on the fact that he had discovered Dawson and another man putting down dry metal, or that he thought he had? I have never heard of it.
5514. You heard that Reid reported the men on some occasions for improper work? I think it was the manner of doing it that he found fault with, not the quality of the material.
5515. What do you mean by the manner of doing it? I mean the mode of carrying the work out, the mode of doing it. I fancy that was the cause of his complaint more than the quality of the work.
5516. What mode of doing it would that be? I mean the mode in which the work was done. It might be the mixing of the concrete or it might be something else.
5517. One of his complaints was that the concrete was mixed too soon, was it not? Possibly he may have made that complaint.
5518. Do you know anything about it? I believe at one time he did complain about the concrete being mixed before it was to be used.
5519. How came that to be done? I could not say. The men had to perform certain work and I suppose they did it as best they could.
5520. What instructions did you give as to the mixing of the concrete? Possibly I said that they were to mix it as best they could, but I forget now.
5521. You are aware, are you not, that concrete ought to be mixed not more than a certain time before it is used? Yes; it has to be wet only a certain time before it is used.
5522. It may be mixed dry sometime beforehand? Yes.
5523. But if the sand were wet, of course that would damp it? Yes; and in that case the cement might set.
5524. In that case it ought not to be mixed until immediately before it is required? That is so your Honor.

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5525. He complained, did he not, that wet sand was used? I do not remember his complaint now. He made so many complaints.
5526. What sort of man was he with regard to the way in which he carried out his duties of inspection? I would rather not say anything about Reid.
5527. But I want you to do so;—what was your experience of him? I think he is a very objectionable man.
5528. Did you find him an honest man? I believe he was.
5529. Then in what sense was he objectionable? I mean the objectionable manner in which he made the men do the work.
5530. Do you mean his tone of voice, or what? I mean his tone of voice and his manner of doing it generally. He was always at variance with the labourers. I saw very little of the man myself; he was mostly down below. He and the labourers were always quarrelling.
5531. Dawson on several occasions gave the same evidence—that is, that the instructions upon which he acted were given by you, and that that is the reason why he scamped his work;—he swore that he did so for the sake of saving material, and that he acted upon your instructions? That is entirely false.
5532. Entirely false, you say? Yes.
5533. Did you hear at any time talk among the men as to Dawson's having said something about the way in which the work was done? I did hear it, but I did not believe it.
5534. When was that? Possibly six or seven months ago.
5535. Not before that? No.
5536. That would be early this year? Early this year, or the end of last year—I could not say which.
5537. What was it you heard? I heard that he had made a threat that if he was not paid for the time he was idle he would put the Company away.
5538. What time was that during which he was idle? The fortnight I have spoken of.
5539. Had he, then, been making any demand upon you? No.
- 5540-1. He made no demand upon the Company to be paid during that time? He never made any demand that I know of. I heard the statement made about him, but I did not put any reliance on it. I did not believe it.
- 5542-3. From whom did you hear this threat? I could not say now. I heard it from two or three people on the job—from a labourer amongst others, I think.
5544. Do you remember the names of any of the men from whom you heard it? I do not think I could now; the matter left so little impression on my mind that I really forget who told me.
5545. It would be quite an unreasonable demand that he should be paid for that fortnight? I should think so.
5546. But from the style of the man—from the way in which he spoke to you—do you think it likely that he would make such a demand? I do not.
5547. I wish you could remember the Christian name or surname of any man who said that he had heard Dawson making this threat? I could give you the name of one man—James Connors, the brick-layer.
5548. Where is he now? I do not know.
5549. Is he employed by the Company? He has not been employed by them for some time.
5550. When were you told—was it before or after he had left the work that you were told this? He was not working for the firm at the time that that took place.
5551. You mean at the time he said something to you about Dawson's threat? Yes.
5552. Have you no idea where Connors is to be found? I daresay you could find him in Marrickville somewhere.
5553. You yourself had a difference with Inspector Reid—one particular difference, had you not? I never had.
5554. Do you not remember his reporting you? He may have reported me, but I had no difference with him. I do not think I spoke to him more than twice on the contract.
5555. He said he reported you because you had come to him at No. 5 shaft and had told him to tell the inspector-in-charge that you did not intend to pack any of the shafts till they were finished;—do you remember some threat, or, indeed, saying anything which he may have construed into a threat of that kind? I do not remember now, but it is possible that I may have said it.
5556. If you said such a thing, how would it come about? Probably I meant it.
5557. But how could you pack the shaft after it had been finished? Easily. There is always a certain amount of space left between the brickwork and the ground.
5558. But supposing the shaft were from 80 to 100 feet in depth, it could not be done then, could it? It could be done, but, of course, it could not be done so well.
5559. Then did you say what you did by way of a joke? I could not have said it in earnest.
5560. Then you must have been chaffing Reid? That is possibly the case. I do not remember chaffing him. If he says I said it I will not say that I did not. As a matter of fact, the shafts were packed as they came up.
5561. That was the only practicable way of doing the work? It was the only way in which they could possibly do it honestly.
5562. If you said this thing either in a joke or in earnest there might have been some grumbling on the part of Reid? There may have been. There is not an inspector who does not grumble sometimes.
5563. And you say that Reid was a very difficult man to get on with? A very difficult man.
5564. You took Hansen off Contract 79A? Yes; I dismissed him.
5565. Because Inspector Andrew complained that he was not packing properly? Yes; and I dismissed him in consequence.
5566. Was he not taken straight on to Contract 69? I do not know.
5567. Had you anything to do with Contract 69? Nothing at all.
5568. All that you know is that you dismissed this man from Contract 79A? Yes.
5569. Did you send him away with a letter? Yes; I gave him a note for his money, and told him I dismissed him.
5570. To whom was the note given? To one of the contractors who was always on that contract.
5571. And you know nothing as to what afterwards happened to Hansen? No.

5572. Do you remember an occurrence in Mr. Chiene's presence when you opened a parcel containing a spirit-stand, a present for Mr. O'Hanlon? No.
5573. Do you remember something about a present from Mr. Carter to Mr. O'Hanlon when Mr. O'Hanlon was about to be married? I do not remember that. I remember when Mr. O'Hanlon was married, but I do not remember the present.
5574. Do you not remember a brown paper parcel being left at the office, and your being told by Chiene that this parcel was to be delivered to Mr. O'Hanlon? Do you remember opening the parcel, and looking inside to see what it contained, and afterwards making some remark about it? Certainly not.
5575. Are you sure of it? I have no recollection whatever of the occurrence. I certainly did not open any parcel.
5576. This is alleged to have taken place I understand at the office at St. John's Road at the Glebe? That would be many years ago.
5577. Do you remember Mr. O'Hanlon getting married? Yes.
5578. Do you not remember a wedding present being given to him by Mr. Carter, who is a liberal sort of man,—do you not remember something being given by Mr. Carter to Mr. O'Hanlon merely as a wedding present? I know nothing about it. It may have taken place, but it is six years ago since the thing happened.
5579. You have had a good many conversations at different times with Chiene? Yes.
5580. He swore positively that you had told him that many of the inspectors were being paid by the firm. What do you say to that? It is an untruth.
5581. Have you said anything similar to that to him? No, never.
5582. Nothing at all? No.
5583. You have heard of inspectors getting presents from members of the firm, have you not? No, never.
5584. No presents of any kind? No; I know nothing of them.
5585. Don't you remember taking down one of the pay-sheets and showing the name of an inspector, or the names of inspectors, as having received payments from the firm? No; I do not. That never occurred.
5586. Do you not remember showing more particularly the name of Inspector Corpe? No, not Inspector Corpe. There may have been Corpe's name.
5587. Who was Corpe then who was not an inspector? They are one and the same man, but he was dismissed the service through inability to attend to his duties.
5588. After he was dismissed what occurred? Several times Mr. Carter helped him financially.
5589. Did you, in point of fact, mention to Chiene that Corpe, after he had been dismissed, had been helped by Mr. Carter? Possibly; but I do not remember.
5590. Do you swear that during the time he was an inspector he was not to your knowledge helped by Mr. Carter? Not to my knowledge at any time.
5591. Do you know a man named Martin Byrnes? Yes.
5592. He was employed on what contracts? On many contracts I have been on.
5593. Do you remember a certain conversation taking place between Chiene, Martin Byrnes, and yourself, when something was said as to putting mullock in to help to pack before the concrete was put in? No; I do not.
5594. Are you aware of bad packing having been done where concrete ought to have been used. Are you aware of various kinds of rubbish being put in in place of concrete? No, I am not.
5595. Will you swear that that never occurred? It never did to my knowledge.
5596. You remember a man named Goddard who was employed by the firm? There are two men of the name of Goddard—one was employed at the Glebe and the other was employed at North Shore I think.
5597. You know the man Goddard who was employed at the Glebe? Yes.
5598. Do you remember mentioning to Chiene that Goddard had marked certain places in which shale had been put in, or in which something which ought not to have been put in had been put in in order to fill up places which should have been properly packed? I do not.
5599. You do not remember anything of the kind? Nothing of the kind ever occurred to my knowledge.
5600. One of the inspectors was named Gledhill, I believe? Yes.
5601. Was he an inspector at the Glebe contract? Yes.
5602. Can you identify in your mind No. 9 shaft at the head of Mitchell's Road? Yes.
5603. Do you remember Inspector Gledhill giving instructions that No. 9 shaft should not be filled until he was present? No.
5604. Are you sure that did not occur? It was not about that shaft at all.
5605. Did he give instructions as to some other shaft? No, not instructions.
5606. Then what did you mean just now by saying that it was not about that shaft? The shaft referred to is another shaft altogether I think—shaft No. 7.
5607. As to shaft No. 7 what occurred? It is the only shaft I can remember anything about. It was arranged between us that the centering should remain a certain time in the shaft before being drawn, and that as soon as that time arrived it should be drawn and the shaft filled in. Gledhill came up and said that the centering was out before the proper time, and we had a bit of a barney.
5608. Did he say that the centering ought not to have been drawn before he came? No. What he said was that it ought not to have been drawn until a certain time had elapsed.
5609. He said that the proper time had not elapsed? He did at the time, but he afterwards apologised.
5610. Was the filling done before the centering was drawn or afterwards? Afterwards.
5611. What state was the filling in when Gledhill came there? I do not suppose it had been filled at all when he came.
5612. Did not Gledhill complain on some occasion that the filling ought not to have been done until he turned up? Never.
5613. Was not a certain shaft filled in early in the morning before Gledhill came—whether it ought to have been done then or not? No work was carried out before 7.30 in the morning at any time.
5614. Do you swear that the only occasion when Gledhill made any complaint as to the shaft was when he said that the centering had not been allowed to stand long enough? Yes; he made a mistake as to the time.
5615. With regard to Martin Byrnes, perhaps you will remember what took place if I remind you of a certain

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certain expression which he used when he was told to get the mullock put in as soon as possible in a certain place;—do you remember his saying that if he were caught he would be hanged for it, and he added, “all right, I will be hanged for it; you clear out and keep the inspector away”? Not one word of it.

5616. Will you swear that nothing of that kind occurred? I swear it.

5617. Then I suppose Chiene must have been mistaken? I cannot help that.

5618. At any rate, you say there is no truth in the statement? I never allowed a man to do bad work in my life.

5619. As to truthfulness, what sort of man did you find Chiene? I have always found him truthful.

5620. Had he any quarrel with the contractors, or with the men at the works? Not to my knowledge.

5620½. As far as you know he had none? Not that I know of.

5621. You know that he was very kindly treated by the firm after he left? I do indeed.

5622. Do you remember a cask of cement being kept at the office at the Glebe for some purpose? No.

5623. Was there no cask of cement in the office at all? The office was too small for it?

5624. What would be the size of it? It was only a contractor's office—about 8 ft. x 10 ft.

5625. A cask of cement would take up only a small space under the desk? Yes, but there would be a table there, and also a drawing-table. If the cask was there, I never saw it. There was no cask of cement in the office, anyhow.

5626. Did you not show Chiene on one occasion a cask of cement in one of the offices? Certainly, I did not.

5627. Will you swear that you did not draw his attention to a cask of cement which was being kept there? No, I never in my life saw a cask of cement in the office.

5628. You are quite sure of that? I am certain of it.

5629. Then if Chiene swears that what might be called a sample cask of cement was kept there for the special purpose of taking samples out it would not be true? You mean for test purposes—that is entirely untrue.

5630. How was the testing carried out when the cement had to be tested? When the officials wanted a test taken they came and took the cement themselves out of the cask. There was generally a number of casks out in the shed.

5631. How are the heads of cement casks fixed on? With nails driven through a hooped ring on the top of the cask.

5632. If you once open a cask can you nail it up in such a way as to make it look as if it had never been opened? No, once you open it, it will show,

5633. Is the hoop put there for the purpose of keeping the head down? Yes. It is a wooden hoop.

5634. Nailed with wire nails on to the staves of the cask? Yes.

5635. Chiene has sworn that you showed him a cask of cement and told him that that cask was used for taking tests—that all the tests were taken out of it? That could not possibly be. The Government officials take their own tests from any cask they like to select out of those that are in the shed. There might possibly be a thousand casks there. What Chiene said, therefore, could not be true.

5636. *Mr. Smith.*] With regard to that little matter about the wedding present;—do you remember Chiene telling you that a parcel had come for O'Hanlon? I cannot remember it at all. It may have been so.

5637. Cannot you remember tearing open the parcel and looking at it? No, I do not remember that.

5638. When you saw what was inside it do you remember saying, “I do not begrudge him it because he has done the firm some service at North Shore”? Certainly not.

5639. You do not remember that at all? No.

5640. Did you ever boast to Chiene that bad work was done at all upon Contract 65? No.

5641. And that you dodged the inspectors? Never in my life.

5642. Did you ever say such a thing in chaff? Certainly not.

5643. Did you ever tell Chiene that Inspector Eyre wanted to see Mr. Carter, and did Chiene ask you what for, and did you say, “Carter is as good as 30s. a week to him”? No, certainly not.

5644. *Mr. Gummow.*] Before your employment with Carter & Co. what were you? I was labouring for some other firm.

5645. Were you always a labourer? No.

5646. You are an educated man? I am slightly educated.

5647. Do you consider that you are educated above the level of an ordinary labourer? Yes.

5648. Were you capable of making out pay-sheets before you started with Carter & Co.? I think so—yes.

5649. You were employed by Carter & Co. through whom? Through Mr. Snodgrass.

5650. Were you a personal friend of Mr. Snodgrass? Yes.

5651. Did you get your employment with the firm through personal friendship or through your ability as a manager? Through friendship in this case.

5652. As well as getting your pay with Carter & Co., did you learn your business as a manager? I think so.

5653. And in consequence you are more capable of doing your work than you were when you started with them seven years ago? Yes.

5654. Did you consider £2 10s. a week sufficient remuneration for you when you first started? I think so. I was quite satisfied.

5655. Did you ever ask for an increase in salary? Never in my life.

5656. Did you ever get any increases without asking for them? Yes.

5657. Did you ever get bonuses? Frequently.

5658. When you left the employ of the firm was it a sudden dismissal? I knew of it six months before I left.

5659. Who told you of your having to go? Mr. Carter himself, several times.

5660. Did Mr. Carter dismiss you finally? No, I left myself.

5661. Why did you leave yourself? The work had gone down to such a narrow point that I could not stay any longer.

5662. You were ashamed of drawing your pay and not doing any work? I was.

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5663. Did Mr. Carter give you anything at that time? He gave me a bonus of £10 when I left.
5664. And yet you say you had been employed by the firm for about six months with very little to do? That was not my fault.
5665. You had no reason to complain of the contractors' action in dismissing you—in letting you go at that time? Certainly not.
5666. When you were employed upon Contract 79 and 79A, had you plenty of material to hand? Any quantity.
5667. When material was wanted for a shaft, what action was taken to secure the supply of it? A carter was told off to see that material was supplied constantly.
5668. Did you take any sections at all on 79A? No.
5669. Could you tell by gauging the length of the tunnel between the shafts how much sandstone concrete would be required? No; I took no sections.
5670. You could not tell by the length of the work how much sandstone concrete it would take? No, I could not tell.
5671. Did you ever shout for the men upon Contract 79A? Frequently.
5672. With what object? I do not know that I had any object in view.
5673. Did you want a drink now and then? Sometimes.
5674. Did you generally go in by yourself to have a drink? I did not.
5675. Did the men ever shout for you? Yes.
5676. Did Dawson ever shout for you? Yes.
5677. Do you remember the last time you were drinking together? Yes; the day he left the contract.
5678. Do you remember what occurred? They drank my health with musical honors.
5679. He did not refer to any bad work at that time, did he? No.
5680. Did he appear to be quite satisfied when he left? He left perfectly satisfied as far as I knew at the time.
5681. In the carrying out of Contract 79A, did the contractors interfere with you in any way in the carrying out of your duties? No.
5682. You had an absolutely free hand? Yes.
5683. You said that you paid Dawson 9s. at one time, and that he was afterwards paid 8s.? Yes.
5684. What was the reason for the reduction? When he went to Marrickville he went under some of the contractors, and seeing that they only paid him 8s. I did not see why, when he returned to us, I should raise his wages again. The other people gave him 8s., and I simply followed them.
5685. You have said that you heard Dawson had said that bad work was done—that he had left some bad work, and that he had made some threat about giving the Company away? Yes; he said he would put the Company away. Those are the words I heard.
5686. Did he ever come to you for blackmail? Never.
5687. He was off the job for nearly a fortnight you say? Yes.
5688. Did he ask for full pay for that fortnight? No.
5689. When you heard of this bad work was the contract still in the Company's hands? Yes.
5690. Could the Company have got this work put right if they had thought it was there? Very easily.
5691. With regard to Inspector Reid, in what way did he carry out his duties in looking after the work—did he speak openly on any subject concerning which he had a grievance—did he speak openly to you and to the men? He never spoke openly. His manner of making a complaint was very offensive.
5692. Do you know if he used to stand openly by the board when concrete was being mixed? I know he did not. I have frequently seen him go behind a tree in the park at night-time and watch the men from a distance.
5693. Did he act as an inspector or as a detective? He acted as a detective, not as an inspector.
5694. As to this spirit-stand, you say you do not remember anything about it? Not a word.
5695. You are quite sure you cannot? Certainly.
5696. As to Goddard, what was he on the job? A miner.
5697. Had he anything to do with the concrete, or with the putting in of the concrete? Nothing at all.
5698. Do you remember when he got paid off? Yes.
5699. Do you remember telling Chiene that Mr. Carter wanted to square Goddard? No, I never did.
5700. What do you remember in connection with his being paid off? We had a dispute as to his final pay; I refused to sanction it.
5701. Do you know what action was taken by Mr. Carter? I know he paid the money after a while.
5702. The money you refused to sanction the payment of? Yes.
5703. Do you know whether Goddard had taken out a summons against Mr. Carter? I do not recollect.
5704. If he had taken out a summons, what would it be for? For the amount of his wages, I presume.
5705. Do you think Mr. Carter was likely to pay the man the wages he claimed on the strength of the summons? I think the matter in dispute was very slight.
5706. Knowing Mr. Carter as you do, can you say whether he would prefer to pay or be bothered about going to Court? He would pay it.
5707. Do you remember Chiene meeting with an accident? Very well.
5708. You remember his coming back to work after the accident? I do.
5709. Do you consider Chiene was in as good a state of mind and body after the accident as he was before it? Not by a long way.
5710. What state was he in afterwards? He got very childish.
5711. Did he recover? He did after a while—slightly.
5712. Have you seen him lately? I have.
5713. Do you consider that he is all right now? I do not.
5714. Were you afraid to let him go down the shafts? At the Glebe—yes.
5715. What were you afraid of? I was afraid that he might fall.
5716. He was very shaky? Very shaky.
5717. As to this cask of cement;—do you know how cement is put into casks, or have you heard how it is put in? I know it is pressed in tightly, but I do not remember in what way.
5718. Could you by any means press it into the cask as tightly as it is put in in the first place, if the cask were disturbed? Not by any means.



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5719. If a cask had been opened and partially used, could you fill it up again to the same state as before? I could not.
5720. Could you tell me whether an inspector takes cement for testing purposes from the top of the cask, from the centre, or from the bottom? From the three places as a rule—first from the top, then about the middle of the cask, and then from the bottom.
5721. So that he would get a fair sample? Yes.
5722. Would he be likely to take a sample out of one cask only when there were about 500 casks in the shed? No, he would take a number of samples in proportion to the number of casks in the shed.
5723. Am I to understand then that he would take samples out of a number of casks? Yes.
5724. Had you anything to do with that business? No.
5725. Had the contractors anything to do with it? Not to my knowledge.
5726. Have you ever seen them interfere in such matters? No.
5727. Did you interfere at all? Never in my life. The Department sent their own men, who took their own tests.
5728. *Mr. Parkes.*] Dawson was employed for how many years do you say? Possibly, four.
5729. For only four? I could not say for how many more, but for four years to my knowledge.
5730. During the time he was employed had he not many breaks in his labour? Very likely he would have.
5731. Did he ever make a complaint about these breaks and demand some money in consideration of them? No.
5732. Did he not demand money on those occasions? Not to me.
5733. What contract was Mr. O'Hanlon on? I could not say.
5734. Do you know him? Yes, well.
5735. Did you ever work under him? No; with the exception of a day or so at North Shore. He relieved the resident engineer and laid off a couple of shafts.
5736. On what contract was that? No. 79.
5737. How long was he there do you say? Two days, I think.
5738. How long were you working on that job? Four years.
5739. Was two days the whole of the time he was there? Yes, in my knowledge.
5740. When you three men were at the shaft—Byrnes, yourself, and Chiene—do you recollect a conversation taking place? I do not recollect the conversation you refer to, and I do not believe it took place either.
5741. You were at the shaft together? We were on the contract together. I do not know what shaft you refer to.
5742. Do you remember standing at shaft No. 7 with those men? It is very likely we were there, but I do not remember it.
5743. You are sure you had no conversation there with these men—you are sure you were never there? That I could not say.
5744. Tax your memory please? I could not remember where I was on a particular day six years ago.
5745. Your memory is not good as to what occurred six years ago? No.
5746. You could not rely on your memory to that extent? Not in regard to little things like that.
5747. On what date did Inspector Corpe leave your job at the Glebe? I could not say.
5748. Can you not remember the date he left? No.
5749. Was the job nearly completed? I could not say. One inspector would not be there from start to finish. The inspectors are shifted about as the Department thinks fit.
5750. When did Corpe die? I could not say. Possibly three or four years ago.
5751. At what time was the contract at the Glebe completed? About five or six years ago.
5752. He died after that? I think so.
5753. With regard to the building of shafts, sometimes the brickwork touches the sides as it comes up owing to the irregularity of the excavations? Yes; sometimes.
5754. There is no regular face? No.
5755. In some cases if the concrete is tipped in at the side there will be a considerable saving? Yes.
5756. You know Goddard well? I do not know him well.
5757. You have often had conversations with him? I do not believe I have had more with him than with other men on the works.
5758. Will you swear that Goddard did not do bad work near to shafts Nos. 12 and 13? He was a miner. He could not do bad work.
5759. Did he never mix any concrete? Not to my knowledge—never under me.
5760. Will you swear that he did not mark the bad work? I remember marking some of his work as bad? I would not pass it.
5761. What was the nature of it? The drive, when finished, was found to be too tight in places.
5762. Will you swear that he did not mark the face of the sewer to show where there was bad work? Not that I know of.
5763. Will you swear that he did not tell you so? I will swear that. He was a miner, not a concreter.
5764. But he could mark the places where he knew the bad work existed, I suppose? Certainly he could, if he liked.
5765. Will you tell me the name of the man who told you that Dawson had said that he was going to put the contractors away? Yes; Connors.
5766. Will you tell me the name of any other man who told you that Dawson had said this thing? I cannot remember any other names just now.
5767. You said that Dawson could do bad work without Connors the bricklayer knowing it, did you not? Certainly he could.
5768. How long would it take a bricklayer to build a succession of drums 14 feet in length? I could not say. I never timed them.
5769. Would it take half a day? No.
5770. How long would it take them? A good man could do eight drums a day.
5771. It would take some hours? Yes.
5772. What would Connors be doing during the time Dawson would be leaving the space open? He would be pointing his work up and cleaning it down. 5773.

5773. Will you describe how the packing is done? It is put in with a shovel over the brickwork and then rammed with a rammer until tight. J. Reid.
5774. Does not one man supply the material while the other does the work? No; a man supplies that from the top. 26 June, 1896.
5775. But is not one man down below fetching the material to the other? No.
5776. If a bricklayer is going along with the work, the man who is doing the packing would be in close association with him, would he not? Yes; but you can't be laying bricks while another man is packing.
5777. But the bricklayer must observe the man who is packing, must he not;—he must do so from the narrow space in the tunnel? Yes.
5778. He could not possibly make a mistake, could he, without being observed—the man who was packing? No; if any spaces were left open, of course the other man could see them.
5779. Then Connors could not make a mistake in saying that Dawson had done bad work? There can be no doubt about it at all. There are cases, of course, where a bricklayer would build more than two drums at a time in the case of big work.
5780. *His Honor.*] How many drums back could a man pack? Three drums, comfortably.
5781. What length is a drum? Two feet 6 inches.
5782. *Mr. Parkes.*] What would be the length of the rammer? It would be as long as required.
5783. Could he properly pack back three drums? Yes, comfortably in big ground. Of course, I do not mean in small ground.
5784. Were the pay-sheets of Carter & Co. signed when the payments were made? No, never.
5785. You made up these pay-sheets? Yes.
5786. What was the date of the pay-sheet upon which Corpe's £1 appeared? I could not tell you, within a year.
5787. How long was it that he left before the contract at the Glebe ceased? I could not say.
5788. Would it be a month before? I could not say.
5789. Would it be two months before? I could not say for certain if his name ever appeared on the pay-sheets.
5790. You said, I thought, that his name did appear? We gave him money I know.
5791. While he was an inspector? No; while he was ill.
5792. Was he an inspector then? No; he was discharged through illness at the time I refer to.
5793. You know Inspector Fowle? Yes.
5794. Did he make an inquiry concerning your dispute with Inspector Reid? I do not know that he did.
5795. Did he report in regard to it? I do not know that he did.
5796. What was it that you said to Reid exactly? I could not say.
5797. I mean about the filling of the shaft? I cannot tell you what I said to him, because I do not remember any conversation at all with him. I do not think I spoke to Reid twice upon the contract.
5798. Is it not the custom of tradesmen who supply various materials to contractors to send a cask of cement to the contractor—either to the contractors or their manager? I do not quite understand you.
5799. Is it not the practice of merchants to send a cask of cement to contractors as a sample? It is not. I never saw it done, anyhow.
5800. Will you give me the names of some of the men who worked on the Glebe job, who did the concrete periphery or any portion of it? Well, there were Martin Byrnes and Labrees.
5801. Can you tell me of any more? I cannot think of their names just now.
5802. Do you recollect whether Inspector Norby was on that job? I cannot remember. I do not remember the name.
5803. Was there not such an inspector there? I do not remember that there was. He was not there for long at any rate.
5804. Did you not on one occasion say to Inspector Fowle that you had mixed concrete just as it suited yourself? Very likely.
5805. How did that occur? I cannot say now. It is very likely that I did say it.
5806. Was it not Inspector Fowle who found fault with your work? I cannot say that he ever found fault with my work.
5807. How did this conversation come up? I could not tell you these things now for my life.
5808. How long ago is it since you were on Contract 79? Three and a half years ago.
5809. You cannot recollect three and a half years ago? Not a conversation which took place then.
5810. Then, how is it that you are able to give such definite replies in regard to other matters which happened then? They impressed themselves on my memory, I suppose.
5811. What I am referring to happened about two years ago; you seem to have a very clear memory for things which it is convenient to remember, but a very cloudy memory for things which it is inconvenient to remember; surely you remember a quarrel which took place two years ago? It was not a quarrel, I think.
5812. You had some words with Inspector Fowle, finding fault with your work;—do you not remember Inspector Fowle reporting as to the difficulty he had in getting Carter & Co.'s men to do their work properly? I do not.
5813. *Mr. Gummow.*] With regard to Mr. O'Hanlon, you say that you saw him two days on Contract 79? Yes.
5814. Did you ever see him in any of Carter & Co.'s offices? I saw him once in Carter & Co.'s office at the Glebe.
5815. What was he doing there? He was there with an engineer from a neighbouring contract.
5816. What was he doing? I think he was giving them some lines.
5817. You had conversations daily with workmen, I suppose? Yes.
5818. Can you remember all these conversations? I cannot.
5819. Did you have "barneys" with them, as you term it? Frequently.
5820. Did you have frequent "barneys" with the inspectors? Yes.
5821. Can you tell me how many inspectors there were altogether upon Contract 79? At one time there were seven there, I think.
5822. Can you remember whether it was not the case that at one time you had there nearly as many inspectors as you had men? We had seven there, I think, at one time.

- J. Reid.  
26 Jan., 1896.
5823. What were their duties do you remember? I suppose they were there to watch the work which was being carried on on the contract.
5824. What work were the contractors doing at that time? Bricklaying, packing, and rendering—the usual work.
5825. Were any inspectors looking after the blasting? The blasting was all finished at that time.
5826. Where were you when the blasting was going on? On the contract.
5827. Was there no inspector there while the blasting was going on? Yes.
5828. Do you remember whether you were blasting or cutting out? Blasting.
5829. Do you remember what the inspector's duties were when you were blasting? Yes; to see that we kept in a proper centre, and that we did not use an excessive amount of powder.
5830. Did not the inspectors look after their duties very carefully in the matter of blasting? Yes; I think they did all through on that job.
5831. As to these shafts at North Shore and a conversation which you are supposed to have had with one of the inspectors as to the filling up of the shafts when they were finished. Will you describe to His Honor how the shafts are built. I think there must be some misunderstanding on this point. Are not the shafts built up close to the rock? In some cases.
5832. In other cases are they not built up with a good space left between the rock and the brickwork? Yes; 2 feet round sometimes.
5833. With what do you fill in that 2 feet? Rock filling.
5834. Not concrete? No.
5835. Is it likely, in reference to this conversation you are supposed to have had, that it was in regard to a shaft of this description when there would be 2 feet round the chimney stack, as we term it? I could not say, I am sure.
5836. But you are sure there are two ways of building shafts? Yes.
5837. One close against the rock? Yes; we put concrete in in that case.
5838. And in the other case when you build a chimney-stack you fill in the space round it with rock? Yes.
5839. You said that the bricklayer could see whether Dawson was doing his work properly? Yes; if there were a space of 14 feet he ought to have seen it.
5840. The bricklayer, you say, would be pointing during the progress of the packing by the labourer? Yes.
5841. The labourer, therefore, would be working above him? Naturally.
5842. If the labourer put up a face of concrete, and the bricklayer had no suspicion of bad work being done, could he tell whether the space behind the face was packed? Certainly not.
5843. You are sure of that? Yes.
5844. *Mr. Smith.*] You have seen the men, I suppose, doing tunnel-work with a gad, as it is called? Yes.
5845. What is the effect upon them, as regards their health? I could not say how it affects them, but men who follow the occupation closely do not live many years.
5846. What is their illness attributed to? The men themselves attribute it to the dust getting into their lungs.
5847. Does the same thing happen when they do their work by blasting? Not nearly to so great an extent as when guttering and gadding is done.
5848. Do not the fumes of the powder affect them? No; I never heard of any sickness being contracted through the fumes of the powder.
5849. *Mr. Gummow.*] As to the question of pay-sheets, you say that you have made out most of them? Yes, for years.
5850. Upon what contracts have you made out pay-sheets? There is only one I have never touched and that is the Balmain contract at present in operation.
5851. Are there not two contracts at Balmain? Yes; but there is only one office.
5852. Do you do most of the clerical work of the firm? Yes.
5853. Have you ever kept any books for the firm? No.
5854. Do you know of any having been kept? No, I do not.
5855. Have you ever seen any? I never saw a book in the offices.
5856. Referring to Chiene, do you remember his asking Mr. Carter for £100? Yes.
5857. For what purpose did he want it? A tote I think; I believe he wanted to run a tote.
5858. Did Mr. Carter give him the money? He gave him £20.
5859. To run a tote? I do not know. I left the office when the question arose.
5860. *Mr. Parkes.*] How long ago is that? Three or four years ago.
5861. You seem to have a wonderful memory for that? It was the idea of running the tote which impressed the thing on my memory.
5862. *Mr. Gummow.*] Mr. Parkes says you have an extraordinary memory for some things;—can you tell us how long ago it is since you saw me? I saw you this morning, and I saw you yesterday.
5863. Did you see me accidentally yesterday? Yes.
5864. Did I speak to you? Yes.
5865. Did I ask you any questions about this Commission? We spoke generally about the Commission.
5866. Did I say anything to you about Chiene's evidence? Not a word.
5867. Did you have lunch with me? Yes.
5868. We spoke generally about contracts? Yes.
5869. Did I ask you for any information as to the Glebe contract? No, not at all.
5870. *Mr. Parkes.*] You are sure that Mr. Gummow did not yesterday refer to any matters concerning which you have been asked questions to-day? We talked of matters generally, but of nothing specifically.
5871. Did not Mr. Gummow refer to any matter connected with conversations between Chiene and yourself? No; he did not.
5872. How long prior to yesterday was it since you saw Mr. Carter or Mr. Gummow? I saw Mr. Carter, I think, one day last week.
5873. Did you speak about this matter? No, we did not. I do not know when I last saw Mr. Gummow, I see him frequently.
5874. Where did you meet him yesterday? Somewhere in the Pymont Bridge Road.
5875. Where do you live? At Waverley.
5876. Where does Mr. Gummow live? At Ashfield, I think.

5877. In what part of the Pymont Bridge Road did you meet him? I could not say in what part.  
 5878. Near what street? Near the Glebe-road.  
 5879. But surely you cannot forget the street near which you met him? It was somewhere near the tram line or near the Glebe-road. That is all I recollect.  
 5880. At what time did you meet him? At about 11 o'clock.  
 5881. What were you doing out there? I was going out to the contract.  
 5882. To Carter, Gummow, & Co.'s contract? Yes.  
 5883. Do you expect to get on to one of their contracts again soon? No; but I have been there frequently.  
 5884. Why did you go to the contract,—were you sent for? No; I was not. I went there to test an explosive.  
 5885. Are you managing an explosive? Yes; but not any explosive in which they are concerned.  
 5886. You were not attending to the explosive on this job? I frequently went there to test an explosive. I went there yesterday for that purpose.  
 5887. To test your own? Yes.  
 5888. Therefore, you still have some connection of a sympathetic nature with the firm? No; they happen to be the only contractors that I know, and I wanted to test the explosive.  
 5889. If the firm got further work would you be taken on? I do not know; I should like to be.

J. Reid.  
 26 June, 1896.

George Forrest sworn and examined:—

5890. *Mr. Parkes.*] What is your occupation? I am a contractor.  
 5891. You are a member of the firm of Carter, Gummow, & Co.? No, I am a shareholder with them at the present time.  
 5892. An equal shareholder? Yes.  
 5893. In June, 1895, you entered into a bond with the Government of New South Wales as a surety for Messrs. Carter, Gummow, & Co. in relation to the carrying out of Contract No. 77, did you not? Yes. (*Vide Appendix No. 24.*)  
 5894. And you then made a declaration that you had property in New South Wales to the value of £6,000;—will you say where that property is? Yes. It is not altogether in New South Wales;—some is in New Zealand and some is in this Colony.  
 5895. What property are you possessed of in New South Wales? A third share of a property known as "The Lodge" property at North Shore and other property.  
 5896. Is it freehold;—have you a Torrens title? Yes.  
 5897. What is the area of the allotment? Two acres.  
 5898. What is the frontage? I could not say definitely, but it is about 500 feet.  
 5899. Is that where Mr. Carter lives now? No.  
 5900. What is the value of the property? I could not say exactly, but it would be worth about £10,000, I suppose.  
 5901. What did you pay for it? £6,000 or more, I think. We have built upon it to the value of several thousands, I think.  
 5902. When did you buy this property? Four or five years ago.  
 5903. Where do you bank? I bank with the Bank of New Zealand.  
 5904. Have you a separate account? Yes.  
 5905. A private account? Yes.  
 5906. Do you know James Gillan? Yes.  
 5907. Where is he now? At Happy Valley, near Adelaide.  
 5908. What property has he in New South Wales? I only know of his having one property, and that is in Fairfowl-street, Dulwich Hill.  
 5909. What is the size of the property at Dulwich Hill? I do not know exactly. It has a frontage of 140 feet, I think.  
 5910. What would be the value of it? I could not say. About £1,200, I suppose.  
 5911. Where does Mr. Gillan bank? I have no idea.  
 5912. Does he bank with the Bank of New Zealand also? I have no idea.  
 5913. Do you know the name by which Mr. Gillan's property goes? "Blink Bonnie."  
 5914. Mr. Gillan is in Adelaide at the present time you say? Yes.  
 5915. *His Honor.*] What do you say is the whole value of your property, including your property in New Zealand—what is your estimate of the value? Over £6,000.  
 5916. *Mr. Parkes.*] Will you please tell the Commission what your other properties are? They are in New Zealand.  
 5917. What do they consist of? Five dwelling-houses, and, I think, about five vacant sections.  
 5918. Where situated? Some of it is in the M'Andrew Road, Dunedin.  
 5919. What are the numbers of the houses? There are no numbers on them.  
 5920. Where are the vacant sections of land? In George-street, Dunedin.  
 5921. What are the numbers? There are no numbers. I ought to explain that there are three houses in M'Andrew Road and two houses in George-street. The land is at the corner of George-street and the main street in which the tramline runs.

G. Forrest.  
 26 June, 1896.

John Carter recalled and further examined:—

5922. *Mr. Parkes.*] Do you know Mr. Gillan's affairs? I do not.  
 5923. Do you know whether he has any further property in this Colony apart from that at Dulwich Hill? I do not.  
 5924. Mr. Gillan is now in Adelaide, I believe? Yes; 18 miles out of Adelaide.  
 5925. Would there be any great objection to his coming to New South Wales? There is from our point of view—from a business point of view. He is in charge of a work which is just approaching completion. We are pushing on with it night and day to satisfy the Adelaide Government, who want the work available for a supply of water next summer.

J. Carter.  
 26 June, 1896.

- J. Carter. 5924. That is the only objection to his coming over? Yes; it is purely a business objection.  
 5925. *His Honor.*] Is there anyone else who could take his place satisfactorily? No. Mr. Gummow and myself are here.  
 26 June, 1896. 5926. I suppose that unless Mr. Gummow were to go down he could not very well leave? No.  
 5927. Is Mr. Gillan an engineer? No.  
 5928. What is he by profession? He is a self-made man. He started low down in life and worked himself up. He saved his money and got into his present business.  
 5929. Is he specially competent to look after a work of this kind? He is specially competent to look after it now. He was not while the work was in course of being driven. He could not then have done without other assistance; but he is thoroughly conversant with the practical part of the work.  
 5930. Then I understand that it would be necessary for Mr. Gummow to go down if Mr. Gillan came up? I should say so. Some member of the firm must be here to represent our interests.  
 5931. How soon will the work be over in which Mr. Gillan is now engaged? I believe Mr. Gummow has received a letter in which Mr. Gillan states that it will be completed in about six weeks.

Harold Francis Norrie sworn and examined:—

- H. F. Norrie. 5932. *Mr. Parkes.*] You are an officer in the Department of Public Works? Yes. I am clerk in charge of bonds and contracts.  
 26 June, 1896. 5933. You drew up in June, 1895, a bond which was signed by Mr. Forrest and Mr. Gillan? No; I think it was drawn up on 16th May, 1895, and signed on the same date. (*Vide Appendix No. 24.*)  
 5934. Did you, before accepting their security, make any inquiry as to who Mr. Forrest and Mr. Gillan were? No.  
 5935. But it would be your duty to do so, would it not? No.  
 5936. Why not? That is a responsibility which the head of the branch has always undertaken.  
 5937. Would it be Mr. Hickson's responsibility? Either Mr. Hickson's or Mr. Darley's.  
 5938. Who was at the head of the branch at the time this bond was drawn up? Mr. Darley.  
 5939. Was it not drawn up prior to Mr. Darley taking charge? No; Mr. Darley took charge, I think, on the 1st or 2nd of April, 1895.  
 5940. Is not this your suggestion?  
 "I suggested to Mr. Hickson yesterday the desirability of blotting out his signature and printed title on the conditions, substituting those of Mr. Darley, which was at once assented to. A reference will, too, be made in the agreement and bond to the plans being in Mr. Darley's office.—HAROLD F. NORRIE, 4/4/95."  
 Yes. That was in the early part of April.  
 5941. Therefore, who would be at the head of the branch at that time—who would have to look into this matter? At that time, Mr. Darley, I think, but I believe you will see from the papers that both Mr. Mr. Hickson and Mr. Darley approved of the sureties.  
 5942. How is it that Mr. Hickson as Engineer-in-Chief recommended the acceptance of these gentlemen. He says:—  
 I think, therefore, it is right that the sureties should be insisted upon. They give the names of two men, Mr. George Forrest and Mr. James Gillen. From inquiries made I believe these men to be financially sound; and, I think, if their names were accepted as the sureties in the penal sum of £6,000, each Department would be secured as far as it is reasonably possible to be.  
 ? I think that was written in March.  
 5943. You will see that it is written on 5th April, when according to your statement, Mr. Darley was in charge? That was about the time of Mr. Darley's taking charge.  
 5944. He was in charge, was he? Practically.  
 5945. Then why should Mr. Hickson write this recommendation? I could not say.  
 5946. *His Honor.*] Mr. Darley was nominally in charge but Mr. Hickson remained practically in charge I suppose? For a few days, I think.  
 5947. *Mr. Parkes.*] Mr. Hickson also says:—  
 They go on to say that they are "a firm of sound financial standing, well and favourably known to the Department as contractors" This is quite true; they are a firm in which I have every confidence. They have done a great deal of work under me, and I can testify that their aim always has been to turn out the very best class of work possible. At the same time, misfortunes happen the very soundest firms of contractors, and the Department must look a little way into the future. Their own bond for £12,000 would be really of no use if they were unfortunate enough in the meantime to become bankrupt.  
 Does not that fairly set forth the nature of your bond? I do not quite follow you.  
 5948. Is it not a fair interpretation of the objects of your bond? As a matter of course we wanted to secure ourselves in the event of anything happening.  
 5949. If you had known that Mr. Forrest and Mr. Gillan were interested in contract 77 would you have accepted their names as sureties? I certainly would not. I did not look upon them then as two members of the firm.  
 5950. Did you know them to be contractors? I knew them to have been contractors.  
 5951. Did you know them to have been connected with this firm in any way? Yes, previously.  
 5952. You will see that on 5th April Mr. Hickson wrote the letter from which I have quoted, and on the same day it was transmitted to Mr. Darley for report. Three days afterwards Mr. Darley wrote—  
 I concur with Mr. Hickson. I think in accepting a new patent of this kind, and adopting it on a large and costly contract, that the Department cannot be too careful in securing its position by leaving all the risk on the hands of the contractors and patentees. I therefore recommend that the personal names be required for further surety. The names mentioned may, I think, be accepted.  
 Therefore it seems that Mr. Darley approved of the sureties in conjunction with Mr. Hickson. He evidently had not taken up the duties of Mr. Hickson? Nominally he had. I think the new appointment had been gazetted on about 2nd April.  
 5953. Would it not have been your duty as solicitor, practically, to the Public Works Department, to satisfy yourself as to these sureties? The Crown Solicitor is really the solicitor to all the departments.  
 5954. You are consulted upon legal points by the Department of Public Works are you not? Yes.  
 5955. And practically you fill the position of solicitor to the Department? Yes.  
 5956. Would it not be your duty to look into these sureties to see if they were substantial and good? Yes, and I did so to the extent of taking a declaration from each of the sureties that they were worth the amount of the bond.  
 5957.

5957. Did you make any inquiries into the value of the property held in this Colony by the sureties? No. H. F. Norrie.  
 5958. But you knew that they were connected with the contracting firm of Carter, Gillan, & Co.? I knew that they had been, not that they were then. 26 June, 1896.

5959. You did not inquire further to see whether they were still connected with the firm? No. I might explain that Carter & Co. and Carter, Gummow, & Co. had signed many contracts with me. Sometimes as Carter and Snodgrass, at other times as Carter, Snodgrass, and Forrest; again as Carter, Snodgrass, Gillan, and Forrest; again as Carter, Gummow, and Snodgrass; again as Carter, Gummow, Snodgrass, Maddison, Gillan, and Ewing. I do not think that at any times there were two contracts with the same parties to them. I remember upon one occasion asking Mr. Carter why it was so, and he said, "We are on our own in this." I think three or four members had signed the previous contract, and there were only two in that one. (*Vide Appendix No. 25.*)

5960. *Mr. Smith.*] In this particular case the tender was signed by three only—Mr. Carter, Mr. Gummow, and Mr. Snodgrass? The tender at the foot is signed by Carter, Gummow, & Co., and there is a marginal note asking for the names of the parties, in the event of a firm tendering, and therefore the names of Carter, Gummow, and Snodgrass are added.

5961. Those are the only men you knew in the matter at that time? Yes.

5962. In making these bonds, do you do more than take a declaration as to the sureties? No.

5963. That is the ordinary practice. You get a declaration from them stating in general terms the value of their property? Yes.

5964. And the usual course was followed in this instance? Yes.

5965. Had you not anything to do with the inquiries which were made before the papers were sent down to you with the minutes? As a matter of practice I never have.

5966. You would have seen from Mr. Hickson's minute that inquiries had been made? Yes.

5967. But you did not know anything about them? No; I was satisfied that Mr. Hickson and Mr. Darley had made inquiries. I could see that they were satisfied on the point.

5968. *Mr. Gummow.*] You have said that the names of different partners appeared in connection with different contracts? Yes.

5969. In one of your statements you said that Messrs. Carter, Gummow, Maddison, Ewing, and Gillan, appeared? To the best of my recollection there were about five in the case of one contract.

5970. Do you know what contract that refers to? No I do not recollect the particular number.

5971. Would it be No. 69? There was only one contract I think in which there were five names. I do not think five partners signed more than one contract, and it was probably 69.

5972. Do you know whether Mr. Gillan's name was ever in a contract with Messrs. Carter, Gummow, & Co. as one of the contractors? I do not know that I do.

5973. Can you show his Honor one case in which Mr. Gillan's name has been put down as a member of the firm of Carter, Gummow, & Co.? I could not say without looking into the contracts the firm has entered into.

5974. You do not know it as a matter of fact? I do not.

5975. Could you give the contracts which Carter, Gummow, & Co. have had as Carter, Gummow, & Co., giving the names in each instance? Yes.

5976. Will you make out a list of all the contracts giving the signing parties? Yes.

5977-8. As to Mr. Forrest—do you know whether his name has ever been put down as a partner in Carter, Gummow, & Co. in a contract with the Government? I cannot say.

5979. You can give us information as to that on a later date? Yes.

5980. Do you remember whether Mr. Forrest is one of the contractors in Contract 79? No; my recollection of 79 is that Mr. Forrest was made a party to release any interest he may have had in connection with Contract 72.

5981. Will you look at the heading of the agreement on page 272. It reads:—

Agreement made this 10th day of March, in the year of our Lord 1892, between John Carter and David Graham Snodgrass, of Glebe and North Shore respectively, in the Colony of New South Wales, contractors, carrying on business together at the Glebe aforesaid, as contractors, under the name, style, or firm, of "Carter and Co.," and hereinafter styled or referred to as "the contractors," of the first part, George Forrest, of Glebe aforesaid, contractor, of the second part, and Her Most Gracious Majesty Queen Victoria of the third part.

Does that show that Mr. Forrest was a member of the firm of Carter & Co.? Not as to that particular contract.

5982. As to any contract later than that date can you show whether his name appears as one of the contractors? I should have to look into all the contracts which were signed subsequent to that date before I could say definitely.

5983. As to Contract 77, there were two bonds taken, as well as some other securities? In the first place there was a covenant from the contractors, and a cash deposit of between £700 and £800; I think there was a bond also taken from three members of the firm, and separate bonds from Mr. Gillan and Mr. Forrest.

5984. Can you tell me in connection with any sewer contract which has been let whether any bond similar to that which Mr. Forrest and Mr. Gillan made was taken? No; because we have always taken a cash deposit.

5985. Have you taken sureties in any other case? I think so; I think we took sureties in the case of No. 69.

5986. Did you take a cash deposit as well? No.

5987. Do you know why sureties were taken in that case? Yes.

5988. For what reason? The contractors were being paid with funded stock at par, and they, I think, made an application to the Minister that they might be allowed to substitute securities in lieu of a cash deposit.

5989. Did other contractors get that concession? Yes. Several others who were being paid in the same way I think.

5990. Can you tell me about Contract 112;—what took place in that case? I do not recollect. I cannot say now whether we took a cash deposit or a bond.

5991. Did you take both? I am sure that we did not take both. We took one or the other; but I will get you that information.

MONDAY, 29 JUNE, 1896.

Harold Francis Norrie recalled and further examined :—

- H. F. Norrie. 5992. *His Honor.*] You were requested at the last sitting of the Commission to produce a list of contracts entered into between members of the firm of Carter, Gummow, & Co., and the Public Works Department? Yes; I now hand it in. It shows the contracts entered into by Messrs. Snodgrass and Gillan; Rochester and Gummow; Gummow, Bennett, and Canty; Gummow & Co.; Forrest and Snodgrass; Gummow and Gillan; Carter & Co., and Carter, Gummow, & Co. (*Vide Appendix No. 25.*)
5993. That is a correct list? Yes. I was asked a question the other day with reference to Contract 112. I find that we took a deposit of £870, and that there was the usual agreement under seal.
5994. *Mr. Gummow.*] Could you give us the particulars on the bonds in the case of Contract 101? I think that in the case of 101 there was a bond without cash deposit. I think that is one of those cases in which the contractors were paid from Funded Stock; but I speak with some diffidence upon that point.
5995. *Mr. Parkes.*] Did not the names of Mr. Forrest or Mr. Gillan appear in connection with the contracts of these two firms once separated but now associated? Yes; they did. Contract 22 is between Snodgrass and Gillan and the Government. In the case of Contract 78 the names are Gummow, Gillan, Maddison, and Ewing; in the case of 38, Forrest and Snodgrass; in 32, Gummow, Gillan, Maddison, Bennett; in 45, Forrest and Snodgrass; in 60, Carter and Forrest; in 61, Carter and Forrest; in 63, Gummow, Gillan, Maddison, and Ewing; in 66, Gummow, Gillan, Maddison, and Ewing; in 65, Carter, Snodgrass, and Forrest; in 72, Carter, Snodgrass, and Forrest; in 74, Gummow, Gillan, and Ewing; in 78, Gummow, Gillan, Maddison, Ewing; in 108, Carter, Gummow, and Forrest.
5996. *Mr. Gummow.*] What do you say was done in the case of No. 112? I find that we took an ordinary agreement under seal, with a cash deposit of £870 from Mr. M'Sweeney as security.
5997. No other bond? No.
5998. As to 101, I believe you took a bond only without a deposit? I think so.
5999. Who were the bondsmen in the case of 101? I could not recollect; I have dealt with so many contracts recently.
6000. I suppose you could furnish us the information as to who were the sureties in the case of 101? Yes.
6001. You took sureties for Gilliver's contract? Yes.
6002. In that case will you produce the particulars also—that is, the names and nature of the sureties? Yes.
6003. *His Honor.*] Do I understand that sureties had been taken in the case of a good many contracts or only in the case of a few? At about the time of the banking crisis we had to help the contractors very much.
6004. *Mr. Gummow.*] Could you furnish a list showing all the contracts upon which sureties were taken instead of a cash deposit within the last five years? It would take some time, as I deal with so many contracts. I am now dealing with about 7,000 a year.
6005. Suppose the question were confined to sewerage contracts? Then it would not take me very long—that is, going back to 1891.

John Mann sworn and examined :—

- J. Mann. 6006. *Mr. Parkes.*] What is your position? I am a clerk in the Registrar-General's Office.
- 29 June, 1896. 6007. Between the months of April and June, 1895, was there any property registered in your office in the name of George Forrest? No.
6008. Was there any property registered in the name of Carter, Gummow, and Co.? I did not search for that. We were instructed to search for property registered in the names of George Forrest or James Gillan.
6009. During the time I have named was any property registered in the name of James Gillan? No.
6010. *Mr. Smith.*] When you speak of the registration of property, in this instance you mean under the old Act? Yes.
6011. That would be registration of deeds? Yes.
6012. You mean the registration of vendors and mortgagors under the old Act? Yes.
6013. You do not find the names of Mr. Gillan or Mr. Forrest in connection with any registration in old branch? No; I have looked through the list of vendors and mortgagors.
6014. You could not say whether their names appear as purchasers? I could not say.
6015. *His Honor.*] You cannot say that no property stands at present in the name of George Forrest or James Gillan as purchasers, they being therefore the present holders? I cannot say that. Our index relates only to mortgagors and vendors.
6016. *Mr. White.*] You come from the old branch? Yes.
6017. Your index would not show any dealings with Mr. Gillan or Mr. Forrest unless as vendors or mortgagors,—the index of your branch would not show anything else? I could not tell you anything but that, unless we were to go through all the deeds.
6018. That would take some time? Yes.
6019. You do not know about the Real Property Office? I am not in that office.
6020. You have not searched there? No. A clerk, who is also in attendance to-day, will be able to give you information on that point.
6021. *His Honor.*] Do I understand that you cannot by any means, except searching through the deeds one after the other and examining the names of the parties, discover under the old Act who the present holders of land are? No; we index only vendors or mortgagors.

Henry Armstrong sworn and examined :—

- H. Armstrong. 6022. *Mr. Parkes.*] You are in the Land Titles Branch at the Registrar-General's Office? Yes.
- 29 June, 1896. 6023. Have you been able to find in your Branch any registration of property, between the period from April to June, 1895, in the name of either George Forrest or James Gillan? There is no such registration.
6024. You could not tell us if, at the period to which I refer, a deed was registered in the name of Carter, Gummow, & Co.? I did not look that up.

John



John Carter recalled and further examined :—

6025. *Mr. Parkes.*] Will you explain how it is that on Friday last Mr. Forrest stated in his evidence that he was the possessor during the months of April, May, and June, 1895, of a property at North Shore, called the Lodge property ;—was he the full possessor of that property? No ; only part possessor.
6026. Will you describe the circumstances under which he was a part possessor? Some time ago the old combination of Carter, Snodgrass, and Forrest, bought the Lodge Estate at North Sydney at a mortgage sale. It would be more correct to say that I bought the property ; but the transaction happened four years ago, and I cannot remember all the particulars now. I know that Mr. Snodgrass and Mr. Forrest afterwards agreed that it should become part of a joint speculation or estate. The deeds were made in my name, and remained in my name. A deed of trust was executed by me protecting the other parties' interests : and that, I think, is shortly the history of the transaction.
6027. *His Honor.*] What shares did they hold? Equal shares.
6028. And there were only three of you? That is all. Myself, Mr. Snodgrass, and Mr. Forrest.
6029. *Mr. Parkes.*] Who were the mortgagees from whom you bought the property? I cannot tell you after this lapse of time. I know that it was sold by Clarke & Co. I do not know who the mortgagees were. If I am not mistaken there was a second mortgage on the property.
6030. What did you pay for it? £5,400.
6031. What mortgage remained upon it? £3,000 remained upon it.
6032. What was the date of the purchase? I could not tell you.
6033. In what year was it? I could not tell you now.
6034. Where were the deeds lodged? They were in the possession of Sir William Manning.
6035. Did he advance a certain sum of money on them? Yes.
6036. Was it about £4,500? It is now, but it was not then.
6037. What was it then? £3,500, or £3,000, I do not know which. The property has been vastly improved since we bought it.
6038. I suppose the item of £52 16s., which appears in your Bank-book so often, represents the payment of interest upon the advance? Yes.
6039. As to Mr. Gillan—does the firm own his property too? They do not.
6040. Do you know anything about Mr. Gillan's property? Nothing. I might say, to settle your mind on that subject, that Mr. Gillan might be called a perfect stranger to me. He is almost as much so as you are. I suppose if the whole of the time I have spent in Mr. Gillan's company were added together it would not amount to more than three days.
6041. That may often occur between partners? But from your questions I might be supposed to be in intimate touch with him, whereas I really know nothing about him.
6042. Have Carter, Gummow, & Co., at the present time, any further property in New South Wales besides the Lodge property? Yes.
6043. What properties are they? We have two or three allotments at North Sydney, and a cottage and land at Marrickville.
6044. You have not a cottage at Dulwich Hill? No.
6045. The cottage to which you refer would not be the cottage referred to by Mr. Maddison as Mr. Gillan's, would it? No.
6046. *His Honor.*] Will you hand me a rough sketch showing me the boundaries of the North Shore property? Yes.

J. Carter.  
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John Young sworn and examined :—

6047. *Mr. Parkes.*] You are a contractor? Yes.
6048. You have been following that business in Sydney for some considerable time? For about forty years.
6049. You are also Mayor of Annandale? Yes.
6050. You have occupied that position during the time Messrs. Carter, Gummow, & Co. have been carrying out contracts in that district? Yes.
6051. Have you not had occasion to write to the Government complaining of the way in which they were digging up your streets? Yes.
6052. On several occasions? Yes.
6053. Will you describe to His Honor what they were doing? I thought, as Mayor of Annandale, that their breaking into our streets without giving us notice of any kind was a rather peculiar proceeding. We wrote from the Council Chambers both to the Government and to the contractors stating that we could not allow such a thing to be done unless we received proper notice, as we considered that we had the custody of the streets.
6054. Did Carter, Gummow, & Co. carry out their works there to a large extent? Yes ; to a very large extent in Annandale.
6055. Will you describe to His Honor how their digging operations affected your streets? They dug shafts down for the purpose of tunnelling. Where there was high land they would tunnel, and where the elevation of the land suited they would cut open trenches. We objected to their taking our metal, and also the material, because we thought that it belonged to the corporation.
6056. Did they not go further, and take material from your streets other than where they were actually working? I do not know that they did that.
6057. *His Honor.*] Do I understand that instead of the metal which they got out of the open trenches or from the heads of shafts being put upon the streets again they utilised it themselves for their own purposes? I do not know what they did with it. I know that they took a great deal of the material, and we objected to their taking it because we thought it belonged to the municipality.
6058. They did use some of it then? There is no doubt about it.
6059. *Mr. Parkes.*] Did they use it for their concrete? I cannot say. Of course I did not watch them.
6060. Have you noticed the two aqueducts which are being constructed over Johnstone's Creek and White's Creek? Yes.
6061. Have you ever paid much attention to the method on which they are being built? Yes.
6062. Are they being built in any but the ordinary way as far as the putting of the compo. into position is concerned? They are a compo. or concrete construction. I should call it concrete.

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- J. Young. 6063. But if the specifications say 3 of sand to 1 of cement? That would be compo., of course.
- 29 June, 1896. 6064. What should you say would be the difference in cost between 3 to 1 compo. and bluestone concrete of 5, 3, and 1? I should like to read the specifications before giving you an answer.
6065. What I want to know is, whether, in your experience, compo. is cheaper than concrete? If you compare a 3 to 1 compo. with a bluestone concrete of 5, 3, and 1, of course a good deal would depend upon the size to which the bluestone was broken.
6066. Suppose it were half-inch or inch gauge? Then I think the bluestone concrete would be a little bit the cheaper.
6067. Have you not at different times had to make up compo? More than anyone else in the country, perhaps.
6068. Both concrete and compo.? Yes.
6069. Have you ever used in your constructions a mixture of the 5, 2, and 1? Yes; I have used it for Government work.
6070. Have you ever used it on the method in which it is being used at Annandale? Well, I have used concrete in conjunction with iron-work.
6071. Some years ago you introduced a system of building arches in this Colony of concrete and iron? Yes.
6072. Would you describe the method in which you did it? Well, it is over twenty years ago. At that time concrete was not much used in this country. I advocated its use in a peculiar form. I used concrete for the roofing of houses, about twenty years ago, in much the same way as it is being used in connection with these arches. I called the attention of the architects of Sydney to what I was doing in this respect. They all met and examined the houses, which are standing at the top of William-street, to which I applied the method. They are entirely roofed-in with the construction to which I refer, and, curiously enough, they are very similar in construction to the method which is now being adopted. The way in which I carried out the work was this:—I put in the centres, and I then put about 5 inches of concrete upon them. Upon that I put an interlaced hooping secured to angle-iron abutments. As the so-called arches had not proper abutments, I secured the abutments so that they could not spread. The iron-hooping was interlaced in the centre of the concrete, the pieces of iron being about 4 inches apart. When the hooping had been put in I put in about 5 inches of concrete upon the top of that. That formed a concrete roof, which is, I think, very similar in construction to the work to which you are referring, except that the contractors in that case use  $\frac{3}{4}$ th rods instead of hooping. I myself think the hooping is a great deal better, because it presents a broader surface to which the cement can adhere. Round iron is more likely to draw.
6073. Has it not been a common thing in your experience to use iron in a lattice form? It has been very extensively used.
6074. In connection with buildings in this country? Yes, very extensively.
6075. Is there not, as a matter of fact, a patent already registered? I do not know anything about patents. I myself did not consider it worth patenting.
6076. Would you hesitate to use a grill or grid in compo. or concrete work if you wished to do so? No.
6077. You would not fear any patent? No, certainly not, seeing that I used the same construction about twenty years ago.
6078. You have noticed pretty closely the work which is going on at Johnstone's Creek? Yes.
6079. Will you observe the materials used according to the departmental plan of Contract 77, and tell me whether, from your knowledge of material, that construction would, generally, be more costly than the construction in the case of the Monier arches? Yes, I think it would.
6080. From the look of it you think there would be considerably more material? I think it is more costly, and it is better. The proportions specified would make good concrete if the sand were good.
6081. Is it not a fact that Carter, Gummow, & Co. are crushing sandstone out in that district? Yes.
6082. What class of sandstone is it? It is sandstone which I should not use for concrete. I should be afraid to use it, judging from my experience. I have used the same kind of sand, and I find that, as a rule, after a dry season has passed over, on account of the clay which is in the sand, there is a shrinkage. In one case I found that the arch itself had absolutely shrunk inwards away from the abutments. You could put your hand down between the concrete and the angle-iron, showing that the shrinkage of the concrete overcame the weight of it and pulled it together. In other cases I have found a similar result. The concrete should not have shrunk inwards, but the abutments were rigid, and therefore it shrank, and I anticipate a similar result from this construction.
6083. In spite of the iron? Yes; I have had iron in the same form; I have had a latticed hooping with the iron 4 inches apart. I do not care whether you have iron or not. Of course, if you use Penrith sand, a perfectly free washed sand, without the slightest particle of clay in it, you can get over the difficulty, but in the case of any of the sand round about Sydney there is so much clay in it that the concrete shrinks. The result in this case, I am afraid, will be that you will have cracked arches.
6084. If in a work of this kind you do use crushed sandstone, ought it not to be the best bottom block Pyrmont stone? I do not think any of it is any good.
6085. But supposing that kind of stone were used? I would use the best I could get—the freest from clay; but I do not think any of it is entirely free from clay.
6086. Do you think the top surface stone from the quarries round about Annandale would be likely to be free from clay? No.
6087. Would it make good sand? No; I do not like it. I have the strongest objection to it, speaking from my own experience.
6088. As well as being a contractor, you have taken a great interest in architecture? Yes, especially in concrete construction.
6089. And in architectural designing? Yes.
6090. Therefore, you know a good deal about geometrical design? Yes.
6091. Look at the elliptical arch as shown on the departmental plan for Contract 77, and tell me your idea of the cost of such an arch as compared with the ordinary segmental arch? Of course it is more trouble, because it has to be built from various centres. I would rather have an arch from one centre. [*Vide Appendix C.*]
6092. But which would be the more costly? An elliptical arch would be the more costly for centering, but not otherwise.

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6093. Will you look at the arch in the plan of Contract 101, and tell me the depth of the arch? It is 14 inches in the crown.
6094. And the spandril? The detail says  $13\frac{1}{2}$  inches.
6095. What is the depth of the crown in the case of the ellipse arch in Contract 77?  $24\frac{1}{2}$  inches.
6096. Look at the spandril? It is a brick and a half or two bricks.
6097. Which do you consider would contain the greater quantity of material, the arch in the plan of Contract 77 or the arch in the plan of Contract 101, leaving the piers entirely out of the question, and taking the arch itself;—would not an ellipse arch with a big span necessarily have to contain a very great amount of material for its strength? More than a narrow arch, of course.
6098. You have said, I think, that a segmental arch was the safer? I think so.
6099. Is it not a recognised rule that an elliptical arch must be made stronger as compared with the other kind of arch? It should be, but it never can be.
6100. Speaking generally, if you were called upon to decide which was the better plan, that in the Monier plan in the case of Johnstone's Creek and White's Creek, or the plan for those aqueducts as prepared by the Department originally, which would you prefer to use, supposing there were a difference of £250 in favour of the Monier arches? I think I would take the brick construction.
6101. For what reason? I think from what I have observed that the sides of the culvert or sewer, or whatever you call it, are too thin in the case of the Monier plan. I think it will leak. And when you come to consider the liability to shrinkage and cracking, that again is not in favour of the construction. I do not think a saving of £250 justifies the use of the Monier plan.
6102. Your general opinion of that structure is that it will not be secure? I am afraid not.
6103. What period would be necessary to show the defects? I do not think you can say until after next summer what is likely to happen. I am speaking now from my own experience in work of a similar kind. It has been very unsatisfactory, and I think in this case it will let the water through.
6104. As a matter of fact the very highest class of cement will let water weep? Yes; I have always found it so.
6105. What is your opinion of iron put in concrete should it become wet? I have a very good opinion of iron put in concrete. I believe that the putting of it into concrete arrests rust.
6106. But what effect is produced upon the mass if the iron rusts? It depends upon the condition it is in when the adhesion of the cement takes place.
6107. You think then that the cement preserves the iron from rusting? I think it arrests rust, at any rate.
6108. But should the rust get to the iron, what would be the effect upon the mass? If there were a crack, and the water got to the iron, it would probably rust it through if the iron were not very thick.
6109. But would not the rust accumulating on the iron split the material surrounding it to pieces? Yes.
6110. It will even split stone of great strength? Yes; but you are now speaking of a different matter. If you put iron in stone and run it with lead it will burst the stone, because you can never get the lead sufficiently tight to prevent the dampness from getting between the lead and the iron; in that case the iron corrodes and bursts the stone; but that is not the case where cement is used.
6111. You think cement would preserve the iron from rusting providing the iron is put in clean? Yes; as clean as it is ordinarily put in. There is generally a little rust upon it; the peculiar property of cement seems to be to hang on to the iron very closely.
6112. *His Honor.*] You do not think then that if there happens to be a little rust on the bar before the cement is put on that it will make any appreciable difference? No.
6113. You think it stops oxidation beyond the point to which it has gone? Yes; that is what I have observed when I have taken this work to pieces in the various forms in which I have used it.
6114. Have you had the upper sandstone round about Sydney analysed to find how much alumina it contains? No.
6115. Does the hard crystalline sandstone contain any? Just as much as the other.
6116. As much as the brown or red sandstone? Yes; it is only the iron which colours them.
6117. It results from the decomposing of the carbonate of iron? Yes; but all the Sydney sandstone is unsatisfactory for concrete.
6118. Because, as you say, it all contains clay? Yes. There is too much clay, and it shrinks. Of course you can make a perfect concrete with the thoroughly washed sand from Emu Plains. There is no clay in that.
6119. *Mr. Parkes.*] It is only in later years that crushed sandstone has been used? Yes; the sand is very similar to the sandstone formation itself.
6120. In former years none but river-washed sand was used? No.
6121. Crushed sandstone is never used in private practice? I never knew it to be used. I should fancy that washed sand would be clearer of clay than any sand made from crushed rock.
6122. *His Honor.*] Drift sand, I suppose, would have a small quantity of organic matter in it? Yes; but even then there would be some clay. I have sometimes used sand out of the gutters myself, and I have found that when it has been washed again it makes a very good sand, because you get the detritus from the bluestone off the streets, and the freer you get it from the clay, of course, the better sand it is for concrete. I have used it when economy has been in question, but I would not use it if it were not.
6123. *Mr. Parkes.*] You would not use it in an important structure? No, not in such a work as is shown upon the plan of Contract 77, for instance.
6124. *His Honor.*] You did not tell me what answer you received to the letters which you wrote to Carter, Gummow, & Co., and to the Department? I thought with the aldermen that if the firm were going to break up our streets we ought to have had notice. They should have asked permission. They simply said that they had an order from the Public Works Department, and that they were going to carry out the work. They simply put us at defiance.
6125. *Mr. Parkes.*] Did you get a polite answer when you did write? Well, that is the kind of answer we got. It was scarcely polite. I think that if they had wanted to break up our streets we should have had notice.
6126. *His Honor.*] Has any of this ground been filled in again yet? No; but we are responsible for it, I suppose, if they fill it in badly.
6127. At any rate, you do not know what they are going to do when they come to fill it in? No; they are not yet so far advanced as that in any case.

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6128. Did I understand you to say that, in point of fact, an elliptical arch could never be as strong and as sound as a segmental arch? It can under certain circumstances—if the bricks of the arch are made to radiate to the centres on which the arch is struck. You get a strong arch then. But you must have your bricks made for that purpose.
6129. You must have several sets of bricks? Yes.
6130. But, supposing the bricks are laid in good cement, does it really matter, so far as the strength of the structure is concerned, whether they radiate or not in a large arch? No, not if they are bedded in good cement mortar. The radiation is not of very great consequence in that case. A large number of bridges have been built on our railways in that way.
6131. It is like a concrete arch in one piece, as it were? A concrete arch, if it is perfect, is in one piece. I have put up this concrete work fully 50 feet in length as flat as the top of this table, and that is standing now, showing that it does not depend upon the arch.
6132. *Mr. Smith.*] As to this objection, when was it that you made it, as Mayor, on behalf of the Borough of Annandale? About the time of the commencement of these works.
6133. When was that? I suppose it would be about two years ago now.
6134. Did you not go to Court about it—was not some application made to the Court? We felt so sore about it that we were inclined to go to Court, although we thought we had no chance.
6135. You were told, I believe, that the City of Sydney applied for an injunction in a similar matter some eight or ten years ago, and that it was refused? We were told that, but we found upon consultation with our solicitors that we had no case. That did not alter our opinion. We thought that what had been done was very discourteous.
6136. I suppose that you know that this system, called the Monier system, has attracted a great deal of attention on the Continent and in America? Yes.
6137. Have you studied any of the works and the discussions on the system? No, I have not.
6138. Have you read of any tests of the system which have been made abroad? No.
6139. *His Honor.*] Did you notice the way in which they put the grill into the arches? Yes. No doubt it is very good as far as it goes, but I do not think there is anything new in it.
6140. *Mr. Smith.*] Have you had any contract under the Government for any of these sewers? Yes; I had a sewerage contract at Cook's River.
6141. How many years ago is that? Nine or ten.
6142. What sand did you use in connection with those works? Drift sand.
6143. *Mr. Gummow.*] As to the cutting up of the streets at Annandale, do you remember myself and Mr. Carter calling upon you at your office in Park-street? Yes.
6144. And explaining to you under whose instructions we came to cut up the streets? Yes.
6145. Do you remember that we apologised to you, and explained to you that no discourtesy on our part was intended to the Borough of Annandale—that we had instructions to do what we were told, and not to ask any other people for further instructions? I do not think you made any apology, but I think you said you were doing it under instructions from the Department. I think I told you that you might have been courteous in the matter.
6146. Do you not think that the mere fact of our calling upon you was an act of courtesy, even supposing we had made a mistake before? That was after the mischief was done.
6147. So far as we were concerned there was no mischief at all? If you think that what you did was sufficient, well and good; but I think that before breaking into our streets you might have consulted the municipality.
6148. Allowing that a mistake was made, and that there was a discourteous act on our part in the first instance, do you not think that we did our best to atone for it by calling upon you and explaining our position? You did that, certainly.
6149. As to the stuff that was removed, do you know whether the Annandale borough carts take any of it away? They take some.
6150. They get all that we have not put back, do they not? All that you do not want, I believe.
6151. We have to deal with your street superintendent? Yes; I do not interfere in the matter.
6152. As to the matter of bluestone concrete, Mr. Parkes asked you which you considered cheapest, a 3 to 1 compo. or a 5, 3, and 1 bluestone concrete, and you said that bluestone concrete would be a little bit cheaper? Yes, I think it would be.
6153. Do you consider that a 5, 3, and 1 bluestone concrete would be cheaper than a 5, 3, and 2? The latter would be dearer by 1 of cement to the same quantity.
6154. Which would be cheaper, a 5, 3, and 2 bluestone concrete or a 3 to 1 compo.? That wants a little calculation. If you had 5 of metal, 3 of sand, and 2 of cement, you would use two and a half casks of cement to the cubic yard. If, on the other hand, you used only 1 of cement, it would be about half the quantity, of course.
6155. Which would be the cheaper? The use of the 2 would be the dearer, of course.
6156. Which would make the better article? The 5, 3, and 2.
6157. You say you paid particular attention to these arches when they were being built? Yes.
6158. Do you know whether the arches are built of compo. or concrete? I have not been on the work when the mixing has taken place, but on going to the work I found there fine bluestone—I should say about  $\frac{3}{4}$ -gauge—and I presumed from that it had been used. Mixed with better sand, it would make a good concrete.
6159. What sand was being used? Crushed sandstone.
6160. Do you know whether it had been put through a crusher? Yes; I could see by the texture of it that it had. Of course, I had not seen it crushed; but I could tell from the feel of it also.
6161. Do you know where it came from? I presume it came from somewhere near the city.
6162. You know where the crusher is in that neighbourhood? Yes.
6163. Is it on your property? I do not think so.
6164. Is there a crusher on any of your property? No, I do not think so.
6165. You do not know of your own knowledge whether any of the sand came from the crusher? I could only take the sand as it was. As I tell you, I felt some of it.
6166. Do you know whether it was local sand from Annandale or Balmajin, or from where it came? No; I simply took the sand as I saw it in the heap.
6167. Have you ever tested different sands? Yes.

6168. Have you tested sand of a nature similar to that which we are using? Yes; I have tested all the sandstone near Sydney. J. Young.
6169. I mean for the strength of the sand? Yes. 29 June, 1896.
6170. Do you consider that that sand will stand as great a tensional strain as Nepean sand? I cannot say that I do.
6171. If it did stand as big a strain, would you consider it good? I should not, because it contains clay, which is fatal, in my opinion, to the making of good concrete.
6172. You consider that a small quantity of clay is fatal to the making of good concrete? Yes, any quantity at all. There is quite enough clay in the cement as it stands. By adding more you spoil it.
6173. Do you know what is the use of the iron in the concrete? Yes, of course.
6174. With what object is it put in? To overcome a bond, as it were—whatever strain is thrown on to the iron instead of on to the concrete.
6175. What strain would that be? There are various strains, of course. The weight of the material, in itself for instance, has to be considered. It must be held up. The material put in does that, and binds it together, doing in a less degree what a bond of a brick or piece of stone would do by adhesion.
6176. If this iron holds up the work, and if there were no iron run into it, do you think the arch would tumble down? I do not think it would absolutely tumble down; but you could not make it so slight as you are making it in this case, you would require a greater thickness. I think the iron is beneficial.
6177. Do you know what tensional and compressive strains come upon the arch? No.
6178. As to leakage, you said that no cement would hold water? A very neat cement perhaps might do so; but there would be a great danger of its cracking.
6179. What head of water are you speaking of? I mean the water as it would flow through the sewer.
6180. About 3 feet of head? I presume it would vary. For instance, you would get some storm-water in sometimes. You could not help it.
6181. What would be the height of the sewer? It looks to be about 5 feet; but I have not measured it.
6182. Do you know whether it would run full during a storm? I do not know; there may be escapes.
6183. You do not know whether there are any or not? I presume there would be some.
6184. You do not consider that the cement would stand—you think it would leak? I fancy it would leak. I fancy you will find a dampness along the whole length of it.
6185. That is your opinion. Yes. I should be rather afraid of it if it were mine. I have had so much experience in these concrete structures, and I know the danger attending them.
6186. As to the expansion and contraction of cement, have you considered that? It contracts; it never expands.
6187. Do you consider that neat cement contracts more or less than 1 to 1? One to 1 is very extreme.
6188. Which would contract the more, neat cement or 1 to 1 compo.? Anything containing sand would contract because you cannot fill up the whole of the interstices.
6189. Have you noticed a 1 to 1 compo. when it has been used? Yes.
6190. Also, 1 to 2 and 1 to 3? Yes.
6191. Have you noticed any difference in the hair-cracks in these different kinds of compo.? There are more hair-cracks in cement nearing neatness than with a proper amount of sand.
6192. Do you know whether iron expands or contracts? Yes.
6193. Do you know whether iron and a 3 to 1 compo. expand and contract equally, or practically so? No. I do not know whether the expansion and contraction would be equal. I should rather think not.
6194. In your opinion, would it be equal or not? I do not see how it could be equal, because the concrete would not expand. The iron would expand and contract.
6195. *His Honor.*] Do you say that if you get concrete into a state of absolute dryness and then heat it that it will not expand? If you put it in dry it would not be concrete.
6196. But suppose you waited until it was thoroughly set, so that there would be absolutely no water left in it? Then it would have contracted all that it intends to contract for the time being; but after the heat of the summer it will contract in spite of you, just as ground will crack.
6197. You mean that it is always contracting? It may eventually reach a stage at which it will contract no more. It will, however, contract sufficiently to cause cracks. That is my objection to it.
6198. *Mr. Gummow.*] As to this concrete and ironwork, you have said that you built some houses at the top of William-street, and that you there used this construction in very much the same way that it is being used upon these Monier arches—what did you mean by that?—Did you put in compo with iron bars? I had hoop-iron interlaced, 4 inches apart.
6199. Did you use compo. or concrete? We used concrete, not compo.
6200. What was the object of putting in the iron? To strengthen it. I considered that as the concrete was deprived of bond of every description—as every mixture of that class is unless it is thoroughly set—the introduction of the iron would make it into one mass, and would answer the purpose. The work is there, and can be seen at any time.
6201. Does it leak? It cannot leak. The concrete would leak if water came on to it, but there is tiling over the top of the concrete to prevent the water from getting through.
6202. Do you know the use of the iron in these arches at Johnstone's Creek and White's Creek? Yes.
6203. What is the object of it? I presume it was put in with the same object as I put in my lattice hooping. It cannot hold the abutments, and I do not think it is required to hold them, because they are good enough in themselves. It can only have one effect, and that is to give the lateral and transverse bond that you require. If you filled the structure with iron you could not do more.
6204. Is this grill-work put into the centre of the thickness of the arch? It seems to me to be a little more on the outside.
6205. Is there any object in doing that? I presume so. I do not know it myself.
6206. You do not know whether there are any tensional or compressive strains to be considered in that connection? I would take my own practical experience in these matters before any theory.
6207. Regarding patents, have you any knowledge as to whether a patent is valid or invalid? None whatever; but I may state with reference to that matter that I used Tyerman's patent hooping at a time when somebody had a patent here. I was sued for using it, although the iron came from Tyerman's, in England. It was found in the course of the proceedings that the iron had been used in the country before the patent was taken out for it, and that therefore no action lay.
6208. *His Honor.*] Was that used in a brick wall? Yes. 6209.

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6209. *Mr. Parkes.*] What case was that ;—who took proceedings against you ? It happened in Victoria. Proceedings were taken by a person named Cope, who had the patent in that Colony.
6210. *Mr. Gummow.*] Do you know whether the patent laws of Victoria are the same as in New South Wales ? I do not.
6211. As to the concrete arches—do you consider that concrete arches will stand in the same way as compo. arches ? Taking the compo. and concrete as described in the specification, I should prefer the concrete.
6212. For what reason would you prefer the concrete ? Because of the adhesive properties of the cement ; I should think it would adhere better to the rough small bluestone than to the other material.
6213. You prefer it for strength ? Yes.
- 6213½. But having regard to climatic changes, which would stand better ? I do not think there would be much difference so far as that is concerned. My strong objection consists in the use of the sand. If you put good sand into it, I think it would be an excellent job.
6214. Then the question of our making a good job depends upon our having good sand or not ? Yes.
6215. Providing the sand were good, you would be satisfied that it was a good job ? The sand I mean is the Emu Plains sand—the sand from which concrete is made for the wooden blocks. I was the first to draw a specification for making concrete for the wooden blocks. I have used it ever since, and it has answered admirably. In my opinion, in cases where it does not answer well the sand used has contained clay.
6216. Still in this case you say that if the sand were good it would be a good job ? Yes.
6217. *Mr. Parkes.*] You must recollect that the arches upon the Monier plan are 82 feet from centre to centre ? Yes.
6218. Is that not a very long arch in which to trust to any cement construction ? It is longer than I should have cared to construct it myself.
6219. Even supposing good sand were used in such a construction, if the arch were of the depth shown upon the plan, would there not be a risk of contraction ? I think it is an extreme length for concrete or compo.
6220. Is there not an element of danger, so far as contraction is concerned ? Yes.
6221. Where you crush sandstone for sand, what effect has the crushing upon the sand ? The crushing makes the crystal finer than it otherwise would be. In the case of the Sydney sandstone, it is too fine as it is.
6222. The crushing, then, would also be a dangerous element in the sand used in this compo. ? Yes. I would rather have coarser, cleaner sand.
6223. *Mr. Gummow.*] I think you expressed an opinion that cracks might be expected to show themselves in this work next summer if they were going to show at all ? If it were my job I should be afraid, judging from my past experience, that cracks would result. I do not say that it will necessarily take place in this structure.
6224. If the work were guaranteed for three years, would you consider that term long enough ? The cracks ought to come out in that time.
6225. If they do not come out in that time they will never come out ? I should consider the structure safe after that.
6226. *His Honor.*] Even if we had another temperature of 108·5 ? Yes ; but it would try the structure.
6227. *Mr. Gummow.*] You think the sand which is being used is from crushed sandstone ? Yes.
6228. What do you mean by crushed sandstone ? I mean the sand from stone which had been put under rollers. It is not washed so that you get the clay out of it, and that is my great objection.
6229. But is it sand which has been put through a crusher ? I take the sand as it is, and I consider that it is sand from crushed sandstone. I do not object so much to your crushing the stone as I object to the stone itself. I say that there is too much clay in the sandstone round about Sydney to permit of good concrete being made from the sand.
6230. In answer to a question just now, you said that in the process of crushing the crystals were made finer ? The sand is the detritus from granite originally, and that is a crystalline rock.
6231. Suppose the sand is not crushed in such a way as to make the crystals finer, would it not be better than sand which is ordinarily taken from a crusher ? The sand from the Sydney stone, whether it be drift or solid rock, has been sand over and over again before it is found in its present form. The crystals have been worked down too fine in this process. They are not the crystals which come direct from the rock in the first instance. They have been washed by the sea again and again, rendering them as fine as you see them to-day. They are too fine for the purpose for which they are sometimes used.
6232. In the sand you saw at the works had the crystals been crushed into dust ? Yes, compared with what they originally were.
6233. But I mean artificially ? Yes ; undoubtedly the crushing will make the crystals smaller.
6234. You consider that in the sand you saw the particles of sand had been crushed ? It is crushed too fine ; that is what I think.
6235. What I mean is—had the particles been crushed at all, or were they in their natural state from the sandstone ? Even in their natural state in the sandstone they would be too fine for the purpose.
6236. *His Honor.*] What you say is that they are too much water or weather worn ? Yes ; that is the worst of the Sydney sandstone. It is too fine in the rock, and it is fine in the drift, whichever way you take it.
6237. *Mr. Gummow.*] Do you know from what place the standard sand used in the Government departments is obtained ? I do not know anything about what the Government do. They do some very curious things sometimes.
6238. Do you know whether they take the sand from crushed sandstone as the highest class of sand ? I believe they would use the washed sand I speak of if it were not for the cost of it.
6239. I am referring to the standard sand—the sand to which we are referred for information as to what good sand is ? Sand should be free from clay, or else it is not sand, properly speaking. It is a mixture. If you get sand free from clay, you get a perfect sand.
6240. As to the sand used by the public departments—do you know what their standard sand is ;—are you sure that there would not be any clay in it ? That I do not know ; but I presume they know what good sand is.
6241. Do you know whether the sand we are using would stand a higher test than Nepean sand ? I should

- should not believe it. It would be totally against my experience. I should say from my forty years' experience that an error had been made somehow.
6242. If you had heard that the sand we were using would stand a higher test than the Nepean sand you would think there was a mistake somewhere? Yes.
6243. *Mr. Smith.*] Have you tested the sand which has been used at Annandale? I have only my experience to go upon.
6244. You say you have handled it? Yes.
6245. And that is the only test to which you have subjected it? Yes.
6246. *Mr. Parkes.*] Supposing bad sandstone is crushed? Then, of course, you could not get good sand. No man has done more work in concrete in the Colony than I have done. I am of an inquiring turn of mind, and in connection with this particular kind of structure I have endeavoured to ascertain the why and wherefore of things. You must have a good deal of experience before you can find out many of these things for yourself.
6247. *His Honor.*] I understand you to say that it is not a question of tensional or compressive strength;—you say that in the case of concrete made from sand containing clay there is the risk of a slow, gradual, shrinkage? Yes, that is the danger; and I found that belief upon my experience. Of course, if the thing does not occur so much the better.
6248. Then you would not use crushed sandstone? No; because it contains clay in just the same way as does the ordinary drift.
6249. *Mr. Gummow.*] If an arch had been built twelve months ago, and were still standing showing no signs of cracking, having been made out of a compo. including sand from crushed sandstone, what would you consider the reason of its standing to-day? I should want to know when the work was done and how it was done. I should like to give it a little more time, say, to the end of next summer. Twelve months ought to show all the weak points if there are any. Of course, it depends upon the following summer. If you get a dry hot summer the work will have a good trial.
6250. What do you consider last summer? Quite hot and dry enough.
6251. And if an arch stood through that, you would consider that it had been subjected to a good test? The arch standing by itself is no test at all, if you are referring to your test arch. You put it against your abutments singly, by itself. I have not seen the arch; but the probability is that whatever the effect the climate might have upon it you would not, from its position, see the effects.
6252. But if it contracts you ought to be able to see the effects of the contraction? It may be that your abutments contracted also.
6253. *His Honor.*] You mean that they possibly closed in with the arch? Yes. If they were fixed with the arch they would come in with it. If you want a perfect test you must have an absolutely rigid abutment. Unless you have that there is no proper test.
6254. *Mr. Gummow.*] Would not the cement mortar, or concrete, shrink away from the iron in such a way as to show the shrinkage? It might contract, but it would drag the abutments with it. You have only temporary abutments.
6255. But suppose the abutment is strong enough and heavy enough not to be dragged? Still, you could not test a single arch by itself.
6256. You would not consider it any test if the arch stood through last summer? I do not think it is a good test. You must have your abutments perfectly rigid, and then your arch must also be perfectly rigid.
6257. Can you get that perfect rigidity? That is the only way to test the structure.
6258. You do not know whether, in the case of this test arch, the abutments are rigid? I do not know.
6259. If they are, ought not the cracks, if there are to be any cracks, to show by this time? No; I do not think it is a test at all.
6260. Why not? I will give you my reason, and it is this: You must keep the springing of your bow, as it were, as rigid as possible. If it comes off a certain line, even to the extent of a  $\frac{1}{4}$  inch, there is shrinkage, and that would draw the abutments.
6261. *His Honor.*] Supposing that there is a grid of iron in the structure? It will do just the same thing.
6262. If it were in the intrados of the arch, close to the lower curve, would it be possible for the compo. to shrink without cracking the extrados of the arch? If it were distributed over the length it might do so. A peculiarity of concrete is that it goes sometimes where you do not expect it to go.
6263. *Mr. Smith.*] I suppose that by an ordinary test you can find out the strength of the sand? I should be dubious about ordinary tests.
6264. Supposing there were a certain amount of clay, which you say is a dangerous element, in the sand, could you not discover it by an ordinary test? You could tell whether there was any clay in it by analysing it, certainly.

Walter Alexander Smith sworn and examined:—

6265. *Mr. Parkes.*] You are an officer of the Works Department? Yes. I am a district engineer.
6266. Not long ago you made a report to Mr. Hickson about the construction of a culvert over a creek at Strathfield? Yes.
6267. What creek was that? I do not know of any name for the creek, but there was an old culvert there.
6268. It was a small drain? Yes.
6269. Will you tell me the material you intended to use in the culvert as originally designed? The Monier plan was the one I originally proposed, but the Road Superintendent had suggested an ordinary buckle-plate culvert.
6270. What was the width of the road at that point? I have a description of the culvert. It is 55 feet long, with a 5 ft. 6 in. span.
6271. What I want to know is, what was the nature of the original plan? There was no original plan apart from the suggestion of the local officer.
6272. What was the nature of it? He wrote reporting the dangerous state of the old culvert, and recommended that a sum of money be provided for a new one.
6273. How much? Upwards of £300.
6274. Where is his report? There was no report; there was merely a short minute. It is with the papers, I suppose.

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- W. A. Smith. 6275. *His Honor.*] Did he make any estimate? There was no estimate in detail. The minute referred to the bad state of the culvert, and recommended that £300 be provided for the erection of a new buckle-plate culvert. I was divisional engineer at that time, and this Monier system having come forward I recommended that the culvert should be built upon it.
- 29 June, 1896.] 6276. Of course you went into calculations to discover whether it would be cheaper? I went into a rough calculation in connection with the Monier culvert, and I saw that it would be cheaper than the culverts we had been building with buckle-plates.
6277. *Mr. Parkes.*] Will you let us know how these buckle-plate culverts are built—they have stone and concrete abutments? Yes.
6278. Of what thickness are they? About 12 inches.
6279. Between these, the buckle-plates are suspended? If it was a single opening the buckle-plates would span right across.
6280. Would the 5 feet 6 inches be covered by one buckle-plate? They are of different sizes; as far as I can remember, the largest is 3 feet 6 inches.
6281. The buckle-plate forms the top of the arch? Yes.
6282. Over that you fill in with tarred metal, and that makes the roadway? Yes.
6283. Could you adopt a 4½-inch brick arch instead of buckle-plates? I have never seen it.
6284. Why could you not adopt a 4½-inch brick arch? I do not think it would give a sufficient factor of safety.
6285. We are told that the concave surface of the 4½ inches will stand 2,020 lb. of pressure to a single brick;—what would it be on the convex face? This would be the tensile strength of the mortar; the compressive strength would be about ten times that amount.
6286. Then a 4½-inch brick would do? I have not gone into the matter, but I should not like to build such a structure. You are assuming that all the material is of the very best and the strongest that could be obtained. I have not gone into the question of a single-brick arch.
6287. The only difference between an ordinary culvert and a culvert on the Monier system is that there are Monier plates instead of buckle-plates? That is so; but in addition to that the walls would not require to be quite so high, because the arch would stand lower down on the walls; there would be a saving of concrete in the walls.
6288. That would not be much in a 5-foot span, would it? In a small case like that it would be slight, but there would be a difference.
6289. What would be the cost of buckle-plates? I have had nothing to do with them for over two years, and I do not know the present price, but I suppose it would be about £6 a ton; the price varies every year.
6290. What was the price which you paid for the Monier plates? The arch was built in sections on four separate days, and it cost £22 16s.—that is simply for the arch.
6291. According to the original idea you would have had stone abutments? Stone or concrete.
6292. When you adopted the Monier system, what abutments did you have? Concrete.
6293. Did you report afterwards to Mr. Hickson as to the difference in cost between the original plan and the Monier? No; it was arranged in conversation with Mr. Hickson; the whole thing was done by day labour; Mr. Hickson and I had a conversation; I made rough calculations, and found that the Monier system was cheaper; I showed him from my figures that it would be cheaper, and he instructed me to proceed with the work.
6294. Did it come out 50 per cent. cheaper? I think it was about 30 per cent cheaper; the actual cost of constructing the culvert, exclusive of the removal of the old brick structure, was only £114, while the construction of culverts of equal length and capacity, in which brick or concrete and wrought-iron buckle-plates were used, had cost about £165.
6295. Did you take out a special estimate for the work at this particular place? No. We had been building culverts which would have applied to this place at Centennial Park, Stanmore, and in other places.
6296. Can you give us the cost and quantities of the culverts in those cases? They could be obtained. I should like to explain that when I built this Monier culvert I was divisional engineer of the metropolitan division. That office is now abolished, and all the papers relating to any work in the metropolitan district have gone, I suppose. I do not know where you would find the papers now. Of course the old contract-books can be turned up, and I should think you could find any information you would be likely to require about the culverts in them. So far as this particular Monier is concerned, I have worked out the cost, and I can give it to you, I think, within a few shillings. The actual cost of constructing the arch only I make as follows:—Sand, 4¼ cubic yards at 6s., £1 5s. 6d.; cement, 9½ casks at 18s., £6 3s. 6d.; iron, 3½ cwt. at 10s., £1 15s.; centering, say £6; labour, one man at 8s. and two at 7s. a day for six days, £6 12s.; tools and contingencies, say £1. The total would be £22 16s., or 79s. per cubic yard.
6297. Was it upon your report that Mr. Hickson wrote this letter, “I recommend this for the Minister’s approval. I might state I have just completed, with the permission of the patentees, a culvert on the Parramatta Road built on this principle, with most satisfactory results, financially and otherwise”? I cannot say. I know that Mr. Hickson did write a letter to that effect.
6298. On what date did you complete this culvert? About 24th July.
6299. Then if the letter from which I quoted were written on 18th July, 1894, it would be written before you had completed the work? Yes; but of course Mr. Hickson would be justified in saying that the results were satisfactory, because he had an experience in this case which tended to show the enormous strength of the arch, as when the first length of the arch was finished, through a misunderstanding, the heavy traffic of the Main Western Road was allowed over it when the mortar was six days old. The result, however, has been in every sense satisfactory. Not the smallest movement or crack has taken place, although the whole of the traffic over this culvert for five weeks had been confined to a 9-foot width. Of course, I had reported that to him.
6300. *His Honor.*] One-half of the arch would be in use at the date of the report, then? Yes; I imagine that it would have occurred perhaps in the first week in July.
6301. *Mr. Parkes.*] But, as a matter of fact, did not the second arch give way under the test? No.
6302. What occurred? There was an accident, was there not? No.
6303. *His Honor.*] Did something go wrong in the construction? A very trifling thing occurred, but it is scarcely worth mentioning. Mr. Davis spoke to me about it a few days ago. A small part of the compo., put up over night, got frozen and perished.

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6304. It got frozen before it was set? Yes; it was only a very small patch.
6305. *Mr. Parkes.*] What was the thickness of the Monier arch? Four inches on the top.
6306. What was the material? Three to one compo. with bars  $\frac{1}{4}$  inch and  $\frac{3}{8}$  inch.
6307. Was the portion of the arch which the heavily laden dray went over completed on 2nd July? I could not say.
6308. When did you start the work? Somewhere about the end of June. I do not remember the exact date. The only way in which I have been able to arrive at it at all has been by turning up my diary, which I see that I visited the place every second or third day from the 25th June to the 24th July.
6309. Therefore, if Mr. Carter, after a conversation with Mr. Hickson, offered to allow this patent to be used for a royalty of 15 per cent. on 2nd July, it would be during the time you were constructing the culvert? I imagine that that would be so.
6310. *His Honor.*] Have you compared the cost of the arch alone with the cost of the buckle-plate work alone to see what saving there would be, quite apart from the cost of the abutments or any other part of the structure? No.
6311. I understand that the 30 per cent. you mentioned just now as the apparent saving would be taking into calculation the abutments in both cases? The figures I then gave included the whole structure.
6312. So that comparing the spanning of the opening alone, that proportion of saving would be much larger in favour of the more economical plan? Yes.
6313. It might come to 50 per cent. and more at that rate? Yes; the arch in this case was built as cheaply as possible. I had a gang of men there who did the work as quickly as it was possible to get it done. They were all experienced men.
6314. When you got in your centering how did you proceed with the work? The centering having been put into place, the lattice work was constructed for a quarter of its length and put over the centering. Between the centering and the iron we had wooden chocks at the intersection of the bars. Then the mortar was thrown in and rammed, and as they worked up to the wooden chocks they were all withdrawn.
6315. How was it put in between the interstices of the grid? It was put in on the top and rammed in with a heavy rammer.
6316. Jammed through do you mean? Yes.
6317. It was not put through by handwork? No. We used the most heavy rammers—as heavy as a man could lift.
6318. You were not afraid of that bending the iron work? No; the compo. would squeeze under it at once. I inspected the arch the other day and I could not detect the sign of a flaw in it.
6319. I understand you put in the whole span across, a quarter of the width? Yes.
6320. *Mr. Parkes.*] Would it require more costly abutments to carry the Monier or the ordinary buckle-plates? They would be more expensive in the case of the buckle-plates, because you have to build the wall higher, the plates being flat.
6321. There is a saving in the abutments in this case then? Yes. The greater the rise in the arch the greater the saving in the wall.
6322. *His Honor.*] Did you fill in the spandrels with any particular material, or only with earth and metal? With clay, and metal on the top.
6323. You did not use concrete to strengthen the spandrels? No.
6324. It is simply the arch itself that is doing all the work? Yes.
6325. *Mr. Davis.*] Mr. Parkes asked you with reference to the thickness of the arch, your opinion as to whether a  $4\frac{1}{2}$  brick ring would be sufficient, and you had some hesitation in replying to his question;—is it not a fact that the crown of the arch at Strathfield is very near the surface of the road? Yes.
6326. In designing a culvert of that description, had you not to take that into consideration? Yes.
6327. Would not the concussion caused by the traffic probably damage the brick arch if it were put as near to the surface of the roadway as is the Monier arch? It probably would, especially if the bricks were at all defective.
6328. So that it would not be so much tension and compression that you would have to take into consideration as the concussion caused by the traffic? Yes.
6329. As to the buckle-plates, you say that the cost would be about £6 per ton;—have you not made some mistake there? I said I have had nothing to do with them for two years, and that I did not know what the present price was, but that I presume it would be about £6 per ton.
6330. You are not sure about it? No.
6331. Would the lifetime of a buckle-plate compare favourably or otherwise with the lifetime of a Monier plate? It would compare unfavourably.
6332. That is to say, the Monier arch would probably increase in strength, being stronger fifty years hence than it is to-day, whereas a buckle-plate deck would deteriorate through corrosion, and would have to be renewed? Fifty years hence the Monier arch would be in a better state than it is to-day, and the buckle-plates would probably have collapsed by that time.
6333. What did you say was the cost of the culvert per cubic yard? Seventy-nine shillings.
6334. Without taking into consideration the patent fees? Yes.
6335. Does that include the cost of material and labour? Yes.
6336. The centering in the case of such a culvert would be comparatively simple compared with the centering which would have to be used in an arch of a 75 feet span? Yes.
6337. A 75 feet span arch would cost considerably more as to centering than a small arch of this description? Yes.
6338. The £114 you gave, therefore, would include the side walls? Everything connected with the culvert.
6339. What would be your own estimate for a culvert built with buckle-plates and similar side walls to those which would be put in when the Monier arch is used? I have not got an estimate out. I pointed out to Mr. Hickson at the time, however, that, taking the cost of work just completed as a guide, a buckle-plate culvert would come to about £165. That estimate was taken out at the time from works which had been lately carried out.
6340. You say you pointed that out to Mr. Hickson? Yes.
6341. You were in constant communication with him during the time these works were in progress? Yes.
6342. You saw him three or four times a week or more? Yes.

- W. Smith. 6343. You frequently had conversations with him as to the progress of the work? Yes.  
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 6345. What was the last part of the work you did at that culvert;—was it not in connection with the gully shafts and the building of the gullies? They were built after the arch was finished. I presume the last work would be the making of the road.  
 6346. Would it not be likely that on 18th July the whole of the arch would be finished if the whole work was finished on 25th July, because you had then to repair the road and make it good, and to construct the gullies and connect them with the culvert;—would it not be likely, if the work was completed on 25th July, that the arch was finished on 18th? Yes.  
 6347. So that if Mr. Hickson wrote in the manner quoted by Mr. Parkes just now that would be quite correct? Yes; in any case Mr. Hickson had the first part of the arch to go upon before he wrote that letter.  
 6348. You are not in a position to say that he had not the whole of the arch to go upon? No.  
 6349. Supposing that on 18th July he wrote these words—"I might state I have just completed, with the permission of the patentees, a culvert on the Parramatta Road built on this principle with most satisfactory results financially and otherwise"? I may have informed him that the arch was completed.  
 6350. Do you not think it possible that you did? Probably I did.  
 6351. You have tested the arch within the last few days? Yes.  
 6352. You have made a careful examination of it? Yes.  
 6353. Did you find the arch as it was when you constructed it? Yes; it is absolutely intact; I could not see a flaw in it.  
 6354. You regard the arch as a success then? Yes.  
 6355. *Mr. Gummow.*] How long has the arch been built? Two years nearly.  
 6356. Do you consider that there is any likelihood of its giving way now after standing two years? None whatever.  
 6357. What is the quantity of the cement mortar in the arch?  $5\frac{3}{4}$  cubic yards.  
 6358. What have you put down as the cost of the centering? £6. That would be for a 14-ft. length.  
 6359. In constructing this work in short sections, you did not continue the whole 55 feet? No; the work was done in four sections.  
 6360. Would it have made any difference if the work had been done in one length? It was better to do it as we did it. We had to consider the traffic.  
 6361. But having regard to the question of the continuity of the whole work? It would not make any difference.  
 6362. Doing the work as you did in broken strips, it was absolutely sound? Yes.  
 6363. *Mr. Parkes.*] Would it have been much more costly, or otherwise, to put in a 14 or 9 inch brick arch instead of the Monier arch? I have not made an estimate in connection with brick arches, but I should imagine that they would cost more than the Monier arch.  
 6364. Very much more? I cannot say; I have not run out an estimate.  
 6365. *Mr. Davis.*] Since you constructed this Monier arch in Strathfield you have looked further into the question? Yes.  
 6366. I believe you wrote a paper for the Royal Society, which so far, however, has not been read at their meetings? No.  
 6367. That paper contains a good deal of valuable information in connection with the Monier arch, does it not? Yes.  
 6368. Would you hand it to His Honor? Yes. I have not read it before the Royal Society, but I thought it would be of interest to describe this arch, because it was the first one built here.  
 6369. *His Honor.*] The contents of the paper are, as far as you know, an absolutely correct statement of what you have learned from experience, and also worked out in theory? Yes.  
 6370. *Mr. Parkes.*] Is there a direct reference to this particular culvert in the paper? Yes; it contains a description of it.  
 6371. Does the paper deal also with its comparative cost? Yes.  
 6372. *His Honor.*] Will you kindly read the paper? Yes.

#### THE MONIER SYSTEM IN BRIDGE CONSTRUCTION.

It will probably be of interest to have a short description given of a small culvert built in July, 1894, on the "Monier" system, on the Main Western Road, at Strathfield; for, with the exception of an experimental arch of 30 ft. span, built and broken by Messrs. Carter & Co., at North Sydney, in May, 1894, this is the first structure erected on this system within the Colony. But, before describing this culvert, it would, perhaps, be as well to explain the advantages of the new method over older systems, by quoting from a paper on the subject by Professor Bauschinger, translated from the German by Mr. Baltzer, of the Sewerage Branch:—"The principle of this method of construction is to increase the extremely small tensile strength of cement and its mixtures, which is to its compressive strength in the ratio of 1 to 10, by imbedding wrought-iron bars in the mortar, in such places where the construction is subject to tension. The compressive strength of a mixture of 1 cement and 3 sand is from 2,000 to 2,450 lb.; the tensile only 200 to 245 lb. per square inch.

"The iron bars used are round, from  $\frac{7}{8}$  in. to 1 in. diameter, as found necessary, and are so placed that the stronger are in the direction of the tension, the thinner resting on the former, usually at right angles to them, thus forming a lattice-work. The bars are only held together at their intersections by thin binding wire, just sufficient to hold them in position during the process of packing the cement mortar round them, which will keep them in place when once set. If not sufficiently long the bars are jointed by a very simple method. They are so placed as to overlap each other by twenty times the diameter of the bars, and then tied together. The cohesion between iron and cement, which is, according to Professor Bauschinger,\* of Munich, 500 to 600 lb. per square inch, and which is not diminished by heat, is quite sufficient to form a bond. The lattice work is calculated to withstand all the tension the structure is likely to be subjected to. To achieve this it is only necessary to take the bars in the direction of the tension into consideration, as the others are only to distribute the pressure equally over the former. When the iron structure is finished, the cement mortar, usually of one cement to three sand, is pressed through the meshes in convenient thicknesses, of not over 9 inches, on to the centering, which is generally  $\frac{3}{4}$ -inch clear of the iron, and well rammed. In setting, the cement mortar shrinks and gets a firm grip round the iron; and as the cohesion between the two materials is very great, the whole forms one homogeneous mass. The physical properties of this combination are very favourable. The co-efficient of expansion of cement mortar is from 0.000137 to 0.000148, that of iron 0.000145 or nearly the same; and, even if a small difference should exist, the elasticity of the mortar is sufficient to equalise the difference. Further, in this combination the iron loses its unfortunate liability to oxidation, as cement has proved itself one of the best preservatives of iron. The very thin layer of cement surrounding the iron forms a silicate with it, very difficult to separate, which explain why iron in cement mortar does not oxidize. Not only does cement preserve iron, but it actually frees it from

\* Cohesion between cement and iron = 500 to 600 lb. per square inch; cohesion between compo. (3 to 1) and iron = 336 lb. per square inch.

from rust; as experiments have proved that iron bars covered with rust, if placed in cement mortar, become after a time perfectly clean. A structure of the foregoing description consequently combines all the good qualities of stone, its strength and immunity from injury by the weather, with the elasticity of the iron, and daily increases in strength rather than deteriorates. The advantages of this system, compared with other methods are." W. Smith.  
29 June, 1896.

- "1. Quickness of erection, without prejudice to durability and security of the work."
- "2. Immunity from injury by water."
- "3. Extraordinary power of resisting very high and variable temperatures."
- "4. Great strength."
- "5. Lightness, as compared with other structures in iron or concrete alone."
- "6. Saving in space."
- "7. Cheapness and neatness."

Following on the above statement in Professor Bauschinger's paper are numerous photographs and descriptions of railway and road bridges already constructed in Austria, Germany, and Switzerland. Before any work was undertaken in New South Wales under this system, Messrs. Carter & Co. built the before-mentioned experimental arch, which was of 30 feet span and 5 feet wide, with a versed sine of 3 feet; and the thickness of the arch at the crown was 4 inches. The mortar of which the arch was constructed consisted of one part cement to three parts sand; the bars in the line of tension were  $\frac{1}{4}$  inch diameter, while the cross-bars were of  $\frac{3}{8}$  inches in diameter, forming a lattice-work of  $2\frac{1}{2}$  inch mesh. An evenly distributed load of  $11\frac{1}{2}$  tons was placed on the arch, which caused a deflexion of  $\frac{1}{8}$  inch, or equal to a load of 210 lbs. per square foot. The arch remained intact, but unfortunately one of the abutments showed a slight movement.

The loading was then removed from that half of the arch adjoining the sound abutment, and the other half was loaded up to  $7\frac{1}{2}$  tons, when it broke. This would be equal to a loading of 274 lb. per square foot.

Taking into consideration that one of the abutments was too weak, and that this very sensitive arch was, for half of its length, without loading or stiffening of any description, the test can be looked upon as fairly satisfactory.

The invert and walls of the culvert at Strathfield are built of concrete, to the proportion of 5, 2, and 1, with a Monier arch 4 inches thick in the centre of cement mortar, composed of 1 part of cement to 3 parts of Nepean sand. Embedded in this mortar was a lattice work of 6-inch mesh, the rods in the line of tension being  $\frac{3}{8}$  inch in diameter, while the cross-bars were  $\frac{1}{4}$  inch diameter. The rods were tied at each intersection with binding-wire, and the under side of the lattice-bars were placed  $\frac{3}{8}$  inch from the intrados of the arch, and were maintained in this position during the ramming into place of the mortar by wooden chocks  $\frac{3}{4}$  inch deep, resting on the centering and supporting each intersection of the bars; these were withdrawn as the mortar of the arch was worked up to them. The lattice was also suspended by wires secured to temporary beams made to span the whole of the work. On the mortar being rammed into place round each of these suspending wires, they were cut off flush with the top of the mortar and left there. (It is now seen that a simpler and more effective means of maintaining the lattice-bars in their proper position during the ramming of the mortar could be arranged for, by making a large plate of neat cement of the required thickness, and breaking it up into small pieces about the size of a penny or, perhaps, a little larger, and placing one of these pieces under each intersection of the lattice-bars, and leaving them in: the rough edges of these broken parts would bond well with the fresh mortar.) When the first length of this arch was finished, and through a misunderstanding, the heavy traffic of the main Western Road was allowed over it when the mortar was only six days old: the result, however, has been in every sense satisfactory. Not the slightest movement or crack has taken place, although the whole of the traffic over this culvert for five weeks had been confined to a 9-foot width: and it is worth mentioning that, when the mortar was only ten days old, a heavy team from the Western districts, drawn by nineteen horses, and weighing  $9\frac{1}{2}$  tons, was taken over this culvert, with the result that the arch has retained exactly its original versed sine, while the mortar was not cracked or injured in the slightest degree.

The actual cost of constructing this culvert (exclusive of the removal of the old brick structure), which is 54 $\frac{1}{2}$  feet long, of 5 ft. 6 in. span, giving a waterway of 14.75 square feet, and including four gully shafts and three pipe connections, was only £114, while the construction of culverts of equal length and capacity, in which brick or concrete and WI buckled plates were used, has hitherto cost about £165.

Since writing the foregoing in August, 1894, several papers have been written on this subject, all of which go to prove the great value and economy of this system; which, although somewhat new to Australian engineers, has, under the name of "Bordenave or Sidero-cement System," been in use in France for upwards of forty years. A description of the system under this latter designation is given in vols. CXL, p. 413, and CXVII, p. 407, of the Minutes of Proceedings of the Inst. C.E., which almost entirely corresponds with Professor Bauschinger's account of the Monier system.

In vol. cxx Min. Pro. Inst. C.E., Mr. R. P. T. Tutein-Nolthenius makes the following observation in reference to a culvert built on the Monier system in Belgium in 1893:—

The author investigated by mathematical analysis the stresses and strains set up in the material, and became convinced of its trustworthy character, and also quotes several instances of its successful application.

In vol. cxi, p. 414, Minutes of Pro. of Inst. C.E., M. Mamy states that, among the advantages claimed for this system for water works, are that the metal is protected from deterioration, being everywhere embedded in cement, and that no vegetation or deposit of any kind occurs on cement in any climate.

6373. *Mr. Parkes.*] Did your office know anything about this Monier system before Mr. Baltzer introduced it? He was the first person who mentioned it to me.

6374. You did not know anything about it before that? No; but I had heard that a paper had been read at the Engineering Association some time previously. I had not seen it.

6375. How long before? I do not know.

6376. By whom was it read? I forget now. I may have heard at the time.

6377. *His Honor.*] Have you gone into the question of the proper sand to use for mixing with cement in compo. or concrete? Yes; I had charge of the testing of the cement in the Department some years ago.

6378. What conclusion did you come to as to the proper sand to be used in making compo. or concrete? Either clean river washed sand, similar to the Nepean River sand, or the best crushed sandstone.

6379. As to the best crushed sandstone, have you tested compo. or concrete made with it for any length of time? No; I used to use the Nepean River sand only when I tested the cement in the Department.

6380. What tests have been made in which crushed sandstone has been used, do you know? I have seen the results of many tests in which it has been used, but I do not remember them.

6381. They would be tests, I suppose, for tensile power and the power of standing compression, but they would not be tests in which shrinkage would come in as an element? I do not remember now. I do not remember the difference in the shrinkages of the different sands.

6382. Have you gone into the question whether the Sydney sandstone does not contain so much clay as to render it a bad sand for the making of concrete? No.

6383. *Mr. Davis.*] Supposing the sand contained clay, would it not be detected in both the compression and tension tests? Yes.

6384. Would not a quantity of clay materially affect the strength of the compo.? Yes.

6385. And it would be seen in both the compression and tension tests? Yes.

6386. If you tested any sand, and found that it stood a higher test than the Nepean sand, would you be content to use it? Yes, if I knew it was good sand.

6387. You would be satisfied to use it if it stood a higher test than the Nepean sand? Yes.

6388. You would feel assured from the test that you were using a good sand? Yes.

Norman Selfe sworn and examined :—

- Norman Selfe. 6389. *Mr. Parkes.*] You are a civil engineer? I am.  
 6390-1. Of considerable experience? Of many years' experience.  
 29 June, 1896. 6392. Have you, in your experience, had to do with patents and reports on patents? I have had a very extensive connection with patents. I report, on the average, upon over a hundred a year.  
 6393. For whom do you report? Principally for the Department of Justice.  
 6394. Have you examined the Letters Patent in the case of the Monier arch? It has never come before me officially, but I have just glanced at it.  
 6395. You have seen the specification? Yes, casually.  
 6396. Will you tell His Honor what is your opinion of that patent? I could not give you an opinion from a mere perusal of the documents. I may not have read it correctly. I have formed a certain general opinion of it, but I would not presume to quote that opinion in a case like the present without going into the matter thoroughly.

John Carter recalled and further examined :—

- J. Carter. 6397. Have you a private account at the Bank at North Sydney? Yes.  
 29 June, 1896. 6398. It has nothing whatever to do with your business? Nothing whatever.  
 6399. Did you produce all the receipts you had to the order of the Commission? All the receipts we had.  
 6400. I suppose there cannot be more than one fourth of what you should have? I could not form any estimate. I found more than I thought I had. I found some of them in an old shed. I hunted up all I could lay my hands on.  
 6401. Did you ever at any time keep these receipts filed up? At one time, certainly.  
 6402. Did you not keep them in periods—in periods of six months or for periods of a year, for instance? I have kept some perhaps for twelve months.  
 6403. Can you produce the statement for which you were asked by the Commission as to the merchants from whom you purchased cement? No. The only merchants from whom we have purchased to my recollection are Parbury and Henty.  
 6404. Have you purchased any from the firms of Gibbs, Bright, & Co., and from Austin? Yes; years ago.  
 6405. Were all the accounts for cement purchased paid for by cheque? Yes.  
 6406. The cement was not paid for in cash at any time? I do not remember any cash transaction. I cannot think of any reason why it should be so.  
 6407. *His Honor.*] Do you draw your cheques in the name of the payee or by numbers? In the name of the payee.  
 6408. *Mr. Parkes.*] Do you not keep a record of the material sent to each job? No.  
 6409. How do you know then in the end whether you have more or less material used than you anticipated? We keep no record of that sort.  
 6410. If you take up a job do you not estimate how much material you will want and how much labour will be required;—do you not go into your material in detail? No.  
 6411. You would trust to chance? No; but I should prefer that you asked these questions of Mr. Gummow.  
 6412. You do not know whether Mr. Gillan has an account in the Bank of New South Wales? I have no idea.  
 6413. Has he not one at the Bank of New Zealand? He very probably has; I think we have all been dealing with that bank, but I could not say definitely. I have no knowledge of Mr. Gillan's having an account there. If I ever knew it I have forgotten it. I know absolutely nothing about Mr. Gillan's private business.

Frank Moorhouse Gummow recalled and further examined :—

- F. M. Gummow. 6414. *Mr. Parkes.*] Do you separate your material from your labour in going on with a job—I mean in estimating what it is going to cost you? No.  
 29 June, 1896. 6415. You trust to chance as to how it will come out? There is no chance at all.  
 6416. Why? Because the contract is a schedule rate contract. We take out our quantities, and then we make an estimate of what the quantities are likely to be. They may be increased or decreased 20, 50, or 100, per cent.  
 6417. There is no real finality in the case of Government contracts then? Not in tendering.  
 6418. You cannot tell what it is actually going to run out at;—if it started at £20,000 it might run out at £40,000? That could be done.  
 6419. There is no finality to it? No.  
 6420. Mr. Gillan was originally your partner before you joined Carter & Co.? Yes.  
 6421. Could you tell me whether the property at Dulwich Hill belonging to Mr. Gillan belonged to him absolutely or to the firm? What property do you refer to?  
 6422. I mean the property which Mr. Maddison, I think, said Mr. Gillan owned at Dulwich Hill? The firm have never had anything to do with it.  
 6423. It is entirely his own property? I think so.  
 6424. Do you know anything about Mr. Gillan's affairs or business movements? No.  
 6425. Do you know whether Mr. Hickson, junr., while here kept a banking account? I know that he did in Adelaide.  
 6426. At what bank did he keep it there? The Bank of Australasia.  
 6427. You do not know if he had an account here? I believe he had an account at the Bank of Australasia here, but I am not certain. I know that he had such an account at the Bank of Australasia in Adelaide because I often paid in cheques to his credit there, he being at the time out of Adelaide.  
 6428. Have you at any time in the working of your business had an overdraft at the Bank of New Zealand? Yes.  
 6429. Did you lodge any property securities against it? Not to my knowledge.

6430. I suppose the North Sydney property was not lodged against it? No.

6431. *Mr. Smith.*] You heard what Mr. Hickson, junr., said about the moneys received by him from the firm;—I suppose that statement was correct? Yes.

6432. Your firm has not paid him anything beyond the amounts to which he was entitled—beyond the amounts which they should have paid him? No.

F. M.  
Gummow.

29 June, 1896.

WEDNESDAY, 1 JULY, 1896.

Norman Selfe recalled and further examined:—

6433. *Mr. Parkes.*] You are a M.I.C.E. and have had considerable experience in patent matters? Yes, very considerable experience.

N. Selfe.

6434. You have examined the nature of the patent in the case of the Monier arch have you not? I do not know anything about the Monier arch, but I have examined Carter, Snodgrass, and Baltzer's patent. The name of "Monier" never came before me. (*Vide Appendix No. 18.*)

1 July, 1896.

6435. *His Honor.*] The word "Monier" does not occur in the patent itself? No.

6436. You have prepared a report? Yes. The patent was handed to me and I reported on its value as a patent.

6437. *His Honor.*] The report you have prepared expresses your opinion as a patent expert? Yes.

6438. It would be in effect your evidence as an expert? Yes.

6439. *Mr. Parkes.*] Will you oblige His Honor by reading it? Yes.

In accordance with your instructions, I have examined a patent No. 4,084 of 3rd November, 1892, issued to Messrs. J. Carter, D. G. Snodgrass, and W. Baltzer, and find,—

1. The patent title is, "Improvements in concrete and cement mortar building and other constructions and manufactures."

2. The patentees are not the original inventors, but claim under a communication from abroad.

3. The essence of the alleged invention consists of the use of a lattice or skeleton work of iron bars or rods imbedded in the concrete or cement of a structure, such bars being secured in their required relative position to one another by being tied at their intersections.

4. The general use of iron imbedded in concrete or cement for the purpose of adding strength and stability was known and practised by the introduction of beams, rods, bars, or hoop-iron, before the application for this patent; but the patent is confined to the use of such bars as in (3) crossing one another and tied at such crossing.

5. The word "binding" is used in the body of the specification to indicate the method of fastening at these intersections, but no such term is used in the claims.

6. In consequence of a report by the Examiner of Patents that the specification as originally submitted was anticipated by Letters Patent 3,147, the patentees, by their agent, voluntarily altered the wording of the claims. No. 3,147 is a case which shows in a more elaborate way than 4,084 a number of methods of embedding metal rods and bars in concrete, which the applicants admit knowledge of. They must, therefore, have fully considered the matter before they altered their specification and restricted their claims to the special arrangement of lattice bars tied at their intersections.

7. If it be assumed that there is no objection to the specification of 4,084 on the grounds of anticipation or prior user in its amended form as granted, and that it is a valid patent, still, as it secures to the holders nothing more than they claim, it is a patent of an extremely and exceptionally limited scope, because it is confined to the connection of the bars by being tied at their intersections. The word "bind" is not used in either the agent's letter or the claims, while the word "tied" occurs several times in the letter, and is the only one used in the claims.

8. The word "bind" is used in the body of the specification to describe the fastening of two bars together where they overlap when a continuous length is required from end to end of the structure; nothing is said of this in the claim, however. Again, the binding is described as being "of sufficient strength to hold the bars in position during the process of packing the concrete around them," but nothing is said in any part of the specification as to the nature of this binding; whether it is to be a metallic one made with wire, or a binding with a fibrous cord, string, or marlin, made of hemp, flax, cotton, &c.

9. The words "bind," "binder," or "binding," are applied in the arts to fastenings made with both wire (metal) or string (flax), as in the ordinary harvesting machines, but the word "tie" is used in a more restricted sense, and it is hardly possible to "tie" in the ordinary meaning of the word with wire.

10. A reference to the figures attached to the specification shows in Nos. 1, 2, and 3, the intersections of the crossing wires or bars secured by binding wires, with their ends twisted together; therefore, although nothing is said on the matter, it was possibly the intention of the patentees that the word "tie" should apply to a fastening or binding in which a wire is made to encircle the intersection of crossed bars and then have its two ends twisted together in the way indicated by the figures, as well as to an ordinary tie by means of string secured by hitches or knots.

11. If the patentees are given the full benefit of this double system of fastening the bars at their intersections—possibly implied though certainly not expressed—they are still limited to a separate tie or bind at each intersection, because the tie or bind in the figures clearly shows the ends of the binding wire; and the tie alone in the claim clearly implies a fastening which is complete in itself.

12. It therefore does not seem that any stretching of the meanings of terms can be made, which would imply that the claims of this patent cover any system of securing the intersections of the lattice bars by binding or lacing with a continuous wire, in such a way for instance as the crossed wires of sieves and riddles are secured to one another; neither does it cover any arrangement of bars either interlaced or interwoven, or any system of fastening the intersections of such bars by one of the many arrangements of clips or bolts which could be used for such purpose.

13. For the foregoing reasons, and particularly on account of the claims having been deliberately limited to a very definite method of fastening the crossed bars at their intersections, I am clearly of opinion that there are a great many other and equivalent methods of securing such intersections available which are outside the patent; and that a lattice or skeleton work of crossed bars can be built up to be bedded in concrete, and can be lashed, bolted, or clipped, at their intersections, without infringing the patent; and that such lashing or binding can be made of either wire or string, if it is not tied at the intersections.

14. Whether such alternative or equivalent fastening would be of equal value for the purposes of a lattice core for a concrete structure is more a question of engineering than one for a patent expert, and as such I did not understand was referred to me.

6440. *Mr. Parkes.*] Your opinion is then that the Government would have a right to use this lattice work in any form slightly altered as far as the connections are concerned; subject to that alteration, you think it could be used without infringing this patent in any construction of compo. or concrete? The question is one of opinion as to what would be under the patent or not under the patent. The question of fact is that of course any fastening not covered by a patent could be used by the Government or any one else.

6441. Such as bolts or rivets? Yes; anything of that sort.

6442. *His Honor.*] As to your previous experience of the use of anything like this system of iron and concrete;—have you any knowledge of it? No. I could not give any opinion upon engineering matters so far as that kind of thing is concerned. My experience in engineering has not lain with this particular branch of work.

6443. Your experience has lain principally in what? More in metal structures.

6444.



- N. Selfe. 6444. You have not gone into architectural matters? I have been connected more with wharf-building, marine engineering, and so on. I have not had much to do with the building of bridges and aqueducts.
- 1 July, 1896. 6445. You have had a good deal of experience of the effect of compo., cement, mortar, or fine concrete, or whatever it may be called, in relation to iron? A great deal.
6446. I mean in the inner skins of iron ships, for instance? Yes. I have had a good deal of experience in that way.
6447. What has been your experience of the laying of cement, mortar, or fine concrete upon clean plates—has it preserved them from oxidation? The whole point turns upon what you mean by clean plates. If the plates are blue, with fire on them, as it is called—that is, with a skin—the concrete will make a union which will stand violent shocks. I have known vessels come into dock after being on the rocks, and so on, in which cases, except in the immediate site of the collision or bumping, the cement had adhered very firmly. I have known concrete to be knocked off the iron after being there for fifteen years, and where the iron has been found to be as clean as on the day it has left the rolling mills, or on the day on which it was put into the ship; but if there happened to be any rust or incipient oxidation you cannot insure that close union. At the same time it must be observed that the union of cement to a plate is more difficult than the union of it to a bar which it surrounds. In that case it cannot get away. In the case of a plate there is nothing but the actual adhesion. In the case of the enclosure of pieces of iron, such as hoop-iron, which are used in various buildings, the iron is enclosed, and in that case close contact is not of such great importance as in the case of plates.
6448. In that case the grip would give adhesion? Well, the metal is enclosed. It cannot get away. Take the case of a plate on the inside of a ship, if the cement did not adhere closely the shocks to which ships are subject would knock it off. It is put into the bottom of ships to keep bilge-water from many intersections and crossings which could not be cleaned.
6449. And it is found that it does preserve the plates? Yes.
6450. As far as the plates are concerned, it is an important element that the plates should be absolutely free from even incipient oxidation? Yes.
6451. But as to bars enclosed in concrete, you cannot say whether that is so? The bars cannot get away. When the bars are enclosed in concrete it is not a question of adhesion at all, although a very close union will be formed.

James Connor sworn and examined:—

- J. Connor 6452. *Mr. Parkes.*] What are you by trade? I am a bricklayer.
- 1 July, 1896. 6453-4. You were employed for a certain number of years by Carter, Gummow, & Co.? Yes, for a good number of years.
6455. Do you remember for how many? No; I do not know the exact number of years.
6456. On what particular contracts were you employed? I do not know the numbers of the contracts, but I can identify them by the names of the principal streets; I know that I was employed in Victoria-street, and also at North Shore. The contract at North Shore is, I think, No. 79.
6457. Were you employed upon 79A? No; but I was employed at Marrickville.
6458. Were you not upon 79A? No, presuming that 79A is the one which extends to Milson's Point. I was on the first contract on that line, but I was not on the second contract, which I know nothing whatever about.
6459. *His Honor.*] Did you not do any work at all on the south side of the intersection of Mount-street and Alfred-street? No; I was working on the other side, from the outfall to Mount-street—upon the large job.
6460. *Mr. Parkes.*] Were you on the Glebe contract? No; when that was going on I was working for Gummow, Gillan, & Co. at Camperdown.
6461. You do not mean the Annandale contract? No; I mean the Camperdown contract. I do not know the number of the contract, but it runs along to the Newtown railway bridge, and is intersected by the Prince Alfred Hospital sewer at Camperdown.
6462. Did you work at shafts Nos. 12, 13, and 14, at North Shore? There was a No. 12 on the contract. I was on, but no 13 and 14.
6463. No. 12 would be the last shaft at this end? Yes.
6464. Do you know a man named Dawson? Yes.
6465. Did you work with him? Yes.
6466. Have you heard through the newspapers or from any other source the nature of the evidence he gave? I have read every word of it as printed in the newspapers.
6467. Were you working with him when he left unpacked the drums to which he referred? No; the only time Dawson worked with me in the packing of drums was on the Camperdown job. In that case he did the labouring to my bricklaying.
6468. Who was doing the bricklaying work with Dawson upon Contract 79A? I was never there; I know nothing about it. I believe I worked there about half a day to finish a shaft. I think I remember being sent there from Marrickville to do that work, but that was my only connection with it.
6469. I believe that on several occasions Inspector Reid complained of your work upon Contract 79? Yes.
6470. What was the nature of the work of which he complained? I really do not know. I know that reports went into the Department the nature of which I never knew. I never knew anything about their contents until I read of the evidence given at this Commission.
6471. Did Reid not speak to you about bad work? No, not about bad work.
6472. Did he speak to you about the way in which you were doing your work? No.
6473. Reid never did that, you say? He never spoke to me about the brickwork at all. Any charges he made were made to the Chief Inspector.
6474. Were you not acting as a sort of foreman? Yes, I was foreman.
6475. Foreman of bricklayers? Of the bricklayers only.
6476. Not including the packing? All the packing in connection with the brickwork. Of the concrete work I know nothing.
6477. Did you ever observe any bad work going on upon Contract 79? No, nor on any other contract.



6478. You never saw bad work going on? No, and I am positive there is no bad work on that contract.
6479. You never saw concrete going into the work defective, as regards the proper quantity of cement? Never; although as a rule I should not see the concrete mixed. J. Connor.  
1 July, 1896.
6480. Reid has sworn that he saw you, the foreman bricklayer, and Dawson putting dry stones down a shaft and that he complained? That is true.
6481. He says he stopped you and told you to mix the proper materials? Yes. There is something in that.
6482. That was true? What I mean is that he made a complaint.
6483. Did he not speak to you about bad work? Well, he made a charge that we were doing it.
6484. He told you that you were doing bad work then? He said that we were shovelling down dry stone.
6485. He did therefore question you about bad work? Yes. When you spoke of bad work I thought you meant in connection with the brickwork.
6486. But you were acting as general foreman upon Contract 79, were you not? Yes. I looked after all the brickwork and the packing in connection with it.
6487. Did you ever say with reference to Reid, "Take no notice of him; he is only a damned buck navy"? Never.
6488. You never used those words? No.
6489. Did you make any remark to that effect? No, nothing to that effect.
6490. What did you say? I was working down No. 9 shaft. There was a labourer with me named William Hutchinson. I set out for the shaft, and at 1 o'clock we came up to No. 6 shaft both together. Hutchinson came with me, so that if assistance were required he could give a hand. When we came to No. 6 shaft Dawson said he required another half-gauge. I said, "Hutchinson, you had better give him a hand and put down the material." Henderson, a bricklayer, was also giving them a hand, so that they might get away home earlier. They then started to mix up the gauge of concrete. Hutchinson took up a fork and started shovelling the stones where they were broken. Henderson took a shovel which was on the board to shovel on the stones from where they had been thrown after they had been broken. Reid, speaking to him, said, "You will have to take a fork." Henderson said that the metal had been forked. Reid said, "The specifications say it must be forked." Henderson repeated that that had already been done, and he said, "What more do you want." Then they barneyed away, and finally Reid appealed to me. I was standing at the side of the shaft, and he asked me if I would stop him. I said that I would not. I said I did not see any harm in what the man was doing. He was simply shovelling on stones, which, so far as I knew, no man I had ever worked under would object to.
6491. You say you did not see the concrete being mixed. No. As a rule I did not see the concrete being mixed.
6492. You did not see all the concrete mixed on Contract 79? I should have to be at every shaft.
6493. What shaft were you at? I went to wherever men were working.
6494. But you did not see the concrete mixed throughout the job? Not all the concrete. If I happened to come forward when they were mixing the concrete I would see them. As a rule I work with the trowel in the drive continually, and as the man who mixed the concrete would be on the top, I never saw it done at all,—that is, on contracts generally; but I did see the mixing sometimes upon Contract 79.
6495. Do you know the bricklayer who worked upon Contract 79A? No.
6496. You swear that you never saw any defective work on 79 at all? I never saw defective work on any job I was on. I can safely say that it was never done on any job I worked on.
6497. *His Honor.*] You did not explain the first question as to the dry stones going down for the packing of No. 6 shaft? That evening there were, I think, either four or five batches of concrete put down to level up the brickwork. Dawson came to the shaft and asked me to pull him up, which I did with the engine. I said, "What do you want?" He said, "I want another quarter-gauge." I said, "Are you sure you do not require half a gauge?" He said, "No." "Then," I said, "a couple of barrow-loads will do, and if that is so, you had better start shovelling it forward, and I will give you a hand." I could not give him a quarter-gauge, as we had no gauge for a quarter. A 16-foot box would make a full gauge. Then there is an 8-foot box for sand, and a 2-foot box for cement. Knowing that I had not a gauge-box to make a quarter-gauge, and seeing that I could not make 5, 2, and 1, I said, "There is no help for it. We must guess it." There was some of a gauging of compo. lying alongside the shaft. There was one small bucket—at least, so Dawson told me at the time. I said, "You had better use it. I do not like to see it left; use it. It can be put down with the metal, and it will surely make it as good as it ought to be."
6498. Did Reid turn up while this was being done? Yes. The distance from where the stone was from the shaft would be about the length of this room. We had to start shovelling the compo. on to the stone, and mixing it up to throw it down. When we were shovelling the stone down towards the shaft to mix with the compo. he accused us of throwing dry stones down. I said, "We are not throwing dry stones down—we are mixing. If you like I will let you down the shaft, and if there are any dry stones there I will give £5 to any hospital you name." He said, "I do not want to go down the shaft. I am perfectly satisfied." I said, "I am not satisfied that a man should make charges which are false." He said, "I do not care about that." There were two men standing on the other side of the road, and I said, "Will you accept the evidence of these men if I bring them forward?" He answered, "I am perfectly satisfied." I said, "Then I shall have to be satisfied. You must make your accusation." That is all that happened. As a rule, if the work would not take the half-gauge we did not put in any at all, but let it stand over until the following shift. I remember going down No. 7 shaft with Mr. Boys, the engineer. We found that the labourer in the preceding shift had not packed up full. He could have put in another half-gauge. Mr. Boys said, "I do not like this. Will you look into this matter, and see that the brickwork is levelled up in each shaft?" I said I would. That was the cause of the quarter-gauge being used at all. I had given my word of honor to Mr. Boys to see that the work was levelled up, and I had it done.
6499. *Mr. Smith.*] Do you know a man named Crawshaw? Yes; he is a bricklayer.
6500. Did you ever work with him? Yes; he was working on Contract 79 too.
6501. Was he working on 79A also? I believe so; I have heard from outside sources that he was there. Personally. I cannot say, because I was not there myself; but I believe he was bricklaying there.
6502. As to Dawson, did you ever hear him threaten the contractors in any way? Yes.

- J. Connor.  
1 July, 1896
6503. What did he say? I was working on the telephone tunnel in Pitt-street, and he was working on 79 A. I believe he was working with a man named Crawshaw, from what he told me. He said to me, "Do you know what we did yesterday?" I said, "No." He said, "We did fourteen drums yesterday." I said, "You could neither have built them nor packed them." He said, "We did five, and we never put a shovelful of concrete into the packing." He also said, "It is all marked, and if Gummow does not give me a job at Annandale I will go to Varney Parkes, whoever he may be."
6504. When was this? This was about three weeks or a month before Christmas.
6505. Where is Crawshaw now;—have you seen him? I believe he met with an accident at North Shore. I never saw him. I have never seen Dawson since about a fortnight, or perhaps three weeks, after the New Year. When I saw him then he was borrowing ten shillings.
6506. *Mr. Gummow.*] While you were working upon 79, or upon any other of our contracts, did you always have plenty of material to hand with which to do the work? There was abundance of material, and we had a roving commission to use it in any way in the interests of the work.
6507. Was any restriction put upon you in the doing of your work? No restriction at all; the very opposite.
6508. You have worked under a good many inspectors? Yes; nearly every inspector in the Sewerage Construction Branch.
6509. Did you find them all the same class of men to deal with? Personally, I never had any trouble with any of them but Reid. I never was laying bricks in any work which Reid had anything to do with. There, a lot of men were employed, and I never laid a brick at all for a long time. I had to go from shaft to shaft where they were putting in pipes, landings, and ladders, and where there was a lot of work which had to be constantly looked after. In other contracts, I worked with a trowel just the same as any other bricklayer. My foremanship was confined to keeping the time and seeing that the levels were properly given before the men started, but on Contract 79 there was a lot of extra work to do.
6510. As to Reid, what sort of man did you find him to deal with as an inspector? In my opinion, he is a vicious, unprincipled, scoundrel.
6511. How came you to form that opinion? I formed it from the amount of annoyance and disturbance which he caused upon the job with every man on it.
6512. Was there more of that kind of thing than you had seen on any other job? I never had any trouble upon any other job under the Sewerage Construction Branch, and I have been 13 or 14 years on them. During the whole of that time I never had a word with an engineer or inspector.
6513. You gave satisfaction to the engineers and inspectors? I presume so. They never said anything to me.
6514. You have worked under other contractors besides those of our firm? Yes; under Rowe and Smith, Dalgetty, Rochester, Parry and Farley, and Pritchard.
6515. You never had any trouble upon those contracts such as you had upon Contract 79 under Reid? I never had anything at all in the way of trouble upon the other contracts, but on No. 79 it was simply horrible.
6516. Upon the other contracts did the inspectors see that the work was done properly, or did they let you do as you liked? They looked after their business in a proper manner.
6517. Do you know whether Reid came directly to the boards or whether he used other means to try to detect bad work? I heard that he used to slink along, but I never took the trouble to observe whether he did so or not. I heard that he used to post himself behind the trees on the side of the road, but I do not know whether that is so or not.
6518. But you heard that he did so? Yes; I may state one of the reasons why I came to form the opinion I have of Reid's character. I think it was the first night when he came on when he went down a shaft where a bricklayer named Phillips and a labourer named Gannon were working at one end. He remained there the whole night without leaving for a moment to see what was being done at the other end at all. He actually sat on the board, which would be about 4 x 3, and there he remained, the labourer having to put all the stuff, compo. and bricks, past him. If he had acted as any other inspector would act he would have gone to the other end occasionally to see what was being done, because while the bricklayer was laying his bricks there was no need for him to be there. There is no need to watch a man doing 4½-in. brickwork, because when the work is done you can easily see how it has been done. He seemed to want to catch the men like a policeman. That was continually going on during his inspectorship. He was a sort of detective, looking for promotion according to the number of cases he got.
6519. *His Honor.*] I suppose that when that little row took place about the forking you did say something to Reid which was not complimentary? Yes; when he got on to me to stop the man from doing what he was doing. I can assure you, from my knowledge of engineers and inspectors, that no man could have said that the metal the man was shovelling was not of the very best material. It was not only forked metal, but it was the tailings of forked metal.
6520. What did you say to Reid? He appealed to me, as I say, to stop the man from using a shovel, and when he put my monkey up I said, "The real fact is this, Reid, you have never been anything else but a buck navvy all your life, and now that you have been pitchforked into a position of trust you imagine you have a perfect right to browbeat every man you come into contact with." Those are the simple facts of the case.

Robert Rowan Purdon Hickson recalled and further examined:—

- R. R. P.  
Hickson.  
1 July, 1896.
6521. *Mr. Parkes.*] What inquiries did you make as to the positions of Mr. Forrest and Mr. Gillan before you accepted them as sureties in the case of Contract 77? The conclusion I arrived at was formed after a conversation I had some months before with one of the officials of the Bank of New Zealand.
6522. Who was that? Mr. Kane, the manager of the Bank of New Zealand in Adelaide.
6523. Is he an officer of the Bank now? I think so.
6524. Was he an officer of the Bank in March, 1895? He was an officer in 1894, and, as far as I know, he is an officer now.
6525. On what date did you see him? I have seen him several times.
6526. On what date did you make inquiry of him as to the position of Mr. Forrest and Mr. Gillan? The conversation I had with him was as to the firm generally, and it took place, as far as I can remember, at the end of 1893.

R. R. P.  
Hickson.

1 July, 1896.

6527. What position do you say Mr. Kane occupied then? He was the manager of the Bank of New Zealand in Adelaide.
6528. When you accepted Mr. Gillan and Mr. Forrest as sureties did you know they had an interest in the firm? I knew that they had not an interest in that particular contract. [*Vide Appendix No. 28.*]
6529. Did you know that they had had an interest in the contracts of the firm generally? I knew that their names had appeared in connection with other contracts.
6530. Where is Mr. Kane now? He is in Adelaide, as far as I know.
6531. Is he manager of the Bank there at the present time? I cannot say. I have not been to Adelaide for over two years. I remember that he spoke in the very highest terms of all the members of this firm.
6532. Before Mr. Forrest or Mr. Gillan signed the bond did you see them? I do not think I ever spoke to Mr. Forrest or Mr. Gillan in the office in my life. I think I have spoken to Mr. Forrest once and to Mr. Gillan once.
6533. You knew that they had been connected with this firm of contractors, did you not? Yes.
6534. Did you ever have any business communication with either Mr. Forrest or Mr. Gillan before March, 1895? I never had any communication with them at all.
6535. I mean any conversation or communication directly in connection with public business? No; never.
6536. Have they never had any interview with you of any description? I do not think they have ever done so in my office. I do not think they were ever in my office. Mr. Carter and Mr. Gummow were the only two members of the firm who interviewed me.
6537. Did you instruct Mr. Norrie to draw up the bond in this contract? I do not know whether the instructions came from me or from the Under Secretary, but Mr. Norrie must have received instructions from someone.
6538. Did you ever speak to Mr. Carter with reference to the position of his bondsmen? I do not think I did. I could not be certain.
6539. Did you ever speak to Mr. Gummow as to his bondsmen? No; Mr. Gummow was in Adelaide at the time.
6540. Did you ever speak to any other member of the firm about them? No.
6541. How did Mr. Carter submit the bondsmen to you;—was it done in writing? I could not tell you that from memory.
6542. What I want to know is, how you came to get the bondsmen submitted to you? It was done either in writing or verbally. The papers will probably show it. I presume it was done in writing. It is nearly always done in writing.
6543. Could you produce the letter? If such a thing exists.
6544. It ought to be in existence, ought it not? If there was a letter; but I am not sure whether there was a letter or an interview. There is nearly always a letter in these cases, so I suppose there would be one in existence somewhere.
6545. Do you remember where your conversation took place with Mr. Kane? I know Mr. Kane pretty well, and I have had various conversations with him. The conversation I specially refer to took place, I think, on the Adelaide railway station.
6546. Do you know how it came about? We were talking about the firm generally, and as an official of the bank, he spoke in the highest terms of the firm; in fact the expression he used, as far as I can remember, was that he would trust any one of the firm to any extent, and that they were all well-to-do persons.
6547. He was then speaking of the firm in Adelaide, was he not? He was speaking of the firm generally. Mr. Gillan was in Adelaide at the time.
6548. Who were the members of the firm whom you knew to be there? Mr. Gillan and Mr. Gummow were the two who were in Adelaide then.
6549. Mr. Forrest, I understand you to say, was spoken of too? Yes;—he was not in Adelaide.
6550. But he was a member of the firm then? Yes, upon some of the contracts.
6551. [*His Honor.*] What gave rise to the conversation you had with Mr. Kane as to the firm;—what led to their names being mentioned? I think it arose in this way: He knew my son was then in Adelaide, and he said it was a very good firm for a young fellow to be with. In the course of our conversation he spoke about the members of the firm generally.
6552. You had known Mr. Kane before then? Yes, a long time.
6553. Did you meet him by accident on the railway station at Adelaide? I think he knew I was coming and came down to meet me.
6554. That was on your arrival? Yes; I saw him three or four times in Adelaide, I think.
6555. [*Mr. Smith.*] Has the opinion you have expressed in your minute as to these two men being financially sound been confirmed lately? Yes, abundantly confirmed.
6556. Could you specially refer to any way? First of all the bond was taken, and that confirmed my minute. But quite lately I had a communication from the Manager of the Bank here, and he said that if there were any question at all in connection with the matter if I would refer to him he would furnish particulars.
6557. You are referring to the Manager of the Bank of New Zealand? Yes, or to the sub-manager, I forget which. He said he would give any information necessary as to the stability of the firm. I think Mr. Gillan's name was specially mentioned.

John Carter recalled and further examined:—

6558. [*Mr. Parkes.*] Did you ever for any of your jobs—say the Annandale job—buy Cullen Bullen lime? Not for the Annandale job.
6559. But you did buy it for one job? Yes, I believe in connection with the Woolloomooloo job six years ago.
6560. Was it condemned? I believe some of it was.
6561. Was any of that same Cullen Bullen lime which was condemned used on the Annandale job? No. I have had no dealings in Cullen Bullen lime for five or six years, speaking from memory—certainly not for a long period.
6562. You say some of it was condemned on the Woolloomooloo job—you do not remember the date? No, I do not.

J. Carter.

1 July, 1896.

Cecil West Darley re-called and further examined :—

- C. W. Darley. 6563. *Mr. Parkes.*] Before you reported to Mr. Young that Mr. Forrest and Mr. Gillan were good securities for carrying out Contract 77, did you make any inquiries? I made the usual inquiries. [*Vide* 1 July, 1896. *Appendix No. 26.*]
6564. From whom? I think I got my accountant, as I usually do in such cases, to make some inquiry of the Bank. We have always found inquiries in these matters a most difficult and objectionable thing so far as the Department is concerned. All that we can do is to go to our Bank manager and privately get some information from him as to whether the bondsmen are men of good substance or not. My accountant generally makes that inquiry.
6565. Who would that be? Mr. Conley.
6566. Is he in your Department now? Yes. He either went himself or, I presume, sent his right-hand man to make some inquiries for me.
6567. Did you know that Mr. Forrest and Mr. Gillan were contractors under the firm of Carter, Gummow, & Co.? No, I did not. Their names never occurred to me. I never knew until lately that Mr. Forrest had been in the firm. I had never heard of it.
6568. You did not make inquiry in this matter yourself? I have no time to make inquiry into such matters. I never do so.
6569. Did your accountant make inquiry as to whether Mr. Gillan and Mr. Forrest were connected with the firm of Carter, Gummow, & Co.? It never occurred to me to question him at all. The names were mentioned of course, but that practice has now ceased. We do not at present take sureties. It was always an objectionable practice. I always objected to it. We generally made inquiry of the Bank managers. If they reported to us that the men were perfectly useless, of course we did not accept them. I very often refused sureties on such information. As long as I received intimation from the Bank manager that the sureties offered were fairly good men I raised no objection to them.
6570. In getting this information did you in this case rely at all upon Mr. Hickson? No.
6571. You never communicated with him at all on the subject? No.
6572. You got your information quite independently of him? What was done has quite escaped my memory now, but, as far as I can recollect, I acted as I always did in such cases. I presume I sent for my accountant and asked him to make inquiries as to whether the sureties offered were responsible men.
6573. Do you know whether the Bank of New Zealand reported them as being in possession of securities to the value of £12,000? I do not know what the manager of the Bank said as to that.
6574. Could Mr. Conley give us that information? It is very likely that he could.
6575. Is he in the building now? Yes.
6576. *Mr. Smith.*] I understand that when names were submitted as securities it was not the practice to enter upon a detailed inquiry as to the property of the individuals? Never.
6577. You made a general inquiry as to how they stood financially? Yes, my object was to discover whether they were responsible men.
6578. That was the usual practice followed in every case? Yes. It is quite possible that Mr. Conley might have given the Chief Clerk instructions to make the inquiry; but my general practice was to go to Mr. Conley. I could not say what I did in this particular case.
6579. *Mr. Gummow.*] When you are dealing with contractors, and sureties are called upon, does not the question of whether particular contractors you are dealing with have done work in a satisfactory manner beforehand weigh with you? It weighs in my mind more than do the sureties. I look to the contractors more than I do to the sureties.
6580. You say that the contractors you are dealing with have greater weight with you than have the names of the bondsmen? If I have had previous experience of the contractors I care very little as to who the sureties are. That has always been my practice.
6581. Had you any previous experience of the firm of Carter, Gummow, & Co.? I cannot say that I had ever met them before last year—that is before I took over the sewerage contracts; but I had had a very satisfactory experience of yourself. I remember Gummow & Co. carrying out a contract at Potts' Hill; and I never had a contract carried out—I have said it repeatedly before—with more satisfaction by contractors who were working under most difficult circumstances. It was a contract that could not be paying from the cheap rate at which it was taken up. The ground turned out to be extremely hard rock where no rock was anticipated. The contract was carried out in a most satisfactory manner, and the Department was given absolutely no trouble whatever. Having had that previous experience of yourself, I had no hesitation whatever in allowing another contract to fall into your hands.
6582. *His Honor.*] That would be excavation work in connection with the Potts' Hill reservoir? Yes; I may also mention another circumstance. The South Australian Government wrote to me saying that Mr. Gummow had tendered, and in replying to it I told them my experience of him as a contractor. They wrote back to say that they had no hesitation in taking him as a contractor upon my report of him. I speak of men as I find them.
6583. This was a peculiar case—this security given for the permanence of the Monier work. I suppose that, under the circumstances, you would look into the question of sureties more particularly than in any other case? I was dealing with cases of sureties almost daily, and I cannot exactly remember the report. I remember that the substance of the report was that I thought the sureties might be accepted. I must have received a favourable answer as to the substantiality of the men before making the report.
6584. That is the first time you ever had to take sureties for the work in that way? I cannot call to mind a previous case of the kind, or rather a case exactly parallel. I do not think we had a parallel case. We take security for permanence of the work in the case of a reservoir. In that case the contractor has to be responsible when the water is turned on. When we have not been ready to turn the water on, we have taken securities from the contractors in order that they might be paid off, to secure any defective work being afterwards made good, but I do not remember a parallel case to that of Contract 77.
6585. Therefore, I suppose you would be very far from looking on these sureties as a mere matter of form? I certainly made inquiry in the usual way, and I must have received a favourable reply.

William

William Owen sworn and examined:—

W. Owen.  
I July, 1896.

6586. *Mr. Parkes.*] What is your calling? I am a miner.
6587. You have worked for Carter, Gummow, & Co.? Yes.
6588. Did you work for them on Contract 79, at North Sydney? Yes, on the big job.
6589. In connection with that contract, did not the miners communicate with the Department in consequence of the bad air in which they had to work? They sent word to the Department about the air being bad, and got no answer.
6590. Will you tell His Honor how long you worked under those bad conditions? We worked there for months. The air was so bad that we were sick pretty well every night when we got out of it.
6591. Was any air pumped to you? No.
6592. For how long were you working under those conditions? I suppose I worked at that shaft for about three months. That would be No. 10.
6593. *His Honor.*] That is in the hollow of Neutral Bay, is it not? Yes.
6594. *Mr. Parkes.*] For how long were you working in that district? About five or six months altogether.
6595. Do you remember the miners upon Contract 79 getting the secretary of the Miners' Association to write to the Department on the subject of the bad air? Yes; I was the one who asked him to do so.
6596. Is Lynch dead? Yes; he died on the Village Settlement.
6597. How many men out of those who worked upon the contract survived? I don't know. I know that most of them died.
6598. Did three-fourths of them die? I could not tell you that exactly, but I know that a great number died.
6599. How many were working there? There were four working at each shaft.
6600. The high death-rate did not result from disease following upon the dust from guttering and gadding in that case? No; it was from the want of air.
6601. Supposing proper air had been pumped to the head of the shaft, would it have mattered whether the work was blasting or guttering and gadding? It does not make much difference so long as you get proper air. In this case we did not get enough air to drive the fumes of the powder out.
6602. Did not Lynch complain of the fumes of the powder? Yes. There was not enough air coming in to drive the fumes out.
6603. How did you do your work? We had to go down into the smoke, and stop there until the smoke cleared a bit. There was not sufficient air in the drive, as I have said, to drive it out. Sometimes the candles would hardly burn, and if you put them down 20 feet away you would not be able to see the light.
6604. You say that you appealed to the Department? Yes, through Lynch. He sent a letter to the Department, from which he received no answer.
6605. Did you ever make any further appeal? I asked Reid many times to put a fan on with a boy to turn it, and he said, "There are plenty of more b—— men to be got."
6606. Is it not one of the conditions of the contract that good air should be supplied to the men? I suppose it is. We did not get it, and that is all I know.
6607. You swear positively that you did not get it? I did not. I had to leave the job on account of the want of air.
6608. Did you appeal to the Inspectors? No. We never spoke to them.
6609. But you appealed to the head of the Department? Yes, through the letter that Lynch wrote.
6610. How were you paid on that work? It was piece work; before we struck, the average wage came out at 5s. 2d. a day.
6611. What was your contract? I got £2 12s. 6d. for No. 12 and £2 12s. 6d. for No. 10. That would be the running yard.
6612. Not a yard cube? No. The running yard was what we got paid for.
6613. *His Honor.*] Were you guttering and gadding or blasting? Blasting.
6614. You had no guttering and gadding work? No.
6615. *Mr. Parkes.*] What would be the dimensions of the place you would blast out upon Contract 79? We were supposed to drive 3 x 4.
6616. What would be driven on the average? Sometimes 6 inches bigger and sometimes a foot bigger. It would depend upon the holes.
6617. Would it average above a foot bigger? No.
6618. Would it average 6 inches bigger? I could not tell. There would be a big hole here and there.
6619. You say that you were paid £2 12s. 6d. a running yard and for that work the contractors got 78s. per cubic yard? I do not know what they got.
6620. Had you to supply your own powder? Yes.
6621. Had you to pay for your own horse? We had to find a horse.
6622. Did your contract require that you should send the material to the top? Yes. We had to do that.
6623. In the schedule the item "excavation in hard rock, where a 4-inch charge of powder is used," is put down at 78s. per cubic yard? Yes.
6624. And the running yard would be about 4 x 3? Yes.
6625. I suppose the excavation would be 5 x 4? I could not tell what the average would be; in some places it would be 6 inches bigger; in other places a foot bigger.
6626. Would it be fair to take the average at 5 x 4? No; I suppose it would be about 3 x 4 ft. 6 in. We were supposed to drive 3 x 4; but there were big holes here and there.
6627. *His Honor.*] Were you paid for the quantity you were supposed to take out or for the quantity you actually took out? We were paid £2 12s. 6d. per running yard; it would not matter how much bigger it was.
6628. *Mr. Parkes.*] The contractors being paid by the cubic yard would receive payment for about 2 yards, whereas you received payment for only one? I do not know what they got.
6629. In no case were you paid more than £2 12s. 6d. per running yard in the case of No. 10? No.
6630. The miners have no special objection to guttering and gadding work? Not as long as they get plenty of air; it is the want of good air that kills them.
6631. In carrying out guttering and gadding work you can work to a greater extent—that is to say, you can work three shifts? We can work three shifts when we are gadding it out, but not when we are blasting it out, because they will not let us fire after 10 o'clock at night.

- W. Owen. 6632. The work can be done almost as expeditiously by guttering and gadding as by blasting? Yes, just about the same.
- 1 July, 1896. 6633. Did not Carter, Gummow, and Co. once send a petition to the Government? They started a petition when I was on the job about the chopping out. They were going to stop the blasting as some people were complaining, and they started a petition.
6634. Did you sign it? No, I did not.
6635. Do you know whether any of the men signed it? It came round to the shaft, so one of the men told me, but I never saw it.
6636. It was to get the Government to continue the blasting? Yes; to make them continue the blasting.
6637. What do you think of the conduct of the contractors in not giving you sufficient air;—was it an act of goodness on their part or otherwise? According to the men who have already died, I think they ought to be taken up for manslaughter.
6638. You think the contractors were guilty of negligence of human life? I do.
6639. In not providing sufficient air for you to work in? Yes.
6640. You have no ill-feeling to Messrs. Carter, Gummow, and Co.? No; they are as good men as you can work for. They are as good as any of the other contractors.
6641. Did you do this blasting work by piece-work? Pretty nearly all of it. All the daywork at blasting was done on the Marrickville job.
6642. Did they call for tenders? We generally took the job from the contractors at a price.
6643. You say that before you struck you earned on the average 5s. 2d. a day? Yes. In the shaft I was on we made about 10s. a day. Lynch took all the paysheets and reckoned it up, and it came to 5s. 2d. a shift on the whole job for all hands.
6644. Did you ever earn or hear of anyone earning as much as 15s.? Yes; I was earning good money under them then.
6645. Would you make 15s. a day when you were getting £2 12s. 6d. per running yard? At No. 10 we used to make from 10s. to 12s. a day.
6646. And you were paid £2 12s. 6d. per running yard? Yes.
6647. *Mr. Gummow.*] When you were doing this driving were any air-pipes supplied by the contractors? There used to be fans at some of the shafts, but boys were never put on to turn them.
6648. If you were earning 12s. a day, would it not have paid you for the sake of your health, and even your life, to put on a boy at 2s. 6d. a day to turn the fan for the shift? No; because the man working at one end of the drive, perhaps, would not pay, and I could not afford to pay the whole amount myself.
6649. You say you got £2 12s. 6d. per running yard? Yes, after the strike.
6650. What were you supposed to do for that money? We were supposed to drive the running yard.
6651. Were you supposed to find tools? Not drills; but we were supposed to bring the muck to the surface and pay for the horse.
6652. As to the paying for the use of the horse, did you pay for the whole of the use of the horse at the shaft? No; I paid my share the same as the other men.
6653. Did the man at the other shaft pay his share? Yes.
6654. If he were willing to pay his share of the horse hire, do you not think he would be likely to pay as much for getting good air? No; and there were no pipes at No. 10.
6655. Were there no pipes? No. I asked Jack Reid for them scores of times and could not get them.
6656. How much driving did you do on that contract? I drove in No. 10 shaft for three months.
6657. How much did you drive? Twenty feet a fortnight; sometimes more, and sometimes a little less.
6658. Used you to pay for the blacksmith sharpening your tools? No.
6659. Did you pay for your rails and trucks? No; we were supplied with those.
6660. Do you consider that you could have driven more if you had had good air? Yes.
6661. Do you think it was to the contractors' interests to give you good air? I do not know about that. They did not give it.
6662. When you went to the contractors you were in want of a job, were you not? Yes.
6663. Did they make you put in a price against the other men? Well, we took the job off the contractors.
6664. But how did you get it? We went to the office and asked for a shaft, and they would say, "You can have the shaft for so much a yard."
6665. But the contractors did not call for tenders and make you compete against your fellow-workmen? No. They gave us a price, and if we did not like it we could lump it.
6666. And at the price given you, you could earn from 10s. to 12s. a day? We did that at No. 10.
6667. Were you specially good men? We were just about the same as any other men, I suppose.
6668. Did you ever know of any men loafing on the contractors down below? If they loafed at all they loafed on themselves.
6669. You have known them to loaf? I do not know of it.
6670. Concerning the other shaft on the contract—do you know whether the men there got air at all? The engine shafts were all right. Those were the only shafts on the job that I know of which did get air.
6671. Do you know how many engines were at work? There were six or seven, I think. The shafts which had engines were Nos. 8, 7, 6, 5, 4, 3, and 2.
6672. *Mr. Parkes.*] Were the pipes properly connected in any of these cases? No; they would not do it.
6673. Were the shafts from No. 2 to No. 8 all engine shafts? Yes.
6674. Did they get sufficient air in those shafts? Yes; it was pretty good there, so I have heard the men say.
6675. The men in those shafts were satisfied? Yes.
6676. But not in yours? Not in the rest of them.
6677. Did you work in both shafts and drives? I did not sink the shaft.
6678. You were working only in the drives? Yes.
6679. Do you know what was paid to the men working in the shafts? Fifteen shillings when they started and more when they got deep. When they got down to a good depth 17s. 6d. was paid, and it rose afterwards.
6680. Did they ever get over £1 in the shafts? I do not know what they got, but I do not think so.
3681. *Mr. Gummow.*] As to the pipes, who was supposed to put the pipes in? The contractors.

6682. Are you sure of that? I am sure you are supposed to supply us with air as would have to be done in the case of any other mining.

6683. You say you got £2 12s. 6d. per yard;—do you know what that was supposed to be for? It was only for the driving, pulling up the muck, and landing it on the top.

6684. Did the contractors put in the rails for you? No.

6685. You did that? Yes.

6686. Don't you know that as a matter of fact the miners always put in the pipes? They do not—the contractors do it chiefly. Some of the men do it for their own sakes. As a rule a shift is generally allowed for putting in the pipes. In some cases they will do it, in other cases they will not. If they can break through from one end to the other they will not do it.

6687. Did you ever do guttering and gadding work? Yes; on Lemon and Spencer's contract, Woolloomooloo.

6688. How long were you working at guttering and gadding? About two months.

6689. You consider that there are no greater ill effects from guttering and gadding than from blasting if there be no air in either case? They are both about the same. If you get no air you cannot live. It is bound to affect your lungs.

6690. But if the air is good is there no difference? It makes no difference. If there is air it is just the same as mason's work on the surface.

6691. Do you know of any men who have died from the effects of guttering and gadding work? I do not know what they have died from, but I know that plenty of men who have worked on sewerage contracts have died.

6692. Have you ever heard what they have died from? Mostly from bad air, I think.

6693. You do not know whether they have died from dust in their lungs? I think not. The doctor told me that my working in bad air was the cause of my own sickness. He told me that I was not to work any more in bad air.

6694. Then as a matter of fact you do not know what the men died from? No, not absolutely.

6695. As to the cost of sinking the shafts, do you know whether any bonus was given in connection with the sinking of them? £50 is given for "blood money," as they call it in the shafts.

6696. What do you mean by blood money? It is given so that they may run one another to get the shafts down quickly.

6697. If they run one another who gets the benefit of it? Those who get down first.

6698. Do not the others? They get nothing at all. It is like horse-racing.

6699. If you did 10 feet in a shaft in a week would you get no more than if you did 5 feet? Of course you would receive money for 5 feet more. If you sunk 20 feet you would get money for 20 feet.

6700. Is that like horse-racing? There is something very much like horse-racing to get the £50. There is £50 for the men who get down the first 100 feet.

6701. What do the others get? Nothing but the price of the shaft.

6702. If they run a good race with the others do they not get anything? Well, they get the chance of getting in first just the same as a horse would have. If they do not get in first they simply get paid for what they sink.

6703. *His Honor.*] You mean that there is no second prize? I never heard of its being paid, and if it had been paid on the job I think it is likely I should have heard of it.

6704. *Mr. Parkes.*] Do you know a man named Tom Jones? Yes.

6705. What did he once tell you about one of these contracts? He told me that he had filled a sump-hole with a piano case.

6706. Is that on the Glebe job? Yes.

6707. Would that be paid for as concrete? I do not know, but I should think so.

6708. Did he tell you what shaft that was in? I do not remember now, but I know that it was on the Glebe job.

6709. *His Honor.*] Were there any pipes supplied for the shafts—that is to say, if anyone had chosen to lay them, were there pipes supplied for the purpose? In some cases, if you chose to carry them from the yard on your back.

6710. How far away would the yard be? It would be a good half-mile away from my shaft, No. 10.

6711. But there were pipes to be obtained at the yard? They were mostly at the yard; some were at the blacksmith's shop. That would be nearer to the shafts than the yard.

6712. What size are the pipes which are used to supply the air? They would be about 3 inches in diameter.

6713. They would be galvanised-iron, rolled and soldered, I suppose? Yes.

6714. Would they stand the pressure? Of course, if a hole were knocked in them the air would escape. They are ordinary galvanised-iron pipes.

6715. Were any fans supplied at the heads of the shaft? There were none at No. 10 while I was there. I had to leave on account of the bad air.

6716. Did the men ask the contractors for fans? I asked Jack Reid for them, and I know that other men, working at the other end, asked him. In the case of one man he was nearly dead from the bad air, and he had to go home to his friends at Adelong. He simply could not work any longer.

6717. *Mr. Gummow.*] What is that man's name? Big Bob I used to call him; I do not know his surname.

George Dawson recalled and further examined:—

6718. *Mr. Parkes.*] You were present when Mr. McCredie made an inspection of the work upon Contract 79A? Yes.

6719. Did he find all the holes which you say are there? The big hole has not been found yet. Mr. McCredie never went down the sewer in High-street. They never touched that, unless they went down there before I came, and I do not think that is very likely.

6720. Did you do work in High-street? A little. That is where Hansen did the bad work, and got discharged for doing it.

6721. Was not that inspected? Not by the experts.

6722. Did you ever do defective work on other contracts on which you worked some years ago for Carter and Co.? Yes. There are some other places that I know of. There is a sump at Camperdown which was filled with muck, shale, and cement casks up to about a foot from the top.

6723.

W. Owen.  
1 July, 1896.

G. Dawson.  
1 July, 1896.



- G. Dawson. 6723. Where does the Camperdown job run? Through the University Park and the hospital grounds down to Camperdown.
- 1 July, 1896. 6724. Did you work on the Glebe job? No.
6725. Did you work on the Annandale job? Yes.
6726. Was there any defective work done there? Casks which had been opened there were sent over to the shed to be filled with cement which I was told had been condemned. We were supposed to break them up, but when the heads were taken out we were ordered by the ganger, Vandeen, to take them to the shed, where they were filled up with cement from bags.
6727. Do you say the cement was in bags? Yes. It was taken from them and put into the casks.
6728. Where did it come from? It was Cullen Bullen cement, I think; I never noticed the brand.
6729. How did you know that it was condemned? I only know it from hearsay. The filling was done very quietly.
6730. Were there any labels on the casks that were filled? No. They got torn off when the heads were taken out. I helped to carry some of them to the shed to be filled. If they had any labels they would be just the same as those upon the casks we were opening.
6731. The cask generally had the label on the top? Yes. We put the heads of some of the casks back again.
6732. Were the labels intact in any case? No; scarcely ever. With so much handling they got torn off.
6733. How many casks did you fill in that way? Sometimes fourteen, and sometimes eight or nine a day. If the inspector came near us he would make us take up the axe and break the cask. It would depend upon the number of casks which were saved.
6734. Are you aware that Manager Read has sworn that all you said concerning his giving you instructions to do bad work was not true? I saw according to the papers that he had said so, and that he attributed the bad work to laziness. He often chaffed us and said, "You b——s, you do not know how to save cement; I worked four days on three-quarters of a cask at Duke-street, Woolloomooloo, when I was labouring." He would often make a brag of that kind.
6735. What have you to say concerning his denial? I still say positively that he did tell us on several occasions to do bad work. I remember his saying more than once that if we kept using as much cement as we were using we should run out of it and we should then be idle. He would often throw in our teeth that clever feat of his when he worked four days on three-quarters of a cask.
6736. Connors also has stated that he on no occasion saw defective work where you say defective work was done? If I remember rightly, I said that Connors always looked after us, and saw that we did the work fairly well. He has done defective work himself; that he cannot deny.
6737. Can you tell us the place? There is a place in Camperdown, when we were working on night-shift, and where, instead of putting in two rings he put in the toothings and left the rest out.
6738. For what distance? It was only a matter of one or two drums; it happened so long ago that I can't say what the distance was. I know where it is—that is, I know it is between two shafts. I might not be able to go within feet of it, but I know it is there. It was done while we were working on a night shift. I heard Connors say himself that if he had taken the interest in the Marrickville job that he had done formerly he would never have allowed the scamping to go on which his labourer was doing.
6739. Could you point out any of these places, such as the one you referred to at Camperdown. Take the two places,—the place where you say bad work was done, and the place where you say rubbish was put down a sump? I can go to the sump, and I can go between the two shafts where the ring was left out. It happened a good while ago, and I might not be able to go within a few feet of it at first; I know the drive, and I know pretty nearly where it is. The whole of the drive is supposed to be double-ring work.
6740. Did you ever hear anyone talk of defective work upon the Glebe job? Yes; it has been reported that a piano case was put down one sump there; but the man who told me so is dead, so that I could not pick out the shaft.
6741. Did you ever tell Connors that you intended to put the company away because of their bad treatment of you? No. I told Connors as I told others that it was time they were put away,—that they were asking us to do too much of that kind of work. I remember his saying himself that no man could do the length of brickwork which was reported to be done and pack it. He said, "No man could do the quantity of work you are doing at North Shore. We all know that it is not to be done. He also said, "It isn't a case of O'Neill's job. I always told the inspectors on O'Neill's job that they were not packing the work if they were doing that quantity. No man can lay more than 800 bricks a day at the outside, and they were laying 1,000 on O'Neill's job. If they were doing that quantity they were not packing it, they were not doing it properly." He told one of the inspectors that in front of Maddison and Henderson, two labourers, and myself in Emily-street.
6742. Were you working long on the Annandale job? Only on one part of it. I was on the concrete board.
6743. Were they putting in a sufficient quantity of cement there? The work was all pretty fairly done there.
6744. What was the nature of the stone? It was all sandstone from the crusher.
6745. Used they to use in the work the sandstone that came from the tunnel excavation? If the inspector allowed it to be used they used it. Some of it was used.
6746. Did they use it to any extent? I could not say. I was not at the crusher.
6747. *Mr. Smith.*] Was Connors working with you on 79A? Never on 79A.
6748. *Mr. Gummow.*] You say that on the Annandale contract some of the cement was recasked? Yes.
6749. Do you know what the cement, which was put into the casks, was taken out of? Bags.
6750. Are you sure of that? Yes; I was there when Cady started to fill one on a Saturday.
6751. Do you know whether the bags contained condemned cement? That is only hearsay. I was told it was condemned cement.
6752. Do you know whether any of the cement in the bags was used on the contract? I believe there was some of it used before I came there.
6753. You do not know of it yourself? I only heard that it was condemned cement.
6754. As to Reid's telling you that he had worked four days on three-quarters of a cask of cement, where was that? At Duke-street, Woolloomooloo, where he was working as labourer with Connors.

6755. Was he labourer there? I do not know myself, but it was common talk that both he and Connors did it. G. Dawson.
6756. When you were here on the first occasion, you said you went to see Mr. Parkes;—did you ever write to Mr. Parkes before that? No, never. 1 July, 1896.
6757. Did Mr. Parkes ever write to you before then? Never.
6758. Did you write to him afterwards? I have written to him since.
6759. Did he reply to you? Yes.
6760. Have you shown anyone that reply? I have shown one letter to the effect that I was wanted down here in connection with the Commission.
6761. But I mean Mr. Parkes' reply—did you ever show anyone that reply? No, certainly not.
6762. Do you know what the nature of the reply was? I cannot say now.
6763. You are sure you do not know? I am certain I do not; if I knew I would tell you.
6764. Did not Mr. Parkes in his reply write that you were the very man he wanted, or words to that effect? Never.
6765. Did you not show such a reply to someone on the Newtown Bridge? Never.
6766. Did you ever tell anyone at North Sydney that if the firm did not pay you for a full fortnight you would retaliate on them, or something to that effect? I never said a word about it. I did not want pay for work I had not done; I only wanted pay for work which I did.
6767. Did you ever say anything to anyone about a payment which you thought you ought to have received? No; I never said a word about it. I was always paid for my work.
6768. Did you ever say so to Booth, the carter? No, never.
6769. Where did you board at this time? At Marrickville.
6770. At whose house? At Hart's, the plumber's.
6771. Did you ever say to Hart that if the company did not keep you in employment you would make it d— hot for them? Never.
6772. Did you ever say that to Mrs. Hart? Not that I would make it d— hot for them.
6773. That you would make it hot for them, any way? I dare say I said I would do my best to do so.
6774. To do what? To put the job away when I knew that it required to be done.
6775. Did you ever say anything to a man named King? He may have been in the house at the time, but he was not in the company.
6776. Have you any of the letters Mr. Parkes wrote to you? No.
6777. You are sure you never showed any letter of Mr. Parkes' to any one? Never; I showed the summons, that is all.
6778. You did not show to any one a letter in which Mr. Parkes wrote to the effect that you were the very man he wanted? I am quite certain I never did.
6779. *Mr. Parkes.*] Were not all my letters to you written by my secretary? Yes.
6780. They were simply letters asking you to come in at a certain time as I wanted you? Yes.
6781. You never got a letter in my handwriting? No.
6782. You have had interviews with my secretary? Yes.
6783. Did I not tell you when you first came to me that this would be your ruin? You advised me not to have anything to do with it.
6784. I told you to go away and make up your mind thoroughly as to whether what you had told me was absolutely truthful, and as to whether you could stand the ill-feeling which your evidence would bring upon you? Yes.
6785. Is it not the case that you have been unable to get any work since? Yes.
6786. You have found that what I told you was quite true? Yes.
6787. *Mr. Gummow.*] Did you ever try to get upon the telephone tunnel work? Yes.
6788. Did you have a letter in your pocket from any one when you applied? Yes; I took a letter from Mr. Molesworth.
6789. Did Mr. Parkes give you a letter? Yes.
6790. Did Mr. Parkes ever give you an I.O.U. to pay for your rent? No; I do not know what it is.
6791. Did he ever give you an order? No, never. Mr. Parkes would not give a tram ticket.
6792. Did he give you an order to get employment? He gave me a letter so that I might try to get on to the telephone tunnel, but the manager said he would not take any political letter, and that if I had the whole Ministry at my back he would not take me on unless he wanted a man.
6793. *His Honor.*] What is this defective place in the work at North Sydney which you say was never found? It is one of the cavities I mentioned to your Honor.
6794. Did not Mr. McCreddie and Professor Warren open out the exact places you indicated? They found one place, but I was not quite right in my measurements for the other one.
6795. You say there is another cavity still to be found? Yes.
6796. Between shafts 12 and 13? Yes.
6797. Is that the one which you said was about 9 feet long? Yes, fully that.
6798. What do you say about the work in High-street? They never went into High-street. It runs off the main line from shaft 14 down towards the water.
6799. To the east? Yes.
6800. Do you say there is specially bad work in that length? Yes; that is the place from which Hansen was dismissed. There is also some scamping that I did. I remember the inspector saying that if the job was not so near being finished he would not allow them to use some of the stuff which was put in.
6801. What was the scamping that you did? There were some cavities which were not properly filled in as they ought to have been, and if there is anything over the brickwork it is very hard to find cavities.
6802. Is this work in an overflow tunnel which goes into the harbour? No, it is a branch for the houses. It runs into the main sewer.
6803. Can you point out exactly where the sump is which you say was filled with rubbish? Yes; I could go to the place.
6804. Can you fix it by the intersection of any street? No; it is in a paddock. It is at the bottom of one of the shafts.
6805. Do you know the number of it? No; but I can go to it.

FRIDAY, 3 JULY, 1896.

Robert Stewart Littlejohn sworn and examined:—

R. S.  
Littlejohn.  
3 July, 1896.

6806. *His Honor.*] What was the nature of your work at the time Mr. Baltzer was in the Department? I was employed there as a draftsman.
6807. In what branch? In the Sewerage Branch.
6808. Mr. Baltzer was also employed there up to the time he left the Service, I believe? Yes.
6809. Used you to sit next to him? Yes. I sat next to him the whole time that we were in this new building.
6810. Had you an opportunity to see upon what plans he was engaged at different times? I knew exactly what work he was doing always.
6811. I suppose you know the plans of the Monier aqueduct work which were sent in by Messrs. Carter, Gummow, & Co., with their tender for Contract No. 77? I saw the plans once. That was on the occasion of Mr. Baltzer bringing them to the office, when they were finished. He had told me that he was engaged upon some plans; and he used to take instruments home from the office every evening in order that he might work upon them. He said that Messrs. Carter, Gummow, & Co. were to submit them with their tender when they were finished. I only saw the plans once when they were finished, when he brought them and showed them to me. [*Vide Appendix C.*]
6812. Did he do any part of the work connected with the preparation of those plans during office hours or in the office? I never once saw him doing any work in connection with those plans in the office.
6813. Were there not some plans which he formerly prepared connected with the Monier work? Yes. A scheme was got out for Contract No. 112, going across Muddy Creek. They were for an open drain. Those plans were submitted in the proper way when they were finished, with the permission of Mr. Bagge, who knew all about it at the time. Those were the only Monier plans I ever saw done in the office.
6814. Were those done by Bagge's orders? I cannot tell you whether they were made by his orders, but he knew all about the matter. He knew that they were being done.
6815. They were the plans explanatory of No. 3 of the alternate scheme? Yes. Mr. Cutler got out one scheme, Mr. Baltzer got out another, and I also did some of the drawings in connection with that work. [*Vide Appendix B.*]
6816. I suppose you would recognise the plans again if you saw them? Yes.
6817. Do you recognise drawing No. 11, contract 77, the Monier plan, as a drawing done in your office? It is like the plan I saw there, but there ought to be some others.
6818. The heading would indicate that it is not one of the plans you were speaking of? Yes. It is not the plan I saw done in the office.
6819. Was it one of the plans which you at any time saw brought to the office? It might be one of those, but there should be two more drawings. I might have seen this particular drawing, but there seemed to be more detail work in the drawings I saw? I only saw them once.
6820. The question is, whether you think this plan was prepared in the office? I never saw that plan being done in the office.
6821. Can you say for certain that it was not drawn in the office? To the best of my belief it was not drawn in the office. I never saw it in the office to the best of my belief.
6822. Do you recognise the tracing accompanying the alternative schemes? Yes; I did that myself.
6823. From what was the tracing made? It was made from my original plan. I did not do the tracing itself.
6824. Are you sure you did the original plan of which this is the tracing? I believe I did.
6825. This is Monier work, is it not? Yes.
6826. And did you do the Monier for No. 2 alternative scheme? I made the original plan of this tracing.
6827. Which of the plans similar to this was it that Mr. Baltzer did in office hours? The original of the tracing to which I refer was done in office hours.
6828. By whom? By myself, under Mr. Baltzer's orders. He was my senior at that time; I generally got my work through him.
6829. So that he would be responsible for the plans? Naturally.
6830. He did not actually do it himself? He designed it, as it were; he worked it out.
6831. Do you know the second scheme dealt with in Mr. Bagge's report? Yes.
6832. As far as you know it was done at the same time? Yes; it was done at the same time as the tracing. I believe No. 2 was adopted in the case of No. 112, in preference to the No. 3 Monier scheme.
6833. How is it that one of these plans appears here in the form of a tracing? I cannot tell. I know that proper drawings were made—that this tracing was done from my drawings.
6834. Do you know who did the tracing? It would probably have been done by a man named Hollings.
6835. Was he one of the draftsmen in the office? Yes. The figures and the printing look like his.
6836. Have you any idea of what has become of the original? No.
6837. Did you not know why the tracing was made? Most of the drawings were traced in order that prints might be taken from them. We invariably traced all the drawings, and the originals were kept. The plans were used about the office for reference, and to hand to contractors.
6838. Why should there be the originals of the plans in two of the cases and the tracing only in the third case;—you cannot explain? No.
6839. *Mr. Parkes.*] Did Mr. Baltzer make any plans himself? Not latterly.
6840. I mean at the period at which these other plans were made? No; I never saw him making any of those drawings. He had draftsmen under him, and he gave them orders.
6841. Did you see any other draftsman making drawings similar to these at the same time that the other plans were made under Mr. Baltzer's orders? No. All the Monier work ever done in the office was done by myself—by his orders, of course.
6842. Did you make any other plans besides the one before us? No. That was the Monier drawing that was made for contract No. 112.
6843. Were there any others? No.
6844. You are sure there was only that one? Yes.
6845. There were not four drawings made—you are sure of that? No; I cannot remember four. There may

R. S.  
Littlejohn.  
3 July, 1896

may have been another drawing of some details, but the one to which I refer was the only one made in connection with this particular work.

6846. You spoke of seeing drawings with more details;—what drawings were they? They were the ones that were submitted. I was under the impression that the drawings which Mr. Baltzer did in connection with Contract No. 77—I mean the drawings which he did at home—had more details than were on the drawing shown me just now by His Honor.

6847. Can you tell me when the original drawing in the case of Contract No. 77 was made? It was done a good time ago. I have been in the Department five years. It was done under Mr. Hammer.

6848. In Mr. Bruce Smith's time? I do not know. I was not in Mr. Hammer's room at that time.

6849. Would it be three years ago? I could not say, but I should think more than that.

6850. Was it made before May, 1895? I cannot associate it with any particular date, but I should say it was made three years ago.

6851. When were the plans of Contract No. 112 made? They were made shortly after we came in to this building from Lincoln's Inn Chambers.

6852. At what time would that be? Somewhere about three years ago.

6853. Were the plans of No. 112 drawn after you had made out the Monier plans? There was some Monier work in 112.

6854. When were the plans of No. 112 made? On the 22nd February, 1895; at least, that is when they were finished or signed.

6855. The plans for contract No. 77 would have been made before that? The originals\* would, decidedly, I should think.

6856. Listen to this evidence by Mr. Hickson:—

1557. I understand that No. 2 scheme of Mr. Bagge's report had been worked upon then? No, it was worked upon as the result of the calculations then made.

1558. It had been worked upon before you wrote this minute? Yes.

1559. There was only an interval of six months? Immediately after Mr. Bagge's report had been presented the contract for No. 112 was got into hand on the basis of No. 2 scheme.

1560. And it was in the working out of the quantities that you came to certain results? Yes; the results are shown on plans No. 2 and No. 3, which I have put in.

1561. After arriving at these results the office drew the plans of No. 77? Yes.

1562. In drawing the plans of No. 77 were the plans under scheme No. 2 in Mr. Bagge's report borne in mind in any way? We bore in mind the result of our researches as to the cost of work upon No. 2 scheme.

1563. You had it in mind then that, as between No. 2 scheme in Mr. Bagge's report and No. 77, there was not much difference;—is that so? There was not very much. I have had the estimates all run out accurately since, and I can show you how they come out. (*Vide Appendices F and C.*)

6857. If the plans of No. 77—that is, the departmental plans—were drawn before the plans of No. 112, it would have been impossible to make that comparison, would it not? These are not the original plans of Contract No. 77. They were done a long time before that.

6858. Were they not only altered by the taking out of the stone piers and of some concrete? They are a different design altogether. I remember doing one of the series.

6859. *His Honor.*] As to the original plans of No. 77, were they simpler;—was the design a simple one? They were much more elaborate than these. The alteration was made to cheapen the design. I remember that a lot of ironwork was done away with.

6860. *Mr. Parkes.*] What is the date given on the drawing of No. 112, do you say? The 22nd February, 1895.

6861. Therefore, those drawings were made after the drawings of No. 77? They were signed afterwards, but they may not have been made afterwards.

6862. They were made at all events about the same time? Apparently.

6863. *His Honor.*] You were going through the history of Contract No. 77;—how long before the plans for the present No. 77 were drawn were the first plans in connection with No. 77 drawn? I cannot say how long exactly. I had nothing to do with the first scheme beyond seeing it after it was all finished.

6864. How long before you had anything to do with it would that be? I could not attempt to say. All that I know is that I saw the plans when they were finished. They were brought out to be referred to when we were getting out the new designs.

6865. What had you to do with No. 77? I made No. 6 of those drawings, and also one of the detail drawings.

6866. What was the relation which your drawings bore to the original No. 77 scheme? It was intended that the new drawing should supplant it as being a cheaper job.

6867. In what way was the original scheme in No. 77 simplified? I remember that a lot of expensive cast-iron hand-rails along the top were done away with. We got Mr. Bagge to consent to that. There is also a difference in the span of the arches.

6868. Do you mean that the spans were increased in the more recent plans? I think they were increased. It was in the small arches that you see at one end of the White-street aqueduct that the change was made.

6869. Is that the whole of the difference? It was a different construction altogether as far as I remember.

6870. It was cheaper? The change was made with a view to cheapen it, and I believe it did come out cheaper.

6871. *Mr. Parkes.*] Had you not stone and double-pressed bricks in the original design? I believe there was a good deal of stonework.

6872. There were stone cornices? I think the piers were stone.

6873. Were there not cornices? Yes.

6874. Was there any difference in the upper structure as between the original design for No. 77 and the later design? The later design is much simpler.

6875. Could the original plans for No. 77 be produced? Yes.

6876. *His Honor.*] As to the preparation of the Monier plan which was put in or sent in after the tenders for No. 77 were sent in—the plan which explains the lump sum tender of £15,500—what did you hear about that in the office? I understand that you refer to the plans which were sent in with Carter, Gummow, & Co.'s tender. Mr. Baltzer told me that he was going to prepare some plans for them to send in with their tender. He used to take home his instruments every day for that purpose and bring them back

\* NOTE (*on revision*):—By originals I mean the plans executed under Mr. Hammer.

R. S.  
Littlejohn.  
3 July, 1896.

back again in the morning. On one occasion, I remember that he forgot his instruments. Some time after that, I remember his bringing the plans in, and as he unrolled them I remember his saying "I have these plans to-day, so you can look at them." He then showed me the plans.

6877. How many sheets were there? Three sheets. When I was shown the Monier plan this morning I did not altogether remember it, because I recollected seeing three sheets. I do not know whether they were all to be submitted, probably not, because the details would not be required. I know a man who was living with him at the time, and who saw him at night working upon these plans.

6878. Who is that? Mr. Hungerford.

6879. Is he the gentleman who is now in the office? Yes, he is in one of the clerical branches.

6880. Is that Mr. E. Hungerford? Yes. He was living in the same house, and he used to see Mr. Baltzer working upon these plans at night.

6881. Do you know how it was that Mr. Baltzer came to introduce the idea of working out a Monier plan to be submitted with the tender for Contract No. 77? I have no idea at all.

6882. At any rate, it was understood some time beforehand, that such a scheme was going to be submitted by one of the contractors? He mentioned to me that he was going to make a drawing for that particular contract.

6883. Was that known to any of the heads of departments at that time? I do not think it was. As far as I know it was not.

6884. Was it mentioned to you confidentially, or how? Yes. We used to converse a good deal about the Monier work, because I liked it, and I had done more of that work than had anyone else; in fact, I was the only one who ever did any of the drawings. I suppose, therefore, that Mr. Baltzer, thinking I would be interested, mentioned it to me. My seat in the room was next to his, and he casually mentioned the circumstance.

6885. You are referring to the occasion when Mr. Bagge got out the three schemes mentioned when you say that you had had some experience of the system? Yes.

6886. That is the experience you allude to? Yes; but of course I knew about the thing before then.

6887. Before that? Yes. I knew about it privately.

6888. From reading, I suppose? Yes.

6889. Are you an engineer? Yes. I am an engineer, trained in Scotland.

6890. *Mr. Davis.*] Since you prepared the design for Mr. Bagge to submit in connection with Contract No. 112, the plans of the office have been moved about a great deal? A very great deal.

6891. So that it would not surprise you to find that the original of No. 3 scheme which was submitted by him has been mislaid? There have been a number of drawings mislaid.

6892. What are the drawings of Nos. 1 and 2 which have been laid upon the table—are they originals? No; they are heliographs.

6893. Would not those heliographs be made from a tracing similar to that accompanying scheme No. 3? Yes, there would require to be a tracing before the heliograph could be made.

6894. Then, as compared with the heliographs, the tracing would, as a matter of fact, be the more original? Yes, it would certainly be done before the heliographs.

George Forrest recalled and further examined:—

G. Forrest.  
3 July, 1896.

6895. *Mr. Parkes.*] Will you tell His Honor what land you have in New South Wales which is absolutely in your own name? There is none in New South Wales in my own name. I have only an interest in it.

6896. You say you have only an interest in any land in this Colony? Yes. That applies to all the other property we have in New South Wales. We have some vacant sections.

6897. Is the property in your joint names, in a deed? I could not say.

6898. Is it not in Mr. Carter's name? It might be in his name.

6899. As to your New Zealand property, of what value is it? It would be hard to say. I have never had it valued for sale or for mortgage. For one place I was offered £1,000 cash some years ago, and I was offered £500 for another place within the last eight or ten months.

6900. What other places are there? I have some houses.

6901. What would they be worth? It is hard to say. I have also some vacant sections.

6902. What are they worth? I should not like to sell under £2,500, unless I were pressed for money.

6903. Is there any mortgage upon the property? Not a shilling.

6904. Have you the title deeds here? No; they are in New Zealand.

6905. Have you not drawn regularly a salary out of Carter, Gummow, & Co.'s account from September, 1894, to the present date? Yes.

6906. Have you any cash in the Bank of New Zealand at the present time? No; my account would be very low now. There might be an overdraft, but if there is it would be there for the first time.

6907. *His Honor.*] You have had your New Zealand property valued, I suppose, in a round-about way—What I mean is that you have had to pay rates? Yes, the municipal rates.

6908. At what do you value the property for rating purposes? I could scarcely say without looking at the particulars. I know that I pay about £12 a year for rates. I think the rating is 9d. or 1s. in the £.

6909. Upon the annual value? Yes.

6910. How do they get at the annual value of unimproved land? I pay only 2s. 6d. a section.

6911. What value would that indicate according to their basis of rating? It would not matter whether the section were worth £15 or £1,000, all vacant sections are charged alike. In one of the suburbs, I think only 2s. is charged.

6912. Supposing you had one vacant section in the heart of Dunedin, and another vacant section in one of the extreme suburbs, would you pay the same rate on account of both? I could not say what is the charge in the heart of Dunedin, but I know that in different suburbs it is 2s. 6d. per section. In one of the suburbs, as I have said, it is only 2s.

6913. At any rate, the charge does not give any indication of value? No.

6914. Is there not a land tax in the Colony? Yes, but there is an exemption of £3,000.

6915. And your property comes within that exemption? Yes. There was a property tax for six years before we had the land tax. When we paid the property tax the exemption was £500.

6916. That would be some time ago? Yes.

6917.

G. Forrest.  
 3 July, 1896.

6917. What is the salary you receive from Messrs. Carter, Gummow, & Co.? £10 a week.  
 6918. What would it be for? For management and work.  
 6919. Do you receive it as a partner? Yes, as a partner; we all draw alike.  
 6920. Do you receive it whether you are managing or not? If there is any work to do we always draw the same salary.  
 6921. Suppose there is no work to do? We have to do with half salary then.  
 6922. I understand that there are a good many of the firm's contracts in which you have been concerned, and a good many in which you have not been concerned? I have an interest in them all, although my name does not appear in them all.  
 6923. You have actually an interest in them? Yes.  
 6924. Then you have been a partner in the firm all along? Yes; from the first.  
 6925. From how long ago would that be? Over eight years.  
 6926. In cases where your name has not appeared in the contracts, have you been still a partner? Yes; still a shareholder. [*Vide Appendix 20.*]  
 6927. How have you shared in the profits of contracts in connection with which your name has not appeared? Just the same as in the others.  
 6928. Just the same as in those in connection with which your name has appeared? Just the same.  
 6929. *Mr. Gummow.*] As to your salary,—you receive £10 a week? Yes.  
 6930. Have you received that £10 a week from Messrs Carter, Gummow, & Co. since September, 1893? No.  
 6931. How long have you received it, going back from the present date? I could not say from memory.  
 6932. Have you received £10 a week during the whole time you have been employed by Carter, Gummow, & Co.? Yes.  
 6933. What have you received from Messrs. Carter, Gummow, & Co. when we have not been at work upon contracts? I do not know. I know that the salary was a few pounds less than the regular salary some time ago.  
 6934. Do you remember Mr. Gillan and myself going to Adelaide? Yes.  
 6935. Do you remember what we were to get? £10 each, I think.  
 6936. Ten pounds a week? I could not tell you. I know that at one time we had £7, at another time £8, and at another time, £6 a week; then we came back to £10 a week again.  
 6937. Do you know what the remaining partners were to get from Carter, Gummow, & Co.? They were to get half.  
 6938. £5 per week? Yes.  
 6939. In other words, the working partners got £5 per week, because they were drawing out of their capital? Yes.  
 6940. With regard to your being a shareholder for the past eight years in different contracts, in some of the contracts in which members of the firm have been interested, your name does not appear? No; in the case of the largest contract—the Marrickville contract—it does not appear.  
 6941. Do you consider yourself liable to the Government in connection with those contracts in which your name does not appear? No; I do not think they could come upon me.  
 6942. You did not sign any document rendering yourself liable? No.  
 6943. As to this property in New South Wales, do you know whether your name appears as an interested party in that property? I think it was in Mr. Carter's name, but we had a deed.  
 6944. Do you actually know what deed there is;—do you know, as a matter of fact, whether your name appears or not;—can you be sure? I know there is a deed.  
 6945. Who draws up your deeds;—who does that kind of business for you? Mr. Andrews.  
 6946. Would he know? I should think so, certainly.  
 6947. Do you ever remember signing a mortgage upon any property in New South Wales? Yes.  
 6948. Would that bring to your mind the fact as to whether you were an original shareholder in it,—that is, the deed, or whether it is in Mr. Carter's name only? I could not say.  
 6949. You leave those matters to your solicitor always? Yes; and to Mr. Carter.  
 6950. You feel that you can always trust them? Yes.  
 6951. *Mr. Parkes.*] Is not the Bank pass-book produced yours? Yes. [*Vide Appendix No. 29.*]  
 6952. You appear from this book to have drawn regularly the salary of £43 6s. 8d. from September, 1894, up to the present date? Yes.  
 6953. *Mr. Gummow.*] On 16th October, 1894, there is an entry of £43 6s. 8d. from Carter, Gummow, & Co.;—were you receiving that amount from them at that time? I could not say, I am sure.  
 6954. Were you receiving £5 or £10 a week at that time from Carter, Gummow, & Co.? I do not think I was receiving it from Carter, Gummow, & Co., then.  
 6955. Was it from Carter & Co.? I am so mixed up about the matter that I cannot tell you. I have really taken very little interest in it.  
 6956. You were not particular where you got the sum from, so long as you got the £10 a week? I was not.  
 6957. As to keeping the books,—can you explain what books, if any, were kept by the firm, and how their business was managed? The tram table book was the only book I kept. There was no use for books of any other kind so far as I was concerned. We kept the pay-sheets, and I think that is about all we did keep.  
 6958. Did you keep any ledgers? No.  
 6959. Did you keep any invoice books? No.  
 6960. No books at all? No.

James Conley sworn and examined:—

6961. *Mr. Parkes.*] What is your position in the Department? I am assistant accountant in the Department of Public Works. J. Conley.  
 6962. In the month of April or May, in 1895, did you make any inquiries as to the position, financially, of Mr. Forrest and Mr. Gillan? I have no recollection of having done so. 3 July, 1896.  
 6963. If you had done so, would you not have some recollection of it? I think so.

6964.

- J. Conley. 6964. As a matter of fact, you did not make any inquiry, did you? I could not say positively that I did not, but I do not think I did.  
 6965. Nor at any time previously? No.  
 6966. Did Mr. Darley ever instruct you to do so? I have no recollection of his having done so.  
 6967. Do you know of any officer in your Department who received such instructions? No; they would only do so through me.  
 6968. You cannot recollect whether you went down to the Bank of New Zealand to make inquiries? I do not remember making any inquiries concerning Mr. Forrest or Mr. Gillan, but I certainly did not go to the Bank of New Zealand.  
 6969. You never went there for that purpose? No. May I explain that the custom of Mr. Darley, when sureties were submitted, was to send the papers on to me to make inquiry as to the position of the proposed sureties. He was most careful in that respect—that is, that I should carry out his instructions, which I always did.  
 6970. But in this case what happened? I do not remember receiving any instructions.  
 6971. *His Honor.*] You remember what was going on at the time in the way of shifting the office? Yes. There was great confusion at the time. Mr. Darley might possibly have given me instructions, but I cannot remember them.  
 6972. Where were your offices at that time? In the Public Works building. Mr. Darley's time was very much taken up between his offices at the Water and Sewerage Board and this office.  
 6973. *Mr. Parkes.*] Was not Mr. Darley absent at that time? At what time do you refer to?  
 6974. I mean in the months previous to May, that is, in March and April? No. I know that he was in the office up to the 31st March, and I think also up to the middle of April. I remember his going away some little time after that, but I could not tax my memory as to what month it was.  
 6975. *His Honor.*] Was he away at Easter? I think so, but I could not be sure.  
 6976. *Mr. Parkes.*] He might be confusing this with some other occasion, might he not, in speaking about the sureties; he couldn't have given instructions, for instance, if he were not present? Certainly not, if he were not present.  
 6977. It is possible that in giving evidence the other day he was thinking of some other occasion? Yes; he has given verbal instructions on other occasions.  
 6978. *Mr. Smith.*] Is it not clear from the papers I hand you that Mr. Darley was in the office on the 8th April? There is no doubt, according to these papers, that he was there then.

Thomas William Bryant sworn and examined:—

- T. W. Bryant. 6979. *Mr. Parkes.*] You were lately in the Public Works Department? Yes.  
 3 July, 1896. 6980. What were you doing during the time you were in the Public Works Department? I was in the Accountant's office, and afterwards I was appointed general clerk to Mr. W. A. Smith, Divisional Engineer.  
 6981-2. Did you do his financial work? Yes.  
 6983-4. Do you recollect the payments made in connection with the culvert which was made at Strathfield, on the Parramatta Road? Yes.  
 6985. Did you see reported in the daily newspapers the evidence which Mr. Smith gave here concerning that culvert? Yes.  
 6986. What was the original estimate for that culvert? I could not say, but I believe it was £114 or £120.  
 6987. All the accounts passed through your hands? Yes.  
 6988. And what was the ultimate cost of the culvert? Speaking roughly—and I can only speak roughly because I have been twelve months out of the Service—it was from £250 to £300.  
 6989. Would you undertake to pick out the vouchers upon which the payments were made if you had the books? Yes, I think I could arrive at them.  
 6990. Did the sum of money obtained for that culvert run out? The head of the Department may recommend an expenditure of, say, £115 or £120 for a job, and we should be supposed to keep within that amount. But if when we got on to the work we found that we should require extra expenditure, and if Mr. Smith thought that it would not be prudent to ask the Minister for more money, he used to take money from some other grant.  
 6991. In this case was the sum of £114 approved of? By the Minister—yes.  
 6992. And that was not enough? No.  
 6993. Where did you get the plans from? We knew that a similar work was being carried out for Dr. Manning at Callan Park.  
 6994. Was that work being carried out on the Monier principle? Yes. Dr. Manning got £1,000 from the Chief Secretary, Sir George Dibbs, for certain improvements at Callan Park. Mr. Smith found that the money for the culvert on the Parramatta Road had run out before we had completed the structure, and he told me to finance it from Dr. Manning's vote, which I did.  
 6995. How much did you take from Dr. Manning's vote? I forget now, but I know that we used it freely. Dr. Manning, I know, asked for some extra work to be done, and we found that it would take up the whole of the £1,000, we therefore had to stop using it, and we took the balance from the grant for some work at Blackwattle Bay.  
 6996. How much was taken from that grant, do you know? I could not say. I know that the whole cost of the culvert ran out from £250 to £300.  
 6997. You are sure it did not exceed that? Yes.  
 6998. After you left the Department were you sent for by the Under Secretary to come back and put Mr. Smith's accounts in order? By one of the officers of the Department, and I went and adjusted the accounts.  
 6999. Why had they to send for you? I do not know; but they did send for me.  
 7000. Were you the only one who understood the accounts? I could not say that; but I was sent for, and I adjusted them.  
 7001. So that you and no one else had perfect control over the accounts? Undoubtedly. I was paid for what I did in adjusting them afterwards.



7002. On leaving the service you received a letter of testimonial from the Department, did you not? I T. W. Bryant did not ask for any.

7003. Did you not receive a letter containing these words:—"I am to say that, in appreciation of the satisfactory manner in which you have performed your duties, he has approved of your being allowed two months' leave of absence on full pay, to take effect from the date abovenamed;"—the word "he" refers, I suppose, to the Secretary for Public Works for the time being? Yes; I received that.

3 July, 1896.

7004. And afterwards you were awarded pay for coming back to adjust Mr. Smith's accounts? Yes.

7005. How many months was this after you had left? I think it was about four months, but I have since been engaged in other business, and I have really forgotten about many things which have occurred in the service.

7006. Was it not a laughing matter in the Department—this matter of the Monier work culverts on the Parramatta Road and Callan Park collapsing? It was looked upon as a very costly experiment. I know that, speaking of the Parramatta Road culvert, the inspector said it was a botch of a job.

7007. As a matter of fact, had not that culvert to be sustained by iron plates after all? That is what I heard from one of the inspectors. I heard they had to get some iron plates to shield the work on the Parramatta Road.

7008. Who made those iron plates? That is outside of my knowledge; I did not inquire, but I understood that our own blacksmith had made them. At least that was the effect of the conversation which took place in the office.

7009. Can you tell his Honor what took place on the work at Callan Park, where the Monier principle was also used? No; not from my own observation, because my duties were in the office, but, of course, I heard conversation taking place between the men who came there for their pay. I have nothing to do with the work outside, and I do not understand it at all.

7010. In connection with the general works account is there not a sum of £15,000 put at the disposal of the Under Secretary for Public Works every year? I always understood the Commissioner for Roads could draw upon an advance of £10,000.

7011. He had an account of that nature? Yes.

7012. Is it not a fact that so far as the drawing upon that account is concerned, it can be replenished as they go along—that it can be kept at a standard of £15,000? That I could not say.

7013. Is it not a fact that there is often £30,000 or £40,000 drawn out of that account in the course of the year? I do not think so; I always understood that it was limited to £10,000.

7014. The Treasury has no control over that money at all, has it? That I do not know.

7015. How would the expenditure be accounted for to the Auditor-General;—would it be in detail or in a lump sum? The accountant would probably have to give a general statement to the Auditor-General.

7016. You do not know yourself what is done? No; Mr. Carroll always financed everything for us.

7017. He was the accountant for the Roads and Bridges Branch? Yes. I had nothing to do with him at all, except that he used to advance money for Mr. Smith's account.

7018. *Mr. Smith.*] You are not an engineer? No.

7019. So that you would not be able to express an opinion as to the character of any of the work? No.

7020. Did you ever see the work in question? No, all that I know about it is what I have heard from the conversation of men who have come into the office.

7021. Who was the inspector who said that the work had been botched? There were two inspectors who said so—an inspector on each job.

7022. Did they both say that it had collapsed? They both said that it had collapsed.

7023. What were the names of these inspectors? Bramston and Larkin.

7024. What did one of them mean when he said that the work had been botched? Two of them said so.

7025. One of them also said I believe that the work on the Parramatta Road had had to be supported by iron plates? Yes; that is what I understood him to say.

7026. As to the accounts, you say you are perfectly sure that the cost of that job was from £250 to £300? I said about that. That would include salary, wages, and everything, taking the thing purely as a business transaction.

7027. You mean taking the cost of the whole work, tools, and everything? Yes.

7028. Do you know what the nature of the work was? I understood that it was cement and concrete.

7029. But do you know the nature of the job generally? Nothing beyond that.

7030. You only know that it was the building of this particular culvert? Yes.

7031. But was there not something beside—the removal of the old structure, for instance? That I cannot say, but I believe there was; in fact it must have been so.

7032. You think the old structure had to be removed? I cannot say definitely.

7033. The total cost, including the removal of the old structure, you take to have been £250? What I mean is that the Monier culvert as it stood, that is, the building of the structure, cost £250.

7034. That is as far as you know from the accounts which passed through you? Yes.

7035. If you had the opportunity you could pick out the particular papers containing the cost? Yes.

7036. *Mr. Parkes.*] Where was it that Mr. Hickson gave instructions that the cement was to be bought from? I do not know about any instructions, but the cement was bought with his approval from Carter, Gummow, & Co. for the two works.

7037. Are there vouchers for all the payments that were made? I think so.

7038. They could be found? I think so.

George McCredie recalled and further examined:—

7039. *Mr. Parkes.*] Have you worked out an estimate of what the original departmental plan of Contract No. 77 would cost if the structure were made of exactly the same material as is employed in Contract No. 101? Yes.

G. M. Credie.

3 July, 1896.

7040. What did you find the difference to be? I have made an estimate of the probable cost of the two aqueducts in Contract No. 77, and I find that if similar materials were used in those aqueducts to those in Contract No. 101, they would cost £1,234 less than if carried out in accordance with the departmental design. [*Vide Appendix No. 15.*]

7041.

- G. M'Creddie. 7041-2. Have you also made an estimate as to the saving between the departmental plan of 77 and 101, if the work were carried out according to the departmental schedules? Yes; there is an amount of £1,208 Os. 3d. in favour of the material in No. 101—that is, if No. 77 were built with the material used in that contract.
7043. That places it beyond all doubt that the design in No. 77 is more costly by a long way than is the design in the case of No. 101? Yes; as designed by the Department.
7044. The material you have taken out is only for the structure above the springing of the arch? Yes; the spandrels—all the material that would take the place of the brickwork.
7045. You undertook to provide His Honor with a plan of the work you are doing in the telephone subway, and also to furnish particulars as to the cost of that work per foot run? Yes.
7046. You produce now a drawing of the tunnel? Yes; acting upon your instructions, I have made a drawing of the section of the telephone tunnels for the Electric Telegraph Department at a scale of 2 inches to the foot, and have gone into the cost of their construction, which amounts to £2 3s. 10d. per foot run. [*Vide Appendix H.*]
7047. *His Honor.*] Does that include excavation and all? Yes; pipes, subducts, and all.
7048. The drawing you have handed in shows the subduct? Yes; a 9-inch subduct, with 4-inch pipes running into it.
7049. At what intervals do those pipes run in? It depends upon the nature of the ground. Some would be 10 feet apart and some 20 feet apart. Outside of the brickwork the drawing shows hand-packed ballast.
7050. *Mr. Parkes.*] That forms a weeping drain, does it not? Yes.
7051. *His Honor.*] There is, therefore, a continuous weeping drain at the back of the lining? Yes; you could walk through the tunnel without getting wet at all.
7052. *Mr. Parkes.*] As regards the compo., you have made a practical test by taking the exact material used in these Monier arches? Yes.
7053. Will you give His Honor the particulars as to shrinkage and other matters? Yes; I made a test to find out the shrinkage of compo. mixed in the proportion of three of sand to one of cement, and I find that it amounts to 5 cubic feet in a cubic yard of dry materials. This is from an actual test. I had the materials mixed up dry. After mixing the cement with the sand which is being used upon the aqueducts—and it is a very fine sand—I had them turned over half a dozen times dry. They were thoroughly mixed and set. I have given you the result.
7054. You have gone further into the matter with a view to test the actual value of the material? Yes.
7055. Will you give the figures? Yes; I have taken the actual value of the compo. from this test. I have allowed six and three quarter casks of cement to a cubic yard, because it is specified in some of the specifications, and the result is as follows:—Six and three-quarter casks of cement to 1 cubic yard, at 9s. 6d., £3 4s. 1½d.; 3 cubic yards of sand at 2s. 6d., 7s. 6d.; giving £3 11s. 7½d. as the cost of 3 cubic yards, 7 cubic feet, of compo, making the cost of material, per cubic yard, £1 2s.; timbering, 2s.; labour, 3s. 6d.; profit, 2s. 6d. The total cost per cubic yard placed in position comes out at £1 10s. Should the 62 tons of ironwork in the aqueducts be included in the cost of the compo. it will increase the price per yard by 12s. 6d., making the total cost, including ironwork, £2 2s. 6d. per cubic yard. [*Vide Appendix No. 15.*]
7056. *Mr. Davis.*] In comparing the cost of a subway with the cost of a sewer, I suppose it would be fair to take into consideration the relative cost of material? Yes.
7057. Supposing the bricks in the sewer were of better quality, and therefore more costly bricks than those used in the subway, that would have to be borne in mind? Yes; the bricks in the sewer would be double-pressed as against wire-cut bricks in the case of the subway.
7058. As a matter of fact, the bricks in the sewer would be of better quality than the bricks in the subway? In which sewer?
7059. The sewer you examined the other day? Yes. Of course, double-pressed bricks are a different brick altogether.
7060. In making your experiment with the compo., you said you used a compo. of 3 to 1;—did you ram it? Thoroughly.
7061. You say the experiment was made dry? I mixed the stuff dry, and then mixed it with water. It was put into the box and battered down until the water came out at the top.
7062. There was enough water in the compo. to make it quite soft? Yes; it was like so much mud.
7063. Have you ever tried the experiment with less water to see what difference that would make to the shrinkage;—have you, in fact, seen any of the compo. mixed on the works at Contract No. 77? No.
7064. So that you are not sure that the compo. you mix is of the same consistency as the compo. which is being used upon Contract No. 77? That is an easy matter to settle. As far as I could judge from the consistency of the material, I think it is very like the consistency I obtained. I examined the material very carefully and I mixed the stuff with which I made the test accordingly. I got the material, as nearly as it was possible to make it, similar to that in the aqueducts. I went over to see the material there and carefully examined it before I mixed the stuff for my test.
7065. You have put down 2s. 6d. per cubic yard for sand? Yes.
7066. Do you know whether that is the cost of the sand which is being used on Contract No. 77? No; I took the sand which the contractors are using on No. 77 to be worth about 1s. 6d. per yard, and I allowed the extra shilling.
7067. Supposing, for the sake of argument, that the sand there cost three times the amount you have estimated, that would rather interfere with your estimate of the cost, would it not? If the sand cost three times the amount I have given it would alter my estimate, of course.
7068. You have allowed 2s. per cubic yard for the timbering required for centering, staging, &c.? Yes.
7069. Do you think that estimate would cover the cost? Yes.
7070. Have you measured up the centerings? Yes.
7071. Have you measured up the scaffolding? I took it at 2s. per yard, but in most cases it is taken with the concrete.
7072. You think the cost amounts to no more than 2s. per yard? No.
7073. How do you arrive at 3s. 6d. per cubic yard for labour;—did you make that estimate from your observation of the work? Yes; having regard to the class of work I allowed a little more than I would under ordinary circumstances.
7074. But is your estimate formed from observation of what is being done upon Contract No. 77? Yes.
7075. Have you carried out any Monier work? Not in aqueducts. 7076.

7076. Have you carried out any Monier work similar to that done upon Contract No. 77? Not in aqueducts. I have carried out Monier work—that is, iron put in cement or compo. just in the same way as is being done in this case, although I have not applied it to aqueducts. G. M'Creddie.  
3 July, 1896.
7077. Therefore, your 3s. 6d. per cubic yard for labour is a mere estimate? Yes.
7078. *Mr. Gummow.*] As to the price of the sand, could you tell me where we could get it at 2s. 6d. per yard? I do not think the sand you are using is worth more than 1s. 6d. per yard. I think I am allowing you a shilling more than its actual value.
7079. Where do you think we get the sand we are using? I should imagine that the stone was not taken far from the site where it is being broken up. It looks like ordinary soft sandstone.
7080. Do you know what it costs us to crush? No, I do not, but I know what it is worth.
7081. Do you know where we get the sand from? No.
7082. Have you any idea where we get it from? I have an idea.
7083. Where do you suppose it is obtained from? I fancy most of it is taken out of the excavations. The stone from the excavations is broken up, and the sand is used in the compo.
7084. If that were not so where could we get the sand at the price you have given? We have purchased similiar sand—the same sort of fine sand—for 2s. 6d. delivered.
7085. Where could you get it? We get it from the sandhills.
7086. Would it be equal to the sand we have out there? It would be better, because it would have more grit in it—your sand out there is very floury. I was surprised to see you using such fine sand on the contract.
7087. Do you think the Bourke-street sand would be as good as the sand we are using? I have not tested it.
7088. If the Department would not let us use the sandhill sand, but made us use a sand which came up to the Nepean sand, what would be your impression as to the cost of it? If the Department made you use sand superior to Nepean sand it would be more expensive, of course.
7089. If they made us use sand equal to Nepean sand, would it cost more than 2s. 6d. per yard—if it were equal in strength, judging from the tests, to the Nepean sand, would it be more costly? I would say this, if the sand were similar to the Nepean sand it should be a more expensive sand.
7090. *His Honor.*] You must have had a good deal of experience as regards sand? Yes.
7091. Did you see from the newspaper reports the opinion which Mr. John Young expressed about the Sydney sand? Yes.
7092. I mean as to the presence of clay? Yes.
7093. What have you as an expert to say as to that? I have not gone into that matter, but we prefer for really first-class work, with adhesive power, Nepean sand. It is more expensive. We give 6s. 6d. a yard against the cheaper rate of the sandhill stuff. The sand from the sandhills is good enough for ordinary building purposes.
7094. But the other is sharper sand? Yes; it seems to hold the cement better.
7095. Is it because of the extra sharpness that you consider it better, or is it because of the absence of clay? The absence of clay, I have no doubt, is an improvement. If you take a small bottle of Nepean sand you will see diamond-shaped pieces running all through it.
7096. Have you had any experience of the continued shrinking of compo. or concrete—I mean a shrinkage after it has set? Yes; I have had some experience of shrinkage after setting, and that is the greatest danger I can see in connection with the Monier system. We must have time in which to see whether it will stand. It is a matter for experience as to whether the Monier system will stand in aqueducts.
7097. On the question whether the shrinkage is due to the presence of clay in the sand, you do not profess to express an opinion? No.
7098. Take the ordinary cement used in the facing of buildings, what would be the proportion of sand to cement in good buildings? Two to one for a first-class job. We often put it on in two-coat work.
7099. Ought it, or ought it not, when properly put on, to show any hair-cracks—that is, fine cracks running through it in all directions? It does show hair-cracks, even when it is well put on. We have such a peculiar climate, excessive heat following excessive cold, and that seems to affect the cement. Even in ordinary concrete work, if you go a distance of (say) 7 or 8 feet, you will find a crack in it.
7100. Is it not a common experience that cement facing on walls, unless it be painted, will not keep out water? It is folly to think that cement will keep water out of walls. They must be painted.
7101. How is compo. going to keep water in, when cement upon walls will not keep water out? I could tell you after we have had a little experience.
7102. *Mr. Parkes.*] Is it not the fact that the profession in the city, apart from the Government Department, will not dream of using crushed sandstone as sand;—do you know any one firm of architects or engineers who use it? I never saw it in any specification but the Government specification, and I have never heard of any firm of architects or engineers using it.
7103. Do not the whole profession in the city take the greatest care in getting a good sharp grit in their sand;—do they not take care to see that it is free of any sort of fine particles—that is the first thing they think of, is it not? Yes.
7104. The reason being that any earthy matter or any fine matter in the sand causes an unequal distribution of the cement—is that not so? Yes.
7105. It gets patchy? Yes.
7106. And, therefore, there is an unequal shrinkage when it is set? Yes.
7107. *Mr. Davis.*] Do you know whether the sand specified in the case of Contract No. 77 is crushed sandstone? I could not tell you, but I know the contractors are using crushed sandstone.
7108. You say that you have seen it specified nowhere else except in Government contracts? Yes.
7109. Where have you seen it specified in Government contracts? In the schedule of specifications.
7110. What contracts are you referring to? I could not say unless I looked them up. I know that I saw crushed sandstone provided for or specified in one of the schedules.
7111. What is specified in contract No. 77 with regard to sand? It is to be sharp coarse sand, free from all earth; but that is not the sand that is being used—there is no doubt about that.
7112. The sand specified is sand equal to the Nepean River sand? Yes.
7113. Are you in a position to say that the sand which is being used is not up to that standard? Yes.
7114. That is your opinion? Yes. I say the sand I saw them mixing in the concrete was not up to that standard.
- 7115.

- G. M'Creddie. 7115. Supposing tests had been repeatedly made both of compression and tension from the sand that you say you saw being used upon Contract No. 77, and that that sand stood better tests than the Nepean River sand, what would you say? I should like to see the test made.
- 3 July, 1896. 7116. But supposing tests were made with that result, would you not say that it was conclusive proof? Supposing they did show that result.
7117. As to the clayey matter in the sand, do you not think that ordinary compression and tension tests would indicate the presence of a weakening material of that description? If the sand were tested properly it should.
7118. Coming now to cement facings, you said that if a 2 to 1 compo. were put on the outside of a house it would not keep out the dampness? Yes, I am perfectly satisfied of that.
7119. Have you had any experience of a 1 to 1 compo.? On the outside of buildings, no.
7120. Supposing it were specified in the case of this particular aqueduct that a 1 to 1 rendering should be put both inside and outside, what would you say as to the probable effect which that would have in keeping the sewage from penetrating the structure? I should want to test it. My own opinion is that cement is of too porous a nature to hold water—that it will let water go through it. I have had so much trouble with it in buildings. I have seen work of that kind done with the utmost care from time to time, and it has been found afterwards that it would not keep water out.
7121. Have you tested the porosity of neat cement? No.
7122. Have you tested the porosity of 1 to 1 compo.? No.
7123. So that, in fact, you are not in a position to say that it would be porous? I am in a position to say that a 2 to 1 compo. would be porous, and as to a 1 to 1 compo., I will test it and let you know.
7124. *His Honor.*] Do you know whether, after the final re-building of the aqueduct near the big reservoir at Prospect, it held water perfectly or not? You will find even now that the aqueduct leaks here and there. Of course, before it gave way last time there was a big leakage.
7125. That was bad work, I suppose? Yes.
7126. I suppose the work is all brick, cement, and compo., is it not? Yes; brick piers and cement. I do not know whether they put a pipe in last time or not.
7127. You do not know whether there is now a pipe or a simple carrier? No.
7128. You saw the work when it was first built? Yes. At that time it was something like the Jenolan Caves. There were stalactites hanging down in all directions.
7129. *Mr. Gummow.*] What do you mean by a 5-foot shrinkage in a yard;—do you mean that 32 shrink to 27 feet? Five feet go away in 27. In my former estimate I made the cement disappear altogether, but that is not the case.
7130. If you put in 32 feet does it shrink to 27, or do the 27 shrink to 22? My answer is that 27 feet shrink to 22.
7131. As to the testing of sand, have you had any blocks of sand and cement, mixed together, tested for compression? Yes.
7132. Have you noticed how they crush? Not differently from anything else crushing up.
7133. Do they crush irregularly or on some particular curve;—do they flatten out or do they split up into a certain shape? The one that I saw bulged out. It was what you might call squashed.
7134. Why I asked the question is this, Mr. Parkes, speaking about crushed sandstone, estimated that, on account of the foreign matter which was in it, you would not get such a sound compo. as from the use of the Nepean sand;—supposing there were a percentage of foreign matter in it, would it not be shown in the crushing whether the block which was being tested was a homogeneous mass or not? One ought to stand a great deal more than the other.
7135. But in the crushing are there any particular lines that they should crush to? I could not tell you that.

Cecil West Darley recalled, sworn, and examined:—

- C. W. Darley. 7136. *His Honor.*] I thought you might like to make an explanation of your evidence the other day as to the question of who it was who made inquiries as to the sureties in the case of Mr. Gillan and Mr. Forrest? I was called the other day suddenly, and I did not know what I was to be examined about. I answered the questions put to me as if I had followed the usual practice of the Department—that is, in such cases to send out one of the officers to make the necessary inquiries. I quite forgot at that time who the officer was. I am still under the impression that inquiries were made by one of the usual officers, but I afterwards saw the officers who would be likely to make the inquiries, and none of them could recollect having done so. On looking up the matter, I find that the whole office was at that time in a state of chaos. Departmental changes were taking place. My chief clerk was taken away from me, and I had not him to refer to. Some temporary officer was acting in his place. Mr. Conley, the officer who used to make inquiries in such cases, does not recollect my asking him to do so. However, I would certainly say this—that I made the usual inquiries and obtained the necessary information. I was at that time working partly in this office and partly in the Water and Sewerage Board Offices. I was going backwards and forwards from one office to another. Moreover, I was not at all well at the time; in fact, the doctor had ordered me to desist from further work, so that I have not a very clear recollection of what took place. I cannot tell you now who made the inquiries, but I am certain that I got the necessary information, because I was always most particular in obtaining it. We had a regular system of carrying out that part of our duty, and it certainly would not be likely to have escaped my attention at that time, because the names submitted were then quite unknown to me. I am certain that I did not regard the matter as one of form. I must have made the usual inquiries.
- 3 July, 1896. 7137. You can fix the time when you actually left Sydney, I suppose? I see that my minute was dated April 8th last, and I left Sydney by steamer on the 13th. My impression is that I wrote the minute on Monday, and left on the following Saturday. I have already explained that my office was at the time upset. I cannot even recollect where I wrote the minute—whether I wrote it in the offices of the Water and Sewerage Board or at my office here. I thought yesterday that I might have written it at the office of the Water and Sewerage Board. I thought I might have caused inquiries to be made by the accountant of the Board, and I asked him whether he had any recollection of making them. I found that he had no recollection; but that I did make inquiries, and that I obtained information which I deemed satisfactory, I can positively assert.

7138. *Mr. Parkes.*] Do you remember whether you obtained information to the effect that the sureties were worth £6,000 each? I do not recollect the form in which the inquiries were made, but I must have been satisfied that the two sureties were financially sound. I do not think it was mentioned that they were worth £6,000 each. [*Vide Appendix No. 26.*]

C. W. Darley.  
3 July, 1896.

7139. Could you get information on the point from the manager of the bank? Perhaps I had better explain the course usually adopted in soliciting information of this kind: My accountant (I usually look to him in these matters) would go to the manager or secretary of the Bank of New South Wales, where our account is kept; he would ask whether the persons concerning whom inquiries were being made were known. If no account is kept by the persons at that particular bank, and information is obtained as to where they do bank, the manager or secretary of the Bank of New South Wales, as the case might be, would make inquiries of an officer of the other bank. In this case I do not remember hearing in what bank Mr. Gillan or Mr. Forest banked. In these cases I merely get a verbal report from the bank as to the sureties.

7140. You think this information was not obtained in this case through your accountant? I have already explained my usual practice.

7141. But it was not followed in this case? In this case I am unable to say who got the information. I do not think there could have been any falling away from the usual practice. Not knowing the names which were mentioned, I probably took extra care to get the information. My accountant tells me, however, that he cannot recollect getting it.

7142. *Mr. Smith.*] Supposing that in this case the parties banked at the Bank of New Zealand, I suppose inquiries would not be made directly at that bank? No; we should not go to the Bank of New Zealand, we should go to our own bank, and they would make the necessary inquiries.

7143. You would go first then to the Bank of New South Wales? Yes.

7144. It is all done verbally? Yes. The result of the inquiries is submitted to the Minister in my report. If I consider that the sureties are sufficient, and that they may be accepted, that is all that is ever put on paper.

William Thompson recalled and further examined:—

7145. You have made an estimate as to the cost of the original departmental scheme in Contract No. 77, if it were built with material similar to that used in Contract No. 101? Yes. I took out a 52-foot 3-inch length of aqueduct, executed first in the specified materials, and secondly, in similar materials to those used in No. 101.

W. Thompson.  
3 July, 1896.

7146. You are taking the lineal foot above the springing of the arch? Yes; the piers, brick arches, and carrier are common to both, and are not estimated. It would have been cheaper to carry out the scheme with the material used in No. 101 by 12s. 6d. per foot; at my estimate of value and at the Government schedule rate of Contract No. 77 the cost would be 10s. 6½d. per foot less. [*Vide Appendix No. 17.*]

7147. Therefore, if the method of construction, as far as material is concerned, in No. 101 had been adopted in No. 77, it would have been in the total—how much cheaper? According to my estimate of value, nearly £1,200, and if carried out according to the schedule rates, about £1,050.

7148. *His Honor.*] Did you take into consideration the fact that there was more pier work in the one case than in the other? I have not taken the piers into consideration. The difference comes in in this, that the brick spandril of No. 77 is much more expensive than the spandril in the other case. The stone dressings in No. 77 also add greatly to the cost.

7149. You do not consider the piers in either case? No; because they are common to both.

Christian Herman Ohlfsen-Bagge re-called and further examined:—

7150. *Mr. Parkes.*] You have further examined the Monier arches which are being built at Johnstone's Creek and White's Creek? Yes.

7151. Will you give his Honor your opinion of the work as a Monier construction? Yes; I have drawn up a report, which I will read:—

C. H. Ohlfsen-Bagge.  
3 July, 1896.

1. Commencing at the east end (Johnstone's Creek), I find a transverse joint across the aqueduct, over centre of pier, at end of the sixth small arch.

2. There is a small longitudinal crack over the first arch, along underside of aqueduct.

3. Iron rods exposed (rusted) along underside of aqueduct, in places, and, although that they will be covered by cement rendering, this should not be.

4. Three more small arches, but the aqueduct network standing exposed over the third arch, coated with cement grout.

5. Aqueduct is built with fine bluestone concrete, whereas compo. should here be used for Monier work. The concrete was stepped back over the ninth arch from the east end of aqueduct. This may cause leakage hereafter.

6. Every third pier under the small arches is double the thickness as the intermediate piers; 12 inches and 24 inches in thickness when rendered, I expect.

7. Six more openings not yet arched over.

8. Three large arches completed, with spandril arches above, up to underside of aqueduct; the fourth arch and spandrils also completed up to same level, but the centering still standing.

9. Part of the centering for the fifth arch has been erected; these are all the centerings which I saw. The piers for the sixth and seventh arches are built.

#### White's Creek Aqueduct.

1. Seventeen arches are completed up to the underside of aqueduct, and all the large arches and spandrils are completed up to the same level.

2. The concrete boxes, over first and second large arches, were nearly erected and the wrought-iron netting for some length placed in position.

3. Over the third large arch the concrete boxes not yet erected. The concrete boxes are rigid, but did not seem to be watertight.

4. Over the fourth, fifth, sixth, seventh, and eighth large arches the aqueduct has been built.

5. There is a transverse butt-joint across aqueduct over centre of piers of large arches.

#### Notes.

The work seemed to be at a standstill on the day I examined it, and the stoppage of such a structure will undoubtedly be very injurious to these works.

The disconnected mode of carrying this work out seems to be quite contrary to the mode indicated (as necessary for the Monier system) in the reports on Monier work which have come under my notice.

C. H.  
Ohlfsen-  
Bagge.

3 July, 1896.

The cements used for Monier work at home are, as far as my experience goes, not to be had in the colonies. The home cements used for Monier works are guaranteed by the State—the most perfect cements—and the home patentees' calculations are based on those cements. If such cements are not used here, Monier works are bound to be quite fallacious; it would only be a matter of time.

Allowing even that the contractors have carried the works on with the very best materials obtainable here, they cannot compare with the materials used for such work at home.

7152. You have made some notes also with reference to the Monier patent generally? I have put some notes together to show why I object to adopt the Monier system in preference to the usual system of carrying out works of this character in brick and mortar. They are as follows:—

1. This patent was taken out by Mr. Baltzer without my knowledge simply upon the advertising pamphlet of the Monier patentees received by Baltzer from his brother.

2. Had I known of this, I would have opposed the granting of this patent, as the office knew of the Monier system some years prior to Mr. Baltzer receiving the pamphlet.

3. The patentees at home are specialists, have a special staff of specially-trained workmen of many years experience in constructing models on the Monier system before they undertook the construction of works on this system.

4. The patentees here based their patent solely upon the information contained in these advertising pamphlets, which did not contain the key of the patent.

5. I did not consider the local patentees personally as specialists, although, no doubt, they employed the best tradesmen they had on this work.

6. Mr. Baltzer was not a specialist, had extremely little, if any, practical experience of work, having, so to say, just left the University in Germany; in fact, what he knew of engineering he learnt from me in the sewerage office.

7. The patentees should have a thorough knowledge of sand, cement, and iron; the most accurate knowledge of mixing the exact quantities of sand, cement, and water, together; of using the very best of cement, of exactly the same strength throughout; of using the very best standard sand of the same gauge throughout; and of putting the mortar into the work in the most uniform manner within water-tight centerings and boxes, and of continuing the work comprising each structure (when once commenced) without interruption until completion.

8. The patentee in this instance must be a specialist; and knowing what a time it has taken the home patentees to become specialists, I cannot see how the local patentees could have become specialists.

9. At home the system is not adopted in public works, except in special cases, then the patentee has to carry it out, and the Government insist on the work having stood three years before they return the contract deposit and the securities.

10. If the home Governments had adopted the Monier systems for public works they must have assumed that every contractor and builder was a specialist, which they knew they were not.

11. Therefore, if the Governments adopted this system, the patentees would become the sole contractors for all the works, which, of course, the public would not permit.

12. To avoid this, it would be necessary for the Government to become the specialist, and that would require their officers to acquire the experience and knowledge necessary at home from the home specialists. I am not aware that at present there are any specialists of this kind here.

13. One experiment will certainly not produce specialists, chiefly when it must be assumed that all parties interested are experimenting.

7153. Do you recollect distinctly whether this patent was known in the office for some time before Mr. Baltzer patented it? It has been known since 1888.

7154. Had you pamphlets in the office giving drawings of it? No; but there were three members of the German Association of Civil Engineers, and they got out the papers and monthly reports.

7155. Were any of the papers read before the Royal Society? I heard that Mr. Hickson was going to read a paper there on the Monier system.

7156. Before the patent was granted? I cannot say as to that, but I think it was just before I wrote my first report about the Monier system.

7157. Will you tell His Honor what was the conversation which you had with Mr. Davis about the Monier experiment on the Parramatta Road? I wish to preface what I am about to say with this remark—that as a rule I never troubled myself about anything of the kind in my office. But one day Mr. Davis came to me and said, "You recollect Mr. Hickson saying to you that anybody could carry out that Monier work—well he is just building a culvert on the Parramatta Road on the Monier system. It is being done by one of his road officers—would you like to see it?" I said, "Yes, I should like to see it." Mr. Davis then drove me out and showed me the work. When I saw it, I did not like the manner in which the compo. was being put into the arch, and I mentioned that to Mr. Davis. Some time after this Mr. Davis came to me, and I thought he looked rather pleased. He said "You recollect that culvert on the Parramatta Road. I said that I did, and he observed, "Did you hear anything about it." I said I heard nothing about it. He said "Well, it has collapsed, a dray went over it and it all went smash." I said "That is interesting." That is all I ever heard of it.

7158. He looked pleased, you say? Yes; I can imagine why he looked pleased. He thought it would show Mr. Hickson that if this work were to be done by anyone in the Colony it could be done by only one set of men—the sewerage officers. Of course, we considered ourselves superior human beings.

7159. *Mr. Davis.*] As to this report you have read, you have been in the habit of making progress reports upon public works for a great many years? Yes.

7160. And you have not dropped out of doing so yet? No.

7161. You intend the report you have read to-day to be a progress report upon the present state of these works? It is merely a report setting forth what I have seen.

7162. Who instructed you to make it? Mr. Parkes; he sent me a note and desired me to go out and see the works.

7163. How do you draw a comparison between the materials which are being used upon Contract No. 77 and the materials that are used in similar work in Germany, for I presume that when you say "home" you mean that country? Well, I know for a fact that the cement used for such work at home is not procurable in these colonies for love or money.

7164. How long is it since you were in Germany? I was in Germany up to the end of 1848.

7165. How long is it since the Monier structure was discovered? We have known of it since 1888.

7166. So that it was discovered after you left Germany? Certainly.

7167. You have not seen any of the structures which have been built in Germany on the Monier system? No, but I have been a subscriber to the "Prussian State Builder," which is edited by the State, and which is contributed to by the best professional men sent all over the world to measure and draw any important work that is constructed anywhere. It is published at the State's expense for the benefit of the profession at home, and issued to them at a nominal cost, and I used to get it every year.

7168. You only know from reading what is being done on the Continent;—you do not know from actual observation? I know from reading, and no one else here knows more about the Monier system. I have had samples of the home cement, and I have compared them with the local cement. I have had work done not only with the cement used in Germany but with the cement used in Scotland.

7169.



C. H.  
Ohlfsen-  
Bagge.

3 July, 1896.

7169. Have you compared them with the material which is being used upon Contract No. 77? How could I do that, when the work commenced after I had left the office.
7170. You say that a three years guarantee is the period which is usually taken at home for these special works? Yes.
7171. Do you consider that that is sufficient? That is not for me to say; I am merely stating the conditions the Home Government have made in regard to these works.
7172. But do you think the three years is sufficient? I cannot tell you; but I think that if such a work would stand three years it would probably stand a considerable time.
7173. You think that any defects which are likely to develop would develop three years after the structure is finished? It is extremely difficult to say; I am not prepared to answer that question. I cannot guarantee the work; it may be all right, or it may not. Cement has been known to perish after three years.
7174. Can you from your own experience and knowledge say that cement has perished after it has been three years in a structure of this description? I know from engineering history that after 200 years cement work has been found to be soft, while in other cases it has been as hard as a stone.
7175. From your experience of works of this description have you known cement to fail after it has been in existence three years? I could not say whether it would do so or not. I have not seen Monier work carried out previously.
7176. *Mr. Gummow.* Are you a specialist as regards the Monier system? Not at all; I do not profess to be.
7177. Can you give an opinion in regard to it? My opinion is simply based upon what I have read about it.
7178. You cannot give an opinion from any knowledge of your own? I should not like to do that—I am not a specialist on the Monier system.
7179. With regard to the information you received as to this patent, did you get it first from Germany? Some of it; some of it I obtained in the office.
7180. In what language was the information conveyed? In German.
7181. Was any of it in English? No; I have seen nothing about it in English, except one very short paragraph.
7182. From what you saw in that case do you consider that we should carry out the work? No.
7183. What do you say is the material used in the Monier system—what is the material making the compo. or concrete? The cement is the best cement obtainable on the Continent, tested and guaranteed by the Imperial Government.
7184. What are the other materials which go to make up compo.? Sand and water.
7185. You said that the grains of the sand had to be uniform? Yes.
7186. Do you know if in the Monier system any material larger than sand is used? I have never heard of anything but sand being used in the Monier system, chiefly in water-carriers.
7187. If anything else is used it would be beyond your knowledge? Yes.
7188. When did you make the notes you read to-day about the aqueduct? Since I examined it on the 30th ultimo.
7189. You did not make your notes about Mr. Baltzer at the time when you and he were in the office together? No, I wrote these notes recently.
7190. Do you know the key to the Monier system? No.
7191. You spoke the other day about the continuity required in the construction of this work, and the same point came up to-day;—do you know whether the Monier system is used in the floors of warehouses? Yes.
7192. How do they obtain continuity in that case? From what I am told plates are sold, and these are fitted together just as timber would be fitted.
7193. But do they make the floors of the system by actually building them in position? I do not know. From what I have read I think they make plates, and that these are sold and put into position.
7194. Your information on the question appears to be very limited? I am only telling you what I have read about it.
7195. You say you do not consider the boxing upon Contract No. 77 water-tight? No.
7196. Were they doing any work the time you were there? No; I have not seen any work done there.
7197. You did not see them putting any stuff into the boxing, and then make the discovery that it was not water-tight? No, there was no one upon the works when I was there.
7198. Do you know of any failures at home in the use of this system? I know from my reading that when this work was started they thought that anyone could do it. It was tried by the Government and by private persons, and they failed signally.
7199. But during the last two years have you heard of any failures in connection with the Monier system? No, because it is only carried out by the patentees, and I have not read of any failure on their part.
7200. Who was at the Strathfield Monier arch when you went there with Mr. Davis? No one else.
7201. As to Mr. Davis informing you about the arch breaking, you say that he seemed pleased? I think, naturally.
7202. Do you know whether he thought that what he was telling you would give you any pleasure? I was amused at it.
7203. It pleased you? I got the idea that his pleasure emanated from the belief that a superior class of men were to be found in our office.
7204. And he thought the failure would give you pleasure too? Yes.
7205. As to concrete arches, did you ever object to their being used in connection with Contract 112? I knew that concrete arches were a novelty; I have myself seen on our own works failures in concrete arches, either from the want of water-tight centring, or perhaps from rubbish having been put in.
7206. Piano cases? I do not say that. I do not wish to say anything to hurt anybody, but I remember that in the case of our own works Mr. Davis showed me certain concrete work, I believe on the Darling Point sewer where it goes over the flat, which was defective. He drove me out there, and I remember his saying, "You ought to see that work in those concrete arches." When we got out there we found several concrete arches—I forget how many now—very much injured and cracked. They had to be taken down again. I remember my putting my knife in, and finding, instead of cement, nothing but sand. Mr. Davis was very much shocked about it, because he thought he had put one of the most reliable inspectors there to supervise the work. We found, also, some brick lining there which contained nothing but dry sand in the joints. I make these remarks to illustrate the danger of using concrete work at all unless it is done honestly.



- C. H. Ohlfsen-Bagge.  
3 July, 1896.
7207. But supposing it is done honestly? Then it may be all right.  
7208. You never raised any objection to these concrete arches being built? Not at all. We did a lot of concrete work, but we found also a lot of cracks in the work, owing to defective materials, workmanship, or supervision.  
7209. You were in the Department a number of years? Fifteen years.  
7210. You have been an engineer over fifty years? Yes, and as a commencement I served my time as a mason when I was 15½ years old.  
7211. You are always satisfied to carry out your works upon the old English system? I prefer the old English system to any new system I do not understand.  
7212. You prefer to rely upon your previous experience to rushing into any modern system? Rushing into any system which I do not understand, and concerning which I have not sufficient information.  
7213. It is of no benefit to you to introduce any new system? Not the slightest.  
7214. And its introduction might involve some risk to your professional reputation? Exactly. I do not like to see a thing fall down.  
7215. It might injure your professional reputation if anything happened to a new design? Most decidedly. I built the Ballarat reservoir, 80 feet high, without a blemish or settlement—as tight as a water-bottle; but I built it upon old principles, such as I knew to be in vogue in Holland and in the north of Germany. If you construct a work upon those principles it will be watertight, but it may not be, and has been proved to be in many cases not watertight, if you follow some of the modern systems.  
7216. It suited you better to adhere to the old system rather than run a risk by introducing a new system? Not necessarily. If I could be convinced that a new system were right, and if I could calculate it properly and specify it properly, and have it carried out properly, I would be prepared to give it a trial.  
7217. In other words, if you knew anything about it? Yes; we do not know sufficient as yet.  
7218. *Mr. Davis.*] Do you remember any flat across which the Darling Point sewer runs? I may have been mistaken in the sewer. It is now more than sixteen months since I have seen the different designs. At any rate, the sewer referred to is not very far from the Darling Point sewer.  
7219. Your memory may have been a little at fault? Yes; but you know exactly where those arches are.  
7220. It is possible that your memory may have been at fault in other respects? You know very well that it is not. You know that you showed me those broken-down concrete arches, and you know that you were very much astonished to see them.

John Carter recalled and further examined:—

- J. Carter.  
3 July, 1896.
7221. *Mr. Parkes.*] Is not the Lodge property at the North Shore in your wife's name? It is in my name, in Mr. Snodgrass's, and Mr. Forrest's.  
7222. Have you any property at all in your wife's name? No.  
7223. I see the deeds were lodged in the Bank of New Zealand in 1891, in which J. Carter appears to have been the administrator of E. Carter? That is my own private property under my father's will, I think—that is, if it refers to me at all, but I doubt whether it does so.

Harold Francis Norrie recalled and further examined:—

- H. F. Norrie.  
3 July, 1896.
7224. *His Honor.*] You hand in a list of sewerage contracts in which sureties were taken? Yes. [*Vide Appendix No. 27.*]  
7225. Is that a correct list of all water and sewerage contracts in which sureties were taken in lieu of cash deposits? Yes, during the period asked for. Of course, Carter, Gummow, & Co.'s sureties in connection with Contract No. 77 are also enumerated.  
7226. *Mr. Parkes.*] In no case were any of these sureties connected in any business with the contractors? Not to my knowledge. You will see that in some cases the occupation given of a surety is as that of a contractor.  
7227. But the sureties were not in any way connected with the contracting firms? Not so far as I am aware.

MONDAY, 6 JULY, 1896.

Richard Butler Rigg, sworn, and examined:—

- R. B. Rigg.  
6 July, 1896.
7228. *Mr. Parkes.*] What is your present position? I am assistant manager of the Bank of New Zealand.  
7229. What were you in the Bank of New Zealand in the year 1895? Assistant manager.  
7230. In April and May of that year? Yes.  
7231. Prior to the month of July in that year were any inquiries made of you as to the position of Mr. Gillan and Mr. Forrest as sureties in connection with any Government contract? Not that I know of.  
7232. No inquiries were made of you? None.  
7233. Not through the Bank of New South Wales? Not to my recollection.  
7234. Do you remember any being made by any officer of a Government department? As far as I can recollect none were made by anyone.  
7235. Therefore you did not report to the effect that Mr. Gillan and Mr. Forrest were reliable sureties for the sum of £12,000? As far as I can remember—no.  
7236. Would any other officer of the bank be likely to make such a report? Only the manager.  
7237. And did the manager make such a report? That I do not know.  
7238. Do you know the positions of Mr. Forrest and Mr. Gillan? Pretty well, I think.  
7239. Would you recommend them as sureties for the sum of £12,000? I think they could find that sum pretty well between them if they were sold up.  
7240. Suppose you were referred to now, would you recommend them as sureties for that amount? I never recommend anyone for any amount; I simply state the position of the persons. Mr. Gillan and Mr. Forrest are men who, as far as I know, are worth from £4,000 to £5,000 each.  
7241. What you mean is that they would be worth that amount if they were sold up? Yes. They might be worth more.  
7242. What amount has Mr. Forrest to his credit in the bank at the present moment? He may have a few pounds. I think he has temporarily an account with us, but he does not bank with us as a rule.  
7243. Mr. Gillan banks with you? Yes.  
7244. What is the state of his account? I cannot say at this moment. You have been furnished with a statement, and that should show you. [*Vide Appendix No. 30.*]

7245.

7245. That statement is correct, is it? Yes.
7246. Have you lately informed Mr. Hickson that he can rely upon these men as sureties? No. I never informed him about them at all.
7247. Has he spoken to you about them lately? He asked me the other day if any inquiries had been made of me, and I said that there had not been any.
7248. On what date was this? Two or three days ago.
7249. Did he then ask you about the position of these gentlemen? Not directly. He asked me if I had reported to the department concerning them, and I said I had not. I do not remember at this moment whether he asked me about them directly; but I think I told him I considered them men who were worth about £5,000 each.
7250. Would you tell his Honor the position of Mr. Gillan's and Mr. Forrest's accounts in the year 1895? Mr. Gillan had a balance of £52 18s. 6d., and Mr. Forrest a balance of £353 10s.
7251. Over and above that amount of money in their banking accounts, had they other moneys with you? Not in 1895.
7252. At the present time Mr. Forrest has a debit balance in his account, has he not? I think last week he was overdrawn to the extent of about £5—speaking from memory.
7253. Do you know the accountant of the Public Works Department? No.
7254. You have never seen him? Not that I know of.
7255. He has never made any reference to you as to these sureties? No.
7256. *Mr. Gummow.*] Do you know Mr. Forrest's and Mr. Gillan's positions apart from their banking accounts? As to Mr. Forrest, I have always understood since I came to Sydney in 1891 that he had a third share in the firm of Carter & Co. At that time the firm was known as Carter, Snodgrass, and Forrest. That is how I made him out to be a man worth £4,000 or £5,000. As to Mr. Gillan, I understood that he had a full fourth share in the old firm of Gummow, Gillan, & Co. I supposed that their capital would be worth more than £10,000. Mr. Gillan has had over £1,000 on fixed deposit at various times. I therefore regarded him as a saving man quite outside of his having an interest in the firm. That is really all I know about them.
7257. Do you know if Mr. Forrest has a private banking account elsewhere? I think he has. I always understood that it was so; I know that we are not his bankers.
7258. Do you know if Mr. Gillan has an account anywhere else? I do not know.
7259. Do you know if he has an account in Adelaide? I have not heard. I know that he is in Adelaide.
7260. *His Honor.*] I suppose that as bankers you get a pretty good idea of the general financial credit of clients and other persons? Yes, concerning anyone doing business with us in any way at all, we are able to form a pretty good idea.
7261. What in 1895 was the state of the general financial credit of Mr. Gillan? We looked upon him as a man worth £4,000 or £5,000, being in the position in which we supposed him to be as a member of the firm of Carter, Gummow, & Co.
7262. But outside of that, and taking his repute for honesty and that sort of thing, how does he stand? I always looked upon him as what we should call a responsible and substantial man.
7263. And what have you to say concerning Mr. Forrest in the same relation? I happen to have known him for nearly twenty years. I think very highly of him. I knew him when he was a contractor in Dunedin.
7264. And how has his reputation stood? It has always been good as far as I know. I never heard of anything against him. I was going to add that I have not seen so much of Mr. Forrest here, but that I have had a good deal to do with him in New Zealand, when he was a member of the firm of M'Gill & Forrest.
7265. What in your experience as a banker does it indicate when a man is in the habit of becoming a fixed depositor? He is generally a thrifty man. I should say, too, that he was somewhat conservative.
7266. He would be very slow to make wild-cat investments? Yes. I should say that as a rule the man who had a fixed deposit would be a conservative man.
7267. *Mr. Gummow.*] You have had dealings for a good while with members of the firm of Carter, Gummow, & Co.? Yes, ever since I have been in Sydney, for a period of five years.
7268. Will you express an opinion as to how you regard them, speaking in the light of the business transactions you have had with them? I should feel inclined to give them anything they asked for. If they had come to me and had wanted £5,000 I would give them it without security, and I do not know of a better test than that.
7269. You have no reason to doubt the integrity or honour of Mr. Gillan or Mr. Forrest? Not at all. Of course as you are aware they do not arrange the finances of the firm.
7270. Do you not consider them at all? Yes. I have no reason whatever to doubt them. Of course the financial arrangements of the firm are made always by yourself and Mr. Carter.
7271. You have no reason to doubt the members of the firm in any way? Not any.

R. B. Rigg.  
6 July, 1896.

George Alexander Wilson, sworn and examined:—

7272. *Mr. Parkes.*] You were lately manager of the Bank of New Zealand in Sydney? Yes.
7273. Were you manager in May and June, 1895? Yes.
7274. Were any inquiries ever made of you by any officer of the Public Works Department with reference to Mr. Forrest and Mr. Gillan, as sureties in connection with the contracting firm of Carter, Gummow, & Co.? I do not recollect any such inquiries. Had they been made by any officer of the Public Works Department, of course they would not have been answered.
7275. Whose inquiries would you have answered then? I might have answered inquiries by a bank.
7276. Were such inquiries made by any bank manager? Not to my recollection; but it is quite possible that they have been made. Hundreds of such inquiries were made of us. There would be no record of them unless we were written to; if that were done there might be an answer in writing.
7277. But the inquiries would not be always made in writing? No.
7278. You say that, as regards these two sureties, you do not recollect any such inquiry? No; I recollect various inquiries about the firm, but not about the individual members.

G. A. Wilson.  
6 July, 1896.

7279.

- G. A. Wilson. 7279. The names of Mr Forrest or Mr. Gillan were never specifically mentioned? I do not remember that being done.
- 6 July, 1896. 7280. Had you lately any conversation with Mr. Hickson concerning Mr. Forrest or Mr. Gillan? I had a conversation with Mr. Hickson about the firm, I think, and the names of Mr. Forrest and Mr. Gillan may possibly have been mentioned.
7281. As members of the firm? Yes.
7282. On what date was that? I suppose it would be about six weeks or two months ago. The matter was mentioned incidentally in conversation.
7283. What did you then report? I reported that Mr. Gillan was a man of some means.
7284. What property has he in New South Wales? That I do not know; but I know that he has means.
7285. How do you arrive at that conclusion. Had Mr. Gillan a very extensive business with your bank? Not very extensive; but it showed that he was a member of a firm who were carrying on large contracts, and moreover that he could afford to have money idle.
7286. In what concerns was he interested? He was a member of the firm of Carter, Gummow, & Co.
7287. Was he a full share partner? I do not know anything about that. I never had any business with him connected with the firm. Mr. Carter always transacted the business of the firm with me.
7288. Do you know the state of Mr. Gillan's account in the months of May or June, 1895? I could not say now what it was; but I know that he was a man of means.
7289. Do you know what amount of money he had in the Bank of New Zealand at the time you left? I could not say now what the amount was.
7290. When did you sever your connection with the bank? In January of this year.
7291. And you cannot recollect what was the state of Mr. Gillan's account then? No.
7292. *Mr. Smith.*] I suppose it is a usual thing for banks to inquire of one another as to the financial standing of individuals? Yes; it is done daily.
7293. As a rule it is done verbally? Yes; some banks will not give the information in writing.
7294. You do not keep a record of these inquiries? No.
7295. Suppose the Bank of New South Wales had made inquiry of you as Manager of the Bank of New Zealand, in March or April, 1895, as to the financial standing of Mr. Forrest, what would you have said? I could not have said much about Mr. Forrest, because I do not know as much about him as I do about Mr. Gillan.
7296. What would you have said supposing inquiry had been made of you concerning Mr. Gillan? I should have said that he was a thoroughly sound man financially.
7297. *Mr. Gummow.*] Do you know whether Mr. Gillan has an account with any other bank? I could not say.
7298. Could you tell me whether he has used his account in Sydney as an ordinary daily working account? I think not. I believe I was told that he had an account in one of the other banks—I think in the Australian Joint Stock Bank.
7299. You know that he is in Adelaide? I knew that he was in Adelaide. I do not know if he is there now.
7300. You do not know whether he has a banking account there or not? No.
7301. As to the firm of Carter, Gummow, & Co.—what was your opinion of them while you were Manager of the Bank of New Zealand, and while they were doing business with you? I had the highest opinion of them from a banking point of view.
7302. Do you consider them financially sound? Yes.
7303. Were they business-like in their transactions as far as you were concerned? Very.
7304. Did they carry out their promises—was their word their bond? Always.
7305. You had no reason to doubt them in any way? No.

Harold Francis Norrie, recalled, and further examined:—

- H. F. Norrie, 7306. *Mr. Parkes.*] On 26th September, 1895, you wrote a letter in which you say,—
- 6 July, 1896. The contractors executed such a bond on 16th May last, and on the same date Messrs. James Gillan, of Dulwich Hill, householder, and George Forrest, of Marrickville, householder, entered into similar bonds in the sums already named. The sureties furnished the usual statutory declarations that they were respectively worth £6,000 over and above all their just debts and liabilities of every kind.
- Did you write that letter at the instigation of the Minister? No, as nearly as I can recollect the Under Secretary of the department asked me what had been done in the matter and I thereupon wrote that minute.
7307. It was directed to Mr. Barling, was it? It was directed, I think, to the Under Secretary.
7308. Was it for the use of the Minister? I do not recollect that I was told that.
7309. On what grounds did you make the statement that the sureties were respectively worth £6,000 over and above all their just debts and liabilities of every kind? I did not make that statement.
- 7309½. I presume you made inquiry before you executed this document? No. Inquiry had been made by other persons, I presume.
7310. *His Honor.*] You made no independent inquiry? No.
7311. *Mr. Parkes.*] From whom did you take your information? I took the declarations themselves.
7312. Had you noticed the nature of the declarations. For instance, look at the declaration of Mr. Forrest on page 121 of the parliamentary papers. He says:—
- I, George Forrest, of Marrickville, in the Colony of New South Wales, householder, do hereby solemnly declare and affirm that I am possessed of property to the value of £6,000 sterling and more, and that such property consists of—Freehold property, £5,700; cash in bank, £300 sterling. And I make this solemn declaration as to the matters aforesaid, according to the law in this behalf made and subject to the punishment by law provided for any wilfully false statement in any such declaration.
- If you had read that would it not have struck you that the declaration was very indefinite in its terms? Well it is not quite so full as those which I am using at the present time.
7313. Ought there not to have been included in that declaration property in the Colony of New South Wales? I do not know that that should have been done. The declarant made a statutory declaration that he was worth the sum mentioned.

7314. Did you not know that Mr. Forrest and Mr. Gillan had an interest in the firm of Carter, Gummow, & Co.? I knew that both of them had been interested in previous contracts with Mr. Carter and Mr. Gummow. H. F. Norrie.  
6 July, 1896.

7315. Should not that have led to your making more strict inquiry, especially when you were going to take an exceptional security, as in this instance? The practice has been for the head of the branch to satisfy himself that the sureties were proper persons, and subsequently to take declarations from them that they were worth the amounts of the respective bonds.

7316. Did the head of the Department satisfy you in this case that the men were all right? It was not for me to call upon him to do so.

7317. How did the names of Mr. Forrest and Mr. Gillan come before you? The papers came before me with the names of Mr. Forrest and Mr. Gillan as the proposed sureties.

7318. Did you ask Mr. Hickson whether the bondsmen were all right? No.

7319. Did you ask Mr. Forrest or Mr. Gillan to state in what position they were? As a Justice of the Peace I took one of the declarations myself, and I put the usual questions to the declarant.

7320. In which case was that? I do not recollect in which case it was—I know that he declared that the contents of the declaration were true.

7321. Did he tell you what property he held? Yes; I recollect that when he gave his address at Dulwich Hill he said that he lived there on his own property.

7322. Did you make any inquiries as to the value of that property? No.

7323. Did you make any inquiries at all—for instance, did you ask the declarant where he banked? No; I made no inquiries whatever.

7324. *Mr. Smith.*] It is no part of your duty to make any inquiries? No.

7325. If you look at page 209 of the Parliamentary papers, you will see there a minute by Mr. Darley as to these sureties, that was approved by the Minister and minuted on to you, so that you had your ordinary instructions to prepare the usual documents? Yes.

7326. And upon those instructions you acted in the ordinary way? Yes.

7327. The ordinary course as to sureties prior to that date was not to take a declaration in all cases? Quite so.

7328. But in this case, for more abundant caution, you took a declaration from each surety? Yes.

7329. But you made no inquiry as to their standing, that being no part of your duty? No. I may mention that I had been for a number of years in the Crown Solicitor's Office, and I carried out down here the same practice I carried out up there. But in this case, the bond being larger than usual, and considering that it must be in force for at least three years, I took the precaution of taking a declaration from each surety.

7330. *His Honor.*] Do I understand that that had been done before only occasionally? If it had been done before it was only occasionally, but I cannot at this moment recollect a case.

7331. Upon what grounds do the Department usually go when they take bonds of sureties? The head of the branch takes the responsibility of making inquiry. I was never asked to make any inquiry as to the *bona-fides* or stability of the sureties. The head of the Department—that is, the Government Architect, the Engineer-in-Chief for Public Works, or the Engineer-in-Chief for Harbours and Rivers—when the matter was referred to him, would say whether the sureties should be accepted or not. In some cases they would accept the sureties, and in other cases reject them. If the sureties were rejected others would be asked for.

7332. You do not know what inquiries the head of the branch made in this case? No.

7333. You only attended to the machinery? Quite so.

7334. *Mr. Parkes.*] When you wrote your minute or letter to the Under Secretary, did you not observe that it was not correct and according to the declaration? I had not the declaration before me when I wrote that minute. Some of the words set out there are words which are used now in the declarations.

7335. But the declarations in this case do not set forth that the sureties are worth £6,000 over and above all just debts and liabilities of every kind? There are half a dozen words there which do not appear in the declarations.

7336. Then why did you write to Mr. Barling to that effect? I took it for granted that the declarations they had made were in the form of the declarations which are made at the present time.

7337. You furnished the declaration yourself, did you not—you were in the habit of drawing declarations of this sort? It is possible that I did draw the declaration, but I am not quite sure upon the point. I had with me at the time a clerk who had served his articles in Scotland, and I am not sure whether he drew up the declaration or whether I did so.

7338. But you knew the wording of it? Practically, I did.

7339. *His Honor.*] I understand that you made a mistake? Yes, When I saw the papers in print I saw that I had made a mistake to the extent which I have just explained.

William Joseph Larkin sworn and examined:—

7340. *Mr. Parkes.*] You were formerly in the Public Works Department? Yes.

7341. In what part of the service were you? I was foreman in the Metropolitan District under Mr. W. A. Smith. W. J. Larkin.  
6 July, 1896.

7342. When did you leave the Department? At the latter end of January, 1895.

7343. Do you recollect the works in your charge at Callan Park? Yes.

7344. Do you remember an open aqueduct being built there? I remember a culvert being built there on the outlet sewer.

7345. There were some Monier plates used in the construction? Yes.

7346. What happened to them? After the plates were put in they collapsed.

7347. And then what steps were taken by the Department? An order was then given to get rails in from Dover Point. I believe those rails were cut up and put under the plates to support them, but that would be after I went away. I do not know of my own knowledge whether that was done or not.

7348. Do you know who carted the rails to Callan Park? A day carter named Wilson. I gave instructions to him to go to Dover Point and bring the rails in.

7349. Who cut the rails? Parbury, the departmental blacksmith, who was working at Iron Cove.

7350.

- W. J. Larkin. 7350. You recollect a culvert on the Monier system being built on the Parramatta Road? I know that it was built there, but I was not there in the course of the construction. [*Vide Appendix No. 10.*]  
 6 July, 1896. 7351. You were told that something had happened to that culvert, I believe? I was told that it had collapsed.  
 7352. Who told you? I heard several men speak of it. It was the subject of general talk among the men.  
 7353. Did you hear that in that case the plates were also supported by iron? Yes; I heard that iron was put in.  
 7354. And that the iron was cut by the departmental blacksmith? Yes; I heard that the blacksmith cut the iron that was wanted. I do not know what was actually done, because my instructions were not to go near that culvert. Mr. Smith told me not to go near any work that Inspector Bramston was carrying out.  
 7355. Did you ever have any conversation with Bramston? No.  
 7356. Did you ever have any conversation with one of the maintenance men on the Parramatta Road? Yes.  
 7357. What did he say? He said that the culvert there had collapsed.  
 7358. What is his name? William Brown.  
 7359. Could you tell His Honor the name of any men who were working there? Ahearne, John London, Gilson; and I think Ryan and another man who was working at Callan Park were also there.  
 7360. Did you give any instructions concerning the cement to be used upon these two works? I sent the drays for it.  
 7361. Where did they go to? I do not know where they went for the cement.  
 7362. Was the cement obtained from Carter, Gummow, & Co., do you know? I do not know.  
 7363. *Mr. Gummow.*] Had Carter, Gummow, & Co. anything to do with these constructions? Not as far as I know.  
 7364. *His Honor.*] As to the collapse of this work, first of all what was the span of the arch in the culvert? I think it was about 5 feet across the top. That was at Callan Park.  
 7365. Do I understand you to say that you saw the arch being constructed? Yes, I got the moulds made. It was my duty as foreman to supply all the material for the work. I had to see that the men went to work, and that all the necessary material was supplied to them.  
 7366. Tell me all about the collapse—how it was that the arch collapsed? After the Monier plates were laid upon the top of the sewer they collapsed from their own weight. Two or three of the blocks sagged down in the centre.  
 7367. After the centering was taken out? Yes.  
 7368. How long was the centering left in? They were flat plates laid across the sewer. They were not arches.  
 7369. Then there would be no centering? There was centering, but it was removed before the plates were laid on.  
 7370. They were simply flat Monier plates? Yes.  
 7371. Of what thickness?  $2\frac{1}{2}$  inches.  
 7372. With a span of 5 feet? Yes.  
 7373. Did they sag down in the middle before any weight was put on them? There was no weight to go over them.  
 7374. Then what was the object of covering the culvert—were not the plates under a roadway? No. They were simply intended to cover up the sewer. It was the entrance to the reclaimed portion of the park.  
 7375. They were simply put on to the top of the sewer as a cover? Yes.  
 7376. But I suppose they were intended to bear the weight of a man, or some weight of that kind? Yes.  
 7377. But they were not intended to be covered over with earth? No; I do not think so.  
 7378. You say they were only about  $2\frac{1}{2}$  inches thick? I think that was about the thickness.  
 7379. They were made of a grill in compo.? Yes.  
 7380. Who made them? Gilson and London were the two men who mixed the compo. They were made on a platform alongside the work, and then moved on to the top of the sewer.  
 7381. How long after they were made was it when they were laid? I think it would be about four weeks from the time they were made until they were put on.  
 7382. Did they sag down at once? In a few days. I was carrying out other work at the time, and I was backwards and forwards at this place nearly every day.  
 7383. Were the plates quite flat? Yes.  
 7384. *Mr. Gummow.*] What cement did you use? I could not tell you what brand of cement was used.  
 7385. Was it cask cement or bag cement? Cask cement.  
 7386. *His Honor.*] Do you know the proportions of sand and cement which were used in the compo.? No.  
 7387. *Mr. Smith.*] As to the talk you heard about the falling down of these arches—did it refer to the work on the Parramatta Road as well as to Callan Park? Yes.  
 7388. You are sure that you heard the men say that the Parramatta culvert, as well as the culvert at Callan Park, had fallen in? Yes.

Joseph Barling sworn and examined:—

- J. Barling. 7389. What is your position at the present time? I am a member of the Public Service Board. I have been in that position from January of the present year.  
 6 July, 1896. 7390. Prior to that date what position did you occupy in the Public Service? I was Under Secretary for Public Works.  
 7391. As Under Secretary for Public Works all transactions which went before the Minister would be submitted to him through you? Yes, as a rule they would be.  
 7392. Do you recollect when the sewerage Contract 77 was signed? I do not remember the day on which it was signed.  
 7393. But you recollect the signing of it? I recollect that it was signed, but I did not see the signing of it.  
 7394.

7394. Did you consider the substitution of the Monier patent plan for the office design to be very risky? There was a certain risk, perhaps; although as far as I can understand it was not very great.
7395. You were a member of the Board of Reference at that date? I was Chairman of the Board.
7396. You recommended that in connection with this work special sureties should be taken? That was recommended by the Engineer-in-Chief for Public Works, Mr. Hickson, to the Minister.
7397. He recommended, you say, that special sureties should be taken? Yes, to cover any possible risk that might arise.
7398. Did you understand that those sureties were to be disinterested parties—that they were not to be associated with the contractors? They would be of no value unless they were disinterested. They certainly should not be interested in the contract.
7399. Or associated with the firm who were carrying out the contract? They certainly should not be connected with the firm who were carrying out that particular contract.
7400. On 9th April, 1895, you sent on the names of the two sureties, Mr. Forrest and Mr. Gillan, for the Minister's approval? Yes; they having been recommended by Mr. Hickson and Mr. Darley.
7401. What did you understand with reference to these two gentlemen? I took the advice of Mr. Hickson and Mr. Darley on the subject. I made no personal inquiry—in fact it would be utterly impossible for me to do so. There are let in the Department from 3,000 to 4,000 contracts a year, ranging over a large number of public works, and it would be utterly impossible for the Under Secretary to institute personal inquiry into such matters. Officers of the Department make inquiries, and as the result of those inquiries the names are put before me, and by me submitted to the Minister.
7402. Did you know whether, as a matter of fact, the gentlemen you have named did make inquiries? I know it from the papers.
7403. But you do not know it as a matter of fact? No; I made no personal inquiries at all. I took it to be quite sufficient that I had the advice of men of such standing as the Engineer-in-Chief for Public Works and the Engineer-in-Chief for Sewerage Construction.
7404. Had you known that Mr. Forrest and Mr. Gillan were partners in the contracts of Carter, Gummow, & Co., and Carter & Co., would you have accepted them as sureties? I certainly should have objected to them had I known that they were interested in that particular contract. I do not know that I should have objected to them as sureties had they been partners in some other contract.
7405. Suppose you had known that they had been formerly interested with these firms in from twelve to thirteen contracts, would you have accepted them? It all depends upon what could be shown as to their financial standing. I thought I had very complete evidence upon that point. In the first place, I had the advice of Mr. Hickson and of Mr. Darley, and, further, there were the statutory declarations made by each of the two gentlemen named as sureties that they held property to the value of the amount of the bonds, viz., £6,000 each.
7406. Did you understand from their declarations that they were worth property of the value of £6,000 over and above their indebtedness of every kind? I think so. If I remember rightly, that is set forth in the declaration.
7407. You would not have accepted them if you had not understood that? I should not like to say now what I should have done under the circumstances. Had it been proved that they were not worth the amount named I certainly should not have recommended their acceptance as sureties.
7408. Supposing it to be proved that Mr. Forrest was enjoying an interest in the firm of Carter, Gummow, & Co. in respect of Contract 77, would you consider the arrangement a proper one? If he were interested in that particular contract he should, of course, have been refused as a surety. I question whether he should have been accepted.
7409. But would it not have been a most improper thing to accept him—is it not altogether beyond question? I should not think it a right thing to accept him as a surety if he were interested in that particular contract.
7410. But is it not altogether beyond question. What is the good of sureties if that sort of thing is to be done. They ought to be absolutely disinterested, ought they not? In the particular contract, yes.
7411. Did you know that Messrs. Carter, Gummow, & Co. were connected with Mr. Forrest and Mr. Gillan in former contracts? I think I can say yes to that; but in the press of business I did not think very much about it, seeing that I had the recommendations to which I have referred before me.
7412. But considering what you knew about the connection of these two gentlemen with former contracts, would it not occur to you to make inquiries concerning them? I do not know that it did occur to me, or that it could be expected that I should do so. I supposed that inquiries had been made. I had the advice of the officers to whom I have referred, and I do not think that as Under Secretary for Public Works I ever made a personal inquiry. In cases of this kind the Under Secretary is obliged to act through the officers of the Department.
7413. But you sent a report to the Minister that these gentlemen were worth £6,000 each after their just debts had been satisfied, and that they were perfectly dissociated from the firm of Carter, Gummow, & Co.? That they were perfectly dissociated from the firm of Carter, Gummow, & Co. so far as this particular contract was concerned.
7414. It did not make any difference, you think, that they had been associated with the firm in former contracts? If they had been connected in other business with the firm that would not disqualify them for the position of sureties in connection with this particular contract if they showed that they were worth £6,000 each.
7415. Then what is to prevent all contractors from combining against the Government? It is impossible to take security against conspiracy.
7416. Coming to the cost of the works;—do you recollect this report being sent to the Secretary for Public Works? Quite well.
7417. Did you understand that Carter, Gummow, & Co. were substituting a plan of their own, and that the work under that plan was being paid for at 28½ per cent. reduced price? Perhaps I had better explain how that arose.
7418. What did you think at the time? I understood that Carter, Gummow, & Co.'s price at schedule rates ran out at £15,725.
7419. Upon the original design? I did not see it.
7420. Was it not submitted with the tenders? I dare say it was.
7421. Were you not Chairman of the Board of Reference? Yes.

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7422.

J. Barling. 7422. And were the designs not put before you? I am not certain on that point. I do not think these designs were. I should like to explain what is done at the Board of Reference. Each member of the Board brings his tenders to the Board, and the head of the branch who is responsible for the work says, "There are so many tenders, and such-and-such a firm are the lowest tenderers. The tender is so much." If it be in proper form, and if it be under the estimated cost, then it is passed by the Board. It is utterly impossible for the Board to go into all these details. Each member of the Board has his own work to perform, and it would occupy ten times the time now occupied to go into such details. When the head of the Department therefore explains that the matter is all in proper form nothing further is done. In this particular case I remember quite well the work coming before the Board of Reference. Mr. Hickson informed the Board that Messrs. Carter, Gummow, & Co., were the lowest tenderers, but that they had sent in a special tender for the work upon the Monier arch principle. He said he thought that, as they were the lowest tenderers, it would be a desirable thing to accept their tender, and that it would be a favourable opportunity to give this particular patent a trial. I remember quite well—and I think Mr. Deane will bear out what I say—that I said, "This is a question upon which neither Mr. Vernon nor I can possibly advise. It is a purely technical matter which I do not understand, and which Mr. Vernon also will probably not understand." Mr. Hickson thereupon explained that he and Mr. Darley had carefully gone into the plans and specifications, and also the cost, and that they were prepared to recommend that this particular system should be tried. Upon that explanation the Board unanimously came to the conclusion that it would be perfectly safe to try the work. It is the custom of the Board of Reference when any critical point arises as to the meaning of any specification or any particular feature in connection with a contract, or anything connected with engineering, to refer it to a sub-committee of the Board, who are specially acquainted with the subject, for their advice; and, although at this particular time no sub-committee was actually appointed, we had practically the same thing, because Mr. Hickson reported—and Mr. Darley was present at the time—that they had gone into the matter. The Board, on the recommendation of these two gentlemen, recommended that the principle be tried. It would have been of no use to submit the designs to me. I am not an engineer, and even if I were I should not have had time to go into them.

7422½. Was the plan of the Monier design before you the only plan that was shown to you? I cannot say.

7423. Had you ever seen that plan before? I do not think so.

7424. Have you seen the other plans of Contract 77? I do not think so. It is not customary for me to go into plans at all. Even if I were an engineer, I could not, as Under Secretary for Public Works, go into them.

7425. Did it not occur to you that in a work of this nature detailed quantities should be put before the Board? I do not think so. It would be impossible for the Board to go into such details.

7426. Supposing when the quantities were taken out and the price reduced by 28½ per cent. it showed a difference as between the two designs of £4,125, what would you have said? I should have said that it would be perfectly outrageous to accept the tender. If it were shown that the adoption of this Monier principle would mean a saving to the contractors of £4,125, I should say that it would be perfectly outrageous for anyone to recommend it. I do not believe for a moment that Mr. Hickson or Mr. Darley in their wildest dreams could have imagined such a thing.

7427. If this Monier plan, made by an officer of the Department, were submitted by the contractors as a substitute for the office design, do you not think that it would be a proper thing for the officer in charge to have taken out the quantities in order to ascertain what the real value of the lump sum undertaking on the part of the contractors was? I was perfectly unacquainted with the fact that an officer of the Department did prepare a plan for the contractors. I was very much astonished to see that evidence had been given that any officer of the Department had made this plan. I did not know it, and I certainly do not think that any member of the Board of Reference knew it. As to the main question of whether the relative values should not have been tested, I imagine that that was gone into.

7428. On the 3rd April, 1893, this letter was sent to the Department:—

"I have the honor to direct your attention to a patent, No. 4,084, issued on 3rd November, 1892, to Messrs. Carter, Snodgrass, and Baltzer, for the purpose of strengthening, and at the same time cheapening, the construction of sewer and other arches, as described in such patent as "invention of improvements" in concrete, cement, and mortar, building, and other constructions and manufactures.

I am desired by my clients to state that they are willing to dispose of their sole powers and rights granted in such patent, and to offer the same to your Department for the sum of £1,500."

Do you recollect that letter? Yes, now that my attention is drawn to it.

7429. Did you know that one of the patentees named here, Mr. Baltzer, was an officer in your Department? If I did, it entirely escaped my memory. But for your mentioning it now I should have forgotten all about it; but I do remember the circumstance now.

7430. Did you notice it at that time? I do not remember having done so.

7431. Would it not have been a better transaction to accept that offer of £1,500 than to induce the Minister to utilise this patent on our public works, paying 15 per cent. royalty on it? If it were found that the system were a desirable one to adopt in connection with bridges, it would be better, I suppose, to purchase it at £1,500.

7432. When papers are made up for Parliamentary returns, are not all the papers bearing upon the subject put into those returns? They ought to be. If papers in connection with a particular contract are asked for, of course all the papers bearing upon it ought to be printed.

7433. Could you tell me who made up these papers to be put before Parliament? Those engaged upon the work were Mr. Davis and Mr. Hungerford, I think. Eventually, the matter went to the chief clerk, Mr. John Portus, and I gave him particular instructions to see that every paper was submitted. I should be glad if I might be permitted to make an explanation in connection with these papers. A charge has been made in connection with these papers which were laid before Parliament that certain papers were kept back. I was never more astonished in my life than when I heard that that charge had been made. It must be understood that as Under Secretary for Public Works—as head of the Department—I could not go into all these details myself. It would mean a couple of days of hard work—the checking of all these papers. I gave most positive instructions that the utmost care should be taken to see that every paper bearing upon the subject was placed upon the Table of the House. Mr. Parkes in his speech, if I remember rightly, made the statement that he had asked for these papers two months before they were laid upon the Table. I think the papers themselves,

as



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as printed, quite disprove that, because on reference to them you will see that the return is to an Order of the Legislative Assembly of the 10th October, 1895. It will be observed that the papers were laid upon the Table of the House on the 22nd October, twelve days afterwards. I question whether, in any case, such voluminous papers were so quickly laid upon the Table of the House. Mr. Parkes also complained, I believe, that a great deal of padding has been put into these papers. The explanation of that is perfectly plain. It would have been impossible for us to have had these papers copied and laid upon the Table in anything like reasonable time. The Secretary for Public Works and I myself were extremely anxious that no charge should lie against us of endeavouring to keep these papers back, and in order to obey the order of the House as soon as possible, we laid the original papers upon the Table. We were anxious that no avoidable delay should take place, and, therefore, all the original papers were laid upon the Table. That is why they are printed in the form in which you see them. It was considered far more important that the order of the House should be quickly complied with, even if some unnecessary papers were printed, than that the usual time should be taken up in copying them. If any papers are missing, all that I can say is that they were not withheld to my knowledge, and I think it would be well if the clerk who had to do with the preparation of the papers were called before the Commission and were asked what instructions I gave him.

7434. The whole of the transactions in the acceptance of this tender do not appear from these papers; several important documents are missing from them? I can quite understand why that should be so, because some of the papers would not be under the heading of the contract.

7435. But I suppose there would be a portfolio for the papers connected with Contract 77, and surely all the papers in that portfolio ought to have been placed upon the Table? I am not aware that any were left out. If any were omitted, it was not done with my knowledge.

7436. Mr. Carter, on July 2nd, 1894, wrote a letter in which he said:—"Referring to our conversation *re* the use of our patent system of bridge and culvert building, we hereby inform you that the royalty we require for the use of the same by your Department will be 15 per cent. on the cost of construction";—Mr. Hickson had then tried the patent in connection with a little culvert 5 feet by 55 feet on the Parramatta Road, had he not? I remember his saying that he had done so.

7437. According to Mr. W. A. Smith, only one-half of the culvert was completed when Mr. Hickson wrote this letter to the Secretary for Public Works:—"The Monier system of concrete arching has been patented in the Colony by Messrs. Carter & Co. Where applicable, it reduces the cost of spanning an opening by about 50 per cent. The patentees are willing to allow the Department to use the patent on payment of a royalty of 15 per cent. on the cost of the arch. I recommend this for the Minister's approval. I might state, I have just completed, with the permission of the patentees, a culvert on the Parramatta Road built on this principle, with most satisfactory results financially and otherwise;"—do you think that the building of that culvert was sufficient justification for the Minister entering into an undertaking like this? I do not think it was sufficient standing alone, but Mr. Hickson explained, when recommending the patent, that it had been tried in Europe and elsewhere. I remember his showing either to the Tender Board or to myself—I think it was to the Board—a number of photographs of bridges of considerable size in the construction of which the principle had been used with great success. As to one of your preceding questions, I can quite understand how it was that Mr. Hickson was not prepared to recommend the purchase of the patent for £1,500 then, but subsequent information may have convinced him that it was a desirable thing to try.

7438. But why not have purchased it at that time? It was not offered then.

7439. It was offered twelve months before, and the offer was not withdrawn? That I do not know.

7440. If there were in the case of the culvert referred to a saving of 50 per cent. upon the ordinary design can you understand how it is that the arches substituted for the office design in the aqueducts at White's Creek and Johnstone's Creek would be almost equal in cost to that of the office plan? I believe they were not quite equal to the cost of the office plan. I think Mr. Hickson explained that. There did appear to be a discrepancy, and Mr. Young spoke to me about it—in fact it was clear on the face of the thing. Mr. Young said he had been told that the adoption of this principle would be the means of saving a large percentage upon the expenditure upon works of that kind, and he wanted to know how it was that such a small saving was estimated in connection with this particular work. I remember asking Mr. Hickson about it myself, and telling him that there did appear, upon the face of the thing, to be a considerable discrepancy. I remember asking him how it was that the saving was so small in the case of this particular work. The explanation Mr. Hickson gave me was this: that as this was the first time the principle was to be tried in a large contract it was desirable to take every precaution. He did not think it advisable to carry it out in the same way that it might be carried out in a much less expensive work. He suggested that the work should be made very much stronger, so that there might be no risk, especially in connection with a large work of this kind. If, he said, the experiment were successful, then we should be able to carry out the principle in other works, with the result that there would be a large saving in the public expenditure.

7441. But does it not look rather like testing the patent of a private individual at the expense of the country? If the work is made perfectly safe I do not think that can be said to be the case. It must be remembered that a heavy guarantee was to be taken from the contractors. Remember these are engineering matters into which I cannot enter.

7442. But when any person submits a patent to the Government ought he not to be made to first prove it at his own expense? To a certain extent the contractors were made to prove it at their own expense, because if the work failed in any way they were held responsible for it. The contractors guaranteed to maintain the work for three years. If I remember rightly, there was the guarantee of Carter & Co. for £12,000, and two separate sureties of £6,000 each. I may mention that the explanation of Mr. Hickson satisfied me, and I think it also satisfied the Minister, Mr. Young.

7443. Suppose it had been proved that No. 77 design was, as regards a great extent of it, the most costly work in aqueduct construction which the Department had carried out, do you not think that in accepting the Monier work at a figure equal to the figure for the Departmental design a rather extraordinary course was taken;—having regard to the risk, would it not be still more costly than the original plan? I should hardly think that, because if it should turn out that this Monier arch system is a success, it will eventually mean a great saving to the Department. That being so, I think the Department might readily take some small risk—and the risk, I think, was very small indeed—by allowing this patent to be tried, because I notice

J. Barling. notice that Mr. Darley, whose opinion I should accept as equal to that of any man in the country, said that in the Monier plan he had a work which was £257 cheaper, and which was, if anything, a better work than that on the original plan?

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7444. In this Monier work of course the whole of the contract is not aqueduct. There is a certain quantity of the work which is tunneling. Then there are the foundations of ordinary concrete to be considered. Can you understand why the Government should pay for that work which is not connected with the Monier principle at a price  $28\frac{1}{2}$  per cent. in excess of that for which contractors would undertake to carry out the work? That cannot possibly be the case.

7445. Let me refer you to the schedule of the Department? After all, these are questions which should be asked of an engineer.

7446. But would you have taken the course which you took in submitting this matter to the Minister had you known that what I now state were the facts? I had not divided the work up as between the Monier principle and the original plan; but if, as a matter of fact, the work could have been done at  $28\frac{1}{2}$  per cent. cheaper than the price at which the contract was accepted then it certainly ought not to have been taken at the price at which it was taken.

7447. Looking at the matter from a business and not from a professional point of view, I suppose that in case of a lump-sum contract the obligation on the part of the Government to pay for extras ought to be left out of it? No extras ought to be paid for except in respect of something completely outside of the undertaking; but I can quite understand a lump-sum contract being accepted, and there being at the same time a certain sum to be paid for extras.

7448. If the specification in the contract gives the contractors power to obtain extras there can be no doubt that if the lump sum were exceeded, and the contractors went to law upon the question, they could obtain the extras? They would not be entitled to any extras whatever for any work covered by the lump sum. If, for instance, the contract showed that concrete of a certain richness was to be put in, and if concrete of a higher quality were afterwards substituted, then in such a case of course extras would have to be paid in respect of that substitution.

7449. Provided that the contract specification allowed of the contractors receiving extras, the Government could not prevent the contractors from obtaining them? I think that is manifest.

7450. *His Honor.*] Have you had much experience in connection with lump-sum contracts? Yes, we have often had them; sometimes, for instance, a contract would be accepted in this way—the Department would have the alternative of accepting the contract at schedule prices or at lump sum. If, under such circumstances, a lump-sum tender were accepted the contractor would not be entitled to any extras whatever.

7451. *Mr. Parkes.*] Would you bind them down? They would be bound to do the work according to the specification.

7452. Does your contract in this case stipulate that there are to be no extras? The form of contract would show that. The contractors have to do the work as prescribed in certain plans and specifications for £15,500, no matter what the cost to them may be. If we accepted a tender for a lump sum that would cover all possible contingencies upon the work as shown upon the plans and specifications; but if, as I said before, concrete of a certain richness were mentioned in the specification, and the Department afterwards called upon the contractors to put in concrete of a higher quality, then extras would be paid in respect of that work. I am speaking now in general terms.

7453. *His Honor.*] Is there not always a qualification, as to the quantities, in all your advertisements? Take a case of this kind: Suppose the contractor were driving piles, and that a pile were shown to be broken; if it were a lump-sum contract the contractor would have to drive the pile as far as it would be necessary to go to reach a sound bottom; but, as I have explained, I do not go into these questions at all.

7454. In point of fact, in every one of your contracts is there not a condition that the Department shall not be bound by the accuracy of the quantities represented? There is something to that effect.

7455. And in a lump-sum contract the contractor takes the risk of that? Undoubtedly.

7456. *Mr. Parkes.*] As to these sureties, can you tell us of any other case where contractors have been taken as sureties for a certain contract when they have had business relations with the contractors prior to that date;—can you give us an instance? I cannot at this moment; but I quite agree with a remark which I saw from the newspapers that Mr. Darley had made that, in dealing with contractors, we should think a good deal more of the contractors than the sureties—that is to say, that if the Department is dealing with contractors of good standing it should not be so particular about the sureties.

7457. Not in a special case like this? This, of course, is a special case; but Messrs. Carter, Gummow, & Co. were contractors of very high repute in the Department. In saying that I do not wish to single them out from others whom I could name, because I could mention others equally reputable with Messrs. Carter, Gummow, & Co.

7458. Is not contracting a very precarious game? To the contractors; but I question whether in many cases it is a very risky thing to the Government. In ordinary sewerage contracts there is very little risk.

7459. In any case of this kind have you ever sent questions on to the Crown Solicitor connected with sureties and bonds? The Department has not sent directly to the Crown Solicitor. It has a bond clerk who is in constant touch with that gentleman. His instructions are that if there be anything outside the ordinary transaction he is to consult the Crown Solicitor. Mr. Norrie is in constant communication with the Crown Solicitor upon these points.

7460. Was the Crown Solicitor consulted in this case? That I do not know. I cannot say.

7461. *Mr. Smith.*] In this case there was no special point arising which would require Mr. Norrie to consult the Crown Solicitor? I do not think so.

7462. He was merely instructed to prepare the bonds in the ordinary way? Yes.

7463. As to these papers, I think you told His Honor that you instructed three officers to prepare them in pursuance of the order of the Legislative Assembly? I do not think I said I instructed three officers. I think I said there were three engaged upon the work; but I remember instructing the Chief Clerk to be very careful that every paper was put in which was connected with the contract.

7464. For aught you knew any paper which had any bearing upon any of the contracts was put in? Yes.

7465. There was no attempt to keep anything back, as far as you knew? No.

7466. With reference to the first letter, which we are told was not in the Parliamentary papers—I mean the letter dated 2nd July, 1894;—do you notice how it is headed? Yes—Roads and Bridges and Sewerage Branch.

7467.

7467. Is it at all likely that that paper may have been with the Roads and Bridges Department? It would be, I should say.

7468. As to the minute paper dated 18th July, headed in the same way, would not the same observation apply to that? Yes.

7469. And with regard to the minute of 9th September—Mr. Griffith's letter—that is headed "Metropolitan Sewerage Construction"? Yes, that would probably be there.

7470. These three papers, therefore, were probably not with the other papers? It is highly probable that they were not, although I cannot say for certain.

7471. At all events, you gave instructions that the utmost care should be used in the preparation of these papers for Parliament, and if anyone has told the Legislative Assembly and the public that in preparing these papers there was a glaring attempt to deceive the House, that is absolutely untrue? Absolutely untrue.

7472. *His Honor.*] Would not the heading "Contract 77," if it appeared in large lettering, as it appears here, on the original papers, almost ensure their being among the papers connected with Contract 77? The papers with the Water and Sewerage Construction Branch would be at the Water and Sewerage Board's offices. At the same time, it is quite possible that, owing to the hurry in which the return was prepared, some papers may have escaped attention.

7473. Where would be the main papers in connection with Contract 77? I am not quite certain; I cannot tell.

7474. Are the papers, directly or indirectly connected with every contract, always kept together, or do they get distributed? They get distributed very often.

7475. They branch off, I suppose, into different Departments? Yes; I thought it almost a feat to get these papers ready so quickly. It is not improbable that some papers here and there may have been displaced.

7476. I understood you to say that if you had had time to prepare the return more economically you might have cut out some of the papers which were printed? Undoubtedly. But it was considered both by Mr. Young and myself that the great point was to put the papers on the Table of the Legislative Assembly without a moment's delay; consequently the original papers were used. If the papers had had to be copied, and especially if copies of plans had to be included—and it was a question as to whether it was intended to put in the plans—I referred the matter to Mr. Young, and he thought it was not necessary, because it meant such an enormous expense;—if we had complied with the exact terms of the order, and had put in copies of both the papers and plans, it is quite possible that Honorable Members would not have had the papers even now. It is quite certain that copies of the papers and plans could not have been put upon the Table last Session. They could have been put upon the Table only at the commencement of the present Session, and perhaps not even then.

7477. *Mr. Gummow.*] In accepting tenders from firms who had put them in, is it the practice of the Department to accept the firm's name, or the names of the individual parties in the firm? If I remember rightly, the acceptance would be in your case Carter, Gummow, & Co.; but in preparing the bond, it would be Messrs. So-and-so, trading under the name of Carter, Gummow, & Co.

7478. In the case of any dispute arising, whom would you sue or look to on behalf of the contractors? I think the Department would sue the persons named in the contract. It is a question of law, but I think that would be done.

7479. Would you not consider that the parties who signed the bond would be the responsible parties to the Government? Yes.

7480. Do you remember when the plans were put in for Contract 77? I cannot say that I do remember.

7481. Do you know whether they were put in before the tender or not? I cannot say. The Under Secretary would have no time to examine all these matters at the time tenders are received.

7482. Do you remember ever speaking to Mr. Carter about coming in before 11 o'clock to do business with you? I cannot say that I do. It is possible that I may have seen someone before 11 o'clock. If there were any important business to be done I should not have any objection to see a contractor or anyone else before that hour.

7483. As to the tender sent in by Messrs. Carter, Gummow, & Co., do you know how many tenders they sent in for this particular work—for the Monier arch;—you will see the tenders on page 163 of the Parliamentary papers? I may mention that I do not examine the tenders in detail. That is done at the Engineering Branch. I see from the papers that two tenders were received.

7484. One was at 28½ per cent. below schedule rates, and the other was for a lump sum of £15,500? Yes.

7485. In your opinion, have those tenders any connection—the one at 28½ per cent. below schedule rates and the lump sum tender of £15,500? I think not.

7486. Do you think that the Engineer-in-Chief would connect them in any way? I should hardly think so. I should think the 28½ per cent. tender would be to guide him in a comparison between the lump sum tender and the schedule rate tender.

7487. They would be treated separately—they would not be combined in such a way as to make one tender out of the two? No.

7488. The Department would accept either the one or the other? Yes; certainly.

7489. As to contractors' work, you said that it was rather precarious;—do you think it is precarious to good men who understand their work thoroughly? What I said was that it might be precarious as far as the contractors were concerned, but that there was not much risk so far as the Government were concerned. What I meant was this—that the contractors might have to contend with fluctuations in the prices of labour and material—that they would have to take that risk—whereas the Government would have no risk.

7490. But do not other persons in business have that risk to contend with? Certainly.

7491. Do you think there is any greater degree of insecurity in the case of contractors than in the case of any other business, supposing that there are equally good men in either case? I can quite understand that some contracts would be eminently risky for the contractors. Such, for instance, as those where the element of the sea would come in. Take harbour works, for instance. They might be very risky.

7492. Take a case in which two experienced men carried out the work personally? I should not think there would be much risk in the case of sewerage works as far as the works themselves are concerned. Of course, there may be the risk of rise in prices.

7493.

J. Barling.  
6 July, 1896.

- J. Barling. 7493. In the case of men who have carried out such works as the Bondi and Rushcutter's Bay would there be much risk? Not as regards the carrying out of the work itself; but there might be from the rise of prices.  
6 July, 1896.
7494. But that risk would affect any one? Yes.
7495. *His Honor.*] As to the question of whether the department has formerly been in the habit of accepting lump-sum contracts,—what have you to say as to that? Sometimes tenders have been submitted at a lump sum.
7496. But in those cases were lump-sum tenders called for? Speaking from memory, I think there are cases where there was an alternative put before the contractors, and where the Government could accept tenders either at lump sum or at schedule prices. There would, however, be no difficulty in obtaining the fullest information upon that point. I am speaking now from memory.
7497. Has it ever been the practice to accept lump-sum tenders where tenders had been called for generally at schedule rates? No. In such a case tenders would be generally accepted at schedule rates.
7498. Do you know whether a lump-sum offer was made in any former case where tenders were called for at schedule rates? I do not remember a case at this moment. I should think it possible that it may have been so; but for the moment I cannot recollect any particular case.

James Henry Young, sworn and examined:—

- J. H. Young. 7499. *Mr. Parkes.*] You are Secretary for Public Works? I am.  
6 July, 1896.
7500. You recollect Mr. Hickson forwarding to you a report in which he stated that he found the Monier patent arch 50 per cent. cheaper than the ordinary design of the department? Yes. [*Vide Appendix No. 10.*]
7501. What did you understand from that? I understood that if we adopted the Monier arch at places where it could be utilised, the expense of the work would be reduced by that amount.
7502. That is why you accepted the offer of Messrs. Carter, Gummow, & Co. to do this work, and to receive 15 per cent. royalty? That is not at all the reason why I accepted Messrs. Carter, Gummow, & Co.'s tender to do the work. The one thing had nothing to do with the other.
7503. When you accepted the other, did you not understand that it would be equally cheap if it were applied in any position in arches? In any position in which it might be suitable. What I mean to say is, that the one thing had no bearing on the other. In the one case there was a distinct offer quite independently of the former proposal that we should pay something in the nature of a royalty upon the arch.
7504. Mr. Hickson's minute says, "Where applicable, it reduces the cost of spanning an opening by about 50 per cent.";—I suppose you would take that to be wherever it was used in an arch? Wherever we thought it justifiable to use it.
7505. On the second occasion, when the tenders for Contract No. 77 were submitted to you with the Monier arch design substituted, you wrote this minute to Mr. Hickson, "Before approving of this proposal, I should like an estimate of the actual value of the work to be carried out by the contractors under the substituted scheme"? At that time I did not know the quantity of the Monier arch to be used. I did not know how much Monier arch work there would be in the whole contract.
7506. What was your object? My object was this—that however satisfactory the Monier arch system might be represented to me to be, I would not have accepted the tender without putting up the specification under the system for public competition, unless it had been reported to me that the actual work to be carried out under the system approached very closely to the departmental estimate for the contract.
7507. If you had known at the time that the work for which the Monier system was to be substituted was the most expensive aqueduct work the office had carried out, would you have accepted the substituted value? I could not tell you that.
7508. If you look at page 6 of the Parliamentary Papers ordered to be printed on 9th October, 1895, you will see the following minute by Mr. Hickson:—
- To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm, estimates were made for the work on the Monier system, as well as on the Department's designs. The result was that the estimate of both works was practically the same. Applying that comparison to this case, it would mean that the Departmental estimate for the work under consideration would be £22,000.
- Supposing the work in the outfall sewer construction were to a great extent cheaper than the original design for Contract No. 77, would you then have accepted the Monier system as a substitute at the same price? I cannot say that I should. I can only make my position clear. The reason why I did it was that it was reported to me that the cost under the Monier arch system would be practically the same as under the departmental plan.
7509. Have you seen the departmental plans before? I do not think so.
7510. They were not submitted to you? I think not.
7511. You have some knowledge of building;—look at these plans and you will see the nature of the construction;—the arches and the facings are all of brick;—you will see that the cornices are of stone;—then there is the ellipse arch to be considered;—you will see that the sewer is bedded in concrete;—not only are the piers solid, but there is a considerable difference in the number of piers in the two designs;—have you not seen those plans of the original design before? No.
7512. If you look now at the Monier arch design, in which a three to one compo. is used, you will see that there is a less number of piers, and that they are all plain cement work;—if you had seen that plan before, would you have been disposed to accept it as an equivalent in value to the other plan? I could not tell you. I do not know the value of compo. work, nor the actual cost of brickwork. It is utterly unnecessary that I should know, so far as I understand the duties of my position.
7513. If you had seen these plans would you not have insisted upon an estimate of the two values being made? It is possible that I might have done so, but I do not think so. Mr. Hickson, the Engineer-in-Chief, was appointed to his position to advise me in all matters in engineering? Moreover, the plans were submitted to the Board of Reference, consisting of all the principal engineers in my Department, and I could not take it upon myself as a layman to refute the statements made by them.

7514. As a Minister you feel that you are compelled to rely absolutely upon those officers? The Minister is not absolutely compelled to do so, but the work he has to do makes it almost necessary that he should, unless he has strong reasons for doubting the *bona-fides* of his officers. J. H. Young.

7515. In all these professional matters the Minister can only arrive at a decision upon the reports which come to him from the heads of particular Departments? Practically that is so, when it comes to a question of engineering. 6 July, 1896.

7516. If these officers misled the Minister, no blame would attach to him? I should think not.

7517. On 5th April, 1895, Mr. Hickson wrote as follows:—

Messrs. Carter and Gummow ask that their own "personal sureties for the amount named," *i.e.*, £12,000 (an amount which they do not dispute), "should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work."

They go on to say that they are "a firm of sound financial standing, well and favourably known to the Department as contractors." This is quite true. They are a firm in which I have every confidence. They have done a great deal of work under me, and I can testify that their aim always has been to turn out the very best class of work possible. At the same time, misfortunes happen the very soundest firms of contractors, and the Department must look a little way into the future. Their own bond for £12,000 would be really of no use if they were unfortunate enough in the meantime to become bankrupt.

I think, therefore, it is right that the sureties should be insisted upon. They give the names of two men, Mr. George Forrest and Mr. James Gillan. From inquiries made, I believe these men to be financially sound, and I think if their names were accepted as the sureties in the penal sum of £6,000 each, the Department would be secured as far as it is reasonably possible to be.

I suppose you recollect that report. When you received it, did you think that Mr. George Forrest and Mr. James Gillan were absolutely independent of the contracting firm? Yes. I did not think they were parties to the contract in any way—in so far as I thought about the matter at all; but in these matters, as in engineering matters, I am to a large extent—to a very large extent—guided by the actions of my officers.

7518. If you had known that Mr. George Forrest and Mr. James Gillan were connected with the firm of Carter, Gummow & Co. and Carter & Co., would you have accepted them as sureties? I am sure I should not.

7519. Did you understand from the letter from which I have quoted, that Mr. Hickson had made special inquiries to ascertain whether these two gentlemen were worth £6,000 each? I understood that he had made full inquiries, but whether they were special inquiries or not, of course I did not know. That was a matter quite within Mr. Hickson's own knowledge.

7520. Did you have any conversation with Mr. Hickson upon this matter? Certainly not upon the question of sureties.

7521. Had you any conversation with him as to the acceptance of the Monier plan in substitution for the original Departmental design? I may say that before the tenders were sent in at all I had an interview with, I think, Mr. E. M. Clark, and either Mr. Carter or Mr. Gummow—one or other of them—when they asked me if it would be of any use for them to send in a substituted tender upon the Monier system. I did not commit myself to anything in reply except this, that there would be no harm in their sending it in. I did not pledge myself in any way, nor did I in any way lead them to suppose that the design would be considered. The understanding was that it might be sent in for whatever it was worth. I do not remember speaking to Mr. Hickson on the subject at all; everything was done through Mr. Barling. He was my Under Secretary, and, as a rule, all my conversations were with him. I could not say absolutely that I did not converse with Mr. Hickson upon the matter, but I do not remember it.

7522. You do not remember any conversation on the subject with him at all? No.

7523. I suppose the statutory declarations attached to the bond would not be put before you? They never come before me at all.

7524. Your position in this matter has been one of absolute guidance by your Departmental heads? Excepting that, as my minute shows, I looked a little more closely into it when I asked for a further report as to the value of the work. It shows that I did not act without inquiry. All my action was taken on the reports made by my officers.

7525. If the Monier work were not of the value of the office work, you were deceived by the minute which was sent to you on the 28th March? If that be so, no doubt it was a misleading minute. I am not prepared to say that it was. I do not know of my own knowledge whether it was so or not.

7526. Did you ever see Mr. Carter with Mr. E. M. Clark on any former occasion? I think this was the only time I ever saw him.

7527. Were you ever asked by Mr. E. M. Clark for an extension of a contract of Messrs. Carter, Gummow, & Co.? Not that I remember, but anything I may have done in that direction was not done upon Mr. E. M. Clark or Mr. Carter asking me to do so. I remember, however, giving them an extension of a contract without tender. It was represented to me, I think, that it would save the expense of an extra shaft—that, on the whole, there would be a considerable saving.

7528. Was that the work in High-street, North Sydney? Yes. It was a small contract at North Sydney, I think.

7529. Do you remember the reasons which were given for the acceptance of the offer? They all appear in the papers, I presume.

7530. Was there no conversation on the subject? Not between myself and Mr. Carter and Mr. E. M. Clark. There may have been some conversations between myself and my officers—either Mr. Hickson or Mr. Barling.

7531. Had you any conversation with Mr. Hickson when you agreed to the acceptance of the Monier patent and the payment of 15 per cent. royalty upon it? I do not remember it. I presume the matter would come before me through the Under Secretary in the ordinary way.

7532. Do you remember a test of the Monier system being made in connection with a culvert, 5 feet wide and 55 feet long? I do not know that that test was spoken of precisely.

7533. How long before the recommendation was made to you did you understand that that culvert was constructed? I really cannot remember. I think it is about 18 months ago since I accepted the recommendation.

7534. But did you have any conversation with Mr. Hickson about it? I do not remember.

7535. Were there any reports produced to you showing the cost of the culvert upon the two designs? There was no detailed estimate in any way. There was nothing more than is shown by the papers.

J. H. Young. 7536. *Mr. Smith.*] With regard to the acceptance of Mr. Forrest and Mr. Gillan as sureties in connection with this contract, I think you said, in answer to a question by Mr. Parkes, that if you had known that they were connected with the firm of Messrs. Carter, Gummow, & Co., you would not have accepted them? I think it is a condition of all contracts that all the partners of a firm must sign, and that the Department will not take one partner without the others. As the names of these gentlemen did not appear with the others at the foot of the contract, I did not suspect for a moment that they could be in the firm.

e July, 1896.

7537. Suppose they had no interest in this particular contract, would there be any objection to their acceptance as sureties if they were connected with the firm in other contracts? That is a question of law.

7538. But I mean from your point of view? I should not think there would be any objection to them if they were not partners as regards this particular contract.

7539. You said that you acted upon the advice of your responsible officers unless you had some strong reason for doubting the *bona-fides* of these officers? Not only their *bona-fides*, but their general character.

7540. Have you any reason for doubting the *bona-fides* of Mr. Hickson in regard to any of these matters? Not the slightest in regard to this or any other matter which has come before me. I have no reason to doubt his being deserving of the most implicit confidence.

7541. In your minute of the 10th December, 1895, you wrote as follows:—

Mr. Hickson may be informed that the statements to which he refers herein have never had the effect of diminishing the complete confidence I, as Minister, have always had in him in the important office he holds. That I cannot believe they will, in the slightest degree, affect his position with reference to his officers, contractors, or the general public, and that, having consulted the Cabinet as to his request for a commission of inquiry, I am able to state that my colleagues agree with what I have above written. If Mr. Hickson desires to place any rebutting statement before the public, I shall have much pleasure in laying it on the Table of the Assembly.

? Yes. I see that Mr. Hickson had asked at that time that a Royal Commission of Inquiry might be appointed to investigate the statements made by Mr. Parkes.

7542. That was after the first speech made by Mr. Parkes in reference to this matter? Yes. On 21st November Mr. Hickson wrote to that effect. He says, "I would therefore ask the Minister to consider the advisability of having these charges and statements thoroughly investigated by some independent authority, having full power to call witnesses and examine them on oath."

7543. The opinion which you expressed in your minute is the opinion you still entertain of Mr. Hickson? Yes.

7544. And you approved of the statements then made by Mr. Hickson being laid upon the Table of the House? Yes.

7545. If it has been stated that this firm of Messrs. Carter, Gummow, & Co. were connected with the Government in a most suspicious manner, that is absolutely untrue so far as you know? So far as I know.

7546. *Mr. Gummow.*] You mentioned that Mr. E. M. Clark, and either Mr. Carter or Mr. Gummow, called to see you before we put in our tender upon the Monier arch system? Yes.

7547. Did you promise that their tender should be accepted if it were the lowest? No; I said I could not make any promise of the kind.

7548. Can you remember what you said? I should not like to say that I remembered every word; but I can remember the effect of it. I think that what I said was that if they were lowest tenderers, and were therefore entitled to the contract under other circumstances, then, if they submitted a tender for a substituted design, it might be inquired into and reported upon.

7549. With what object? To save money to the Government, and also to give a trial to the Monier arch principle.

7550. In accepting the tender of the firm, was your object to assist the contractors, or did you consider that the country would benefit by the introduction of the new system? Your latter statement covers the only object I had in view. That, as I understood, was the object my officers had in view.

7551. To benefit the country if possible? Yes.

Edward Hungerford sworn and examined:—

E. 7552. *His Honor.*] You have been employed by the Department for some years, I understand? Fourteen years.

Hungerford.

7553. You knew Mr. Baltzer well? Very well.

7554. Are you intimately acquainted with him? Yes, very intimately.

7555. You lodged in the same house? Yes, for some years.

7556. Before he left the Department? Yes; before and after.

7557. I want to know what you knew from Mr. Baltzer as to his preparation of plans, or of a plan, for use by Messrs. Carter, Gummow, & Co., in connection with their lump sum tender for Contract 77? Mr. Baltzer was engaged for some time on those plans. I used to see him at work upon them constantly.

7558. Where was he engaged upon them? At home.

7559. Partly at home and partly in the office, or entirely at home? Entirely at home, so far as I know. I never saw him in the office, so that I cannot speak of what he did there; but we always came over from North Shore in the same boat, and I should certainly have seen him carrying plans. I presume he would not have had one plan at home and another in the office.

7560. Did he carry plans backwards and forwards? He may have done so once or twice, but it was not his custom.

7561. If he carried plans once or twice, do you know whether the plans he then carried were the Monier design plans or any other plans? Other plans I should think, because he was constantly at work on plans.\*

7562. Do you know from Mr. Baltzer how he came to prepare this Monier plan? Yes; in connection with the patenting of the Monier system.

7563. Were the plans to be used with the lump sum tender for Contract 77? He told me he was preparing them for that contract.

7564. At whose request? He never told me that.

7565. He simply said that he was preparing plans? Yes.

7566. You knew from him that these plans were going to be used in some way in relation to Contract 77? Certainly. 7567.

\* NOTE (on revision):—For the office.



E.  
Hungerford.  
6 July, 1896.

7567. Did you know what was going to be done in reference to them? He told me that an alternative tender was going to be put in.
7568. Did he tell you that as a secret, or openly? Quite openly.
7569. Did he ask you to keep it to yourself, or what did he say? He did not ask me to do so.
7570. Was the matter generally known to any other person beside yourself? I could not say.
7571. He made no secret of it? Not to me.
7572. Did you ever hear him speaking to anyone else about it? I could not say whether anyone else was present at the time or not. Probably there was.
7573. Did he say at whose request he was preparing these plans at any time? No.
7574. You knew that Messrs. Carter, Gummow, & Co. were going to tender? Yes, I understood so.
7575. Did you know that they were going to put in a lump sum tender in conformity with the plan which Mr. Baltzer was preparing? I could not say that I knew that they were going to tender at a lump sum. All that I knew was that the plans were for an alternative tender.
7576. By Messrs. Carter, Gummow, & Co.? Yes.
7577. Did you know at that time that they had the patent? Yes, in conjunction with Mr. Baltzer.
7578. *Mr. Smith.*] Had you anything to do with the preparation of the papers for printing in pursuance of the order of the Legislative Assembly? Yes.
7579. Who worked with you in their preparation? No one.
7580. Were you the only officer engaged in their preparation? I and Mr. Davis. We asked Mr. Norrie's advice on one or two occasions.
7581. You prepared the papers for Parliament in the ordinary way? Certainly.
7582. You are continually having to do such work? Very frequently.
7583. Was there any exception made in this instance? No.
7584. You prepared all the papers which you could find which you thought ought to be printed? Certainly. There was no intention of keeping back anything. Nothing was kept back.
7585. As far as you know nothing was kept back? No.
7586. If it should turn out that any papers were omitted those papers would not have been in this department? No.
7587. *Mr. Parkes.*] Do you keep all the papers in connection with particular contracts in portfolios similar to those which you see on the table? We used to.
7588. They were always kept in that way? Yes.
7589. At the time this return was made up were they kept in that way? Yes.
7590. Therefore, any papers in the portfolios ought to have been with the papers which were laid upon the table of the House? Not necessarily.
7591. You selected the papers for the House? Yes; the only things taken out were some minor matters such as papers having reference to requests for a day's leave of absence—papers which were utterly immaterial.
7592. You selected from the papers those which were laid before Parliament? Yes.
7593. Supposing there were a letter from a Member of Parliament asking that a particular contract might be given to a firm without tender, that would be put in one of the portfolios? Yes.
7594. If it were in one of the portfolios, ought it not to have been picked out for submission to Parliament? If it were there.
7595. Take the paper showing that Mr. Young had authorised the payment of a royalty in respect of the Monier arch;—would not that have been among the papers? No.
7596. How would it appear among the papers ultimately? I think, as far as I remember, we put that paper in as having some bearing on the case—that is, upon one of the contracts of Carter, Gummow, & Co.,—as showing how the Monier system may have been introduced.
7597. Would it not be kept with the other papers? No. It had nothing to do with any of their contracts.
7598. Did you not select the papers from the portfolios? Yes.
7599. And some you rejected, while others you selected? I did not reject any of importance. We took the papers from the portfolios.
7600. But you did not lay all the papers in the portfolios on the Table of the House? Not papers, where for instance, an inspector would ask for a day's leave of absence.
7601. You eliminated some of the papers? Yes, certainly.
7602. *His Honor.*] Do you know whether the papers having reference to the introduction of the Monier system which have been referred to to-day—the letter of Mr. Hickson, for instance, of the 18th July, and the letter of Mr. Carter, of the 2nd July, and also the letter of Mr. Griffith, asking for approval of the new schedule for the making of progress payments on Contract 77,—were eliminated? They would not have been eliminated if they had been there at the time. No papers which had any connection with the contracts were eliminated.
7603. You are sure they were not eliminated? I am sure they were not. If they were there, they would certainly have been printed. It was about this time that Mr. Parkes' question was answered, and the papers may not have come in then.
7604. The letter of Mr. Griffith, for instance, has been registered? Yes. It was registered at the Water Supply and Sewerage Board. You will see their stamp on it.
7605. Would that indicate that it might not have been among the papers at the time you made up the Parliamentary return? We may not have known anything about it. It may never have been in the office at all; it probably would not have been.
7606. *Mr. Smith.*] It was minuted on to Mr. Adams, the clerk to Mr. Darley, on 12th September, and it was signed by Mr. Adams, showing that he had sent a copy on to the Engineer-in-Chief on 30th September—That would show that the paper was in that Department up till September 30th? Yes.
7607. The probability is that it was floating about there after that? Yes.
7608. This other minute of 18th July has nothing to do with sewerage contracts—it is a Roads and Bridges matter? Yes. Of course there may have been a few papers omitted, but there were not instructions to omit any.
7609. You exercised all the care you could in making up the return? Yes; speaking from memory, I was about three weeks in the room by myself with all the papers relating to the contracts. Mr. Davis used occasionally to come in and help me.



WEDNESDAY, 8 JULY, 1896.

John Carter, recalled and further examined:—

- J. Carter. 7610. *Mr. Parkes.*] You managed the whole of the financial business of Carter, Gummow, & Co.? Yes, pretty well.
- 8 July, 1896. 7611. On 1st July, 1892, on 1st September, on the 1st November, and on 30th December, Government cheques paid to H. Rudolph were handed to you and paid into the Bank of New Zealand;—did those cheques represent his salary? Yes, I believe so. I do not remember the dates upon which the transactions occurred.
7612. How came the transactions to occur at all? They were private matters between Mr. Rudolph and myself.
7613. Did you lend him money? I did.
7614. And he repaid you in this way? Practically he did. He may have repaid me some balance in cash.
7615. On April 19th, 1892, you drew a cheque in favour of Henry Rudolph for £250? I believe so.
7616. Was that the same Mr. Rudolph? Yes.
7617. Was he an inspector? No; resident engineer.
7618. For what district? He had no district as far as I am aware.
7619. Was this cheque for money lent to him? It was money I was lending to him.
7620. On May 26th, 1894, another cheque was drawn in his favour for £40;—does that also represent money lent to him? I have not a clear recollection of that, but I should say that it would be so—in fact I think I can say for certain that it was. It could not have been for any other purpose as far as I know.
7621. Do you know an inspector named O'Hanlon? No. I knew an engineer of that name.
7622. Was he resident engineer on some of these contracts? Yes.
7623. What was his full name? Charles Unthank.
7624. Had you any transactions with O'Hanlon? I had.
7625. Did you pay him on July 6th, 1894, the sum of £145? It is very probable that I did.
7626. And £150 on July 26th, 1894? Yes.
7627. £60 on April 30th, 1894? Possibly.
7628. On September 6th, 1894, £60 in cash? Yes.
7629. Were these amounts loans also to resident engineer O'Hanlon? They were.
7630. In connection with any particular transaction? Yes. I will give you an explanation later on as to the whole of these transactions.
7631. On June 18th, 1895, a Mr. S. H. Wheedon was also resident engineer? Yes, but not in the Sewerage Department.
7632. *His Honor.*] In what Department would he be? I think, in the Country Towns Water Supply Branch.
7633. *Mr. Parkes.*] He had formerly been a resident engineer in the Sewerage Department? Yes.
7634. Did he pay into the account of Carter, Gummow, & Co., the sum of £2,000 on June 18th, 1895? He did not.
7635. But that sum of money was paid in on that date? Certainly—by me.
7636. Was it not made up of two cheques or of a cheque by Mr. Wheedon? There was one cheque, as far as my recollection goes, for £2,000.
7637. That was paid into Carter, Gummow, & Co.'s account by you, and it had been given to you by Mr. Wheedon? Yes.
7638. Was Mr. Baltzer an officer of the Department? Certainly.
7639. Did he on 31st March, 1896, pay into your account a Government cheque for £159 17s. 5d.? No.
7640. Did he pay it to you? No; it was paid by the Treasury.
7641. But upon his order? Certainly.
7642. What was it for? It was his retiring allowance. It had been owing for some considerable time; I could not say the exact number of months.
7643. Why was it paid into your account? Because I was his agent.
7644. Referring again to the £2,000 paid into your account by Mr. Wheedon;—why was it paid in? It was a private matter between Mr. Wheedon and myself. It had nothing to do with the firm's business.
7645. Was it payment for an interest in your concern as a partner? No.
7646. Could you explain the payment? Yes. The facts are pretty well these. Mr. Wheedon's father died some time ago—I do not know exactly when—and he left him this sum of money. Mr. Wheedon was desirous of investing it, and he consulted me repeatedly during some months as to the purchase of land and the building of a house. I may say that, residing, as I do, at North Shore, I have dealt in land and that kind of thing there for a number of years, and I am looked upon somewhat in the light of an authority upon that subject. Having known Mr. Wheedon very well for a number of years, he very naturally consulted me in the matter. He acted so far upon my advice as to investigate matters in connection with several pieces of land, and to draw out plans for his house, and so on; but, owing to sudden changes in the Works Department, and the insecurity of his position—no Civil Servant felt very happy or secure in his prospects at that time—he decided that he would not go on with his land and building investment. He said, "I want some return, and I think I will put the money out on mortgage. Will you advise me what to do with it?" I looked about and I could not see anything very tangible or anything which could prove very remunerative to Mr. Wheedon. After some weeks had elapsed I said, "If you can get no other investment I will take the money and will give you security for the amount." This was some months after he had received it from his father. After we had gone extensively into the question of building and so forth he handed me the £2,000, and I handed him my security, which he now holds. Those securities were solely my property. That, in brief, is the history of the transaction.
7647. *Mr. Gummow.*] Did you pay any interest upon that advance? Interest at the rate of 6 per cent. was paid, and I received it back from my firm.
7648. What security do you say there was? My own personal property, land at North Shore and various places.
7649. It had nothing to do with the company's property? No.
7650. Was there any other security which you gave in the shape of a bill;—did you hand him a promissory-note? Yes; I did, but I had forgotten that.

J. Carter.  
8 July, 1896.

7651. For what amount was the note? I believe for the full amount of £2,000.
7652. What was the exact property upon which the money was lent? Various blocks of land at North Sydney.
7653. Could you name them? Yes; there was land in Alfred-street, North Sydney.
7654. What are the numbers of the allotments? I could not tell you now.
7655. Would it be the whole of the land you own in Alfred-street? Yes.
7656. Was there any other land there? Yes; land in Hill-street and Miller-street.
7657. Any other? Not that I can think of now, but I will look up the matter and see.
7658. *His Honor.*] Was it a registered mortgage or an equitable mortgage? There was a document, executed by Johnson, Minter, and Simpson, to protect Mr. Wheedon. That was done by his instructions.
7659. *Mr. Parkes.*] There were some cheques paid into your account by the Sydney Mint as follow:—On April 10th, £242; on December 7th, £257; on February 24th, 1896, £304; and on March 25th of the same year, £67. What were these amounts for? Am I supposed to answer these questions, your Honor? These payments had really nothing to do with any of our contracts, or with any Government officer; they were entirely outside transactions. I do not think I should be cross-examined upon every cheque I draw.
7660. *His Honor.*] Have you any objection to answer the question? No; I can answer it in every detail.
7661. Then I think it would be more satisfactory for you to do so? These payments were revenue from, and the sale of, the Post Office gold-mine in Stewart Town.
7662. *Mr. Parkes.*] To whom did you sell that mine? To the company who are working it now.
7663. Of whom did the company consist? I could not tell you; I never saw the men. They have been working the mine for the last two years. It is a company, and that is all I know about it. I had nothing to do with the transaction except to receive the moneys and satisfy the purchasers that the matter was quite correct.
7664. There were some payments made in cash to H. Boehme? That is in connection with the same matter—the Post Office mine.
7665. With reference to the sales of cement made to other contractors, I suppose the cheques paid by Ahearne, Carson, Flood, Flood & Rutherford, Matheson, and Langley, represent sales of cement; I see that Ahearne paid in £276 10s. 8d.,—that is for the purchase of cement, is it not? I could not say at this moment what it was for.
7666. I am referring now to a payment on April 17th, 1895? I lent him some; I do not know that I sold him any. Some was transferred through a merchant to him; but whether he paid us or the merchant I could not say. We had other transactions in plant, metal, and so on, for which he paid me; but whether the cheque refers to that or to the sale of cement, or to the three combined, I could not say.
7667. How much cement did you sell him? I did not sell him any. I do not sell cement. I oblige persons with cement, sometimes, when they are stuck up for it.
7668. *Mr. Carson*, on August 7th, 1894, paid in a cheque for £107 5s. 9d.—that would be for cement? Possibly, for material of some sort.
7669. Then there were cheques by Flood, and Flood and Rutherford, on December 3rd, 1892, for £17 11s. 10d.; on January 10th, for £10; on June 3rd, for £200? I do not think I can answer those questions definitely from memory.
7670. Was not the payment on January 10th, 1892, for cement? Possibly.
7671. Was not there a period when you had all the tested cement, and when all the other contractors had to come to you for it? Not at that time, I think; but the thing occurred last year or the year before last.
7672. Other contractors had to buy off you? No; they borrowed from me. I do not deal in cement.
7673. Did they pay you in cheques or in money? They did both, I think, just as it suited them.
7674. Then there is a cheque by Danaher, Taylor, and Britton, for £300 9s. 9d.? Yes, that was for cement.
7675. And a cheque for £30 by P. H. Osborne, on April 11th, 1896—a cheque on the Commercial Bank—had that anything to do with cement? I do not even remember the cheque.
7676. *Mr. Gummow.*] Do you remember some one coming to you and asking you to exchange a cheque? Yes; I remember now that I did exchange a cheque. I remember now that a man who could not get a cheque cashed came to me and I gave him my cheque in exchange for it, paying the cheque I received from him into my account.
7677. Are your business transactions with Mr. Snodgrass completed;—does he still hold an interest in the business? They are completed. He holds no interest in the business.
7678. When did he leave the firm? At the beginning of the year.
7679. There is a cheque paid into your account by Mr. W. A. Smith of £20 5s.; was it not for cement? I could not tell you. Is it a public officers pay cheque?
7680. Yes. Was not that cement supplied for the culvert on the Parramatta Road? No; I do not think so.
7681. Do you remember whether in 1895 Mr. Smith did get twenty-five casks of cement from you? I think that at that time, if I remember rightly, he was hard up for cement, and like everyone else, he came to Carter & Co.
7682. If the quantity corresponds with the vouchers in the Department in connection with that particular work, would the cement not have been used in that way? The payment could not be for anything else, as far as I know. I have no recollection of the transaction. It was a very small matter, and I did not take particular notice of it.
7683. *His Honor.*] The date given would be sometime after the cement was supplied? Yes. I do not remember the transaction, but I know that Mr. Smith did come and get some tested cement because he was short himself. I may make this remark—that Mr. Parkes asked me the other day whether we ever received any royalty from the use of the Monier patent, and I answered him then as far as I could remember. I am informed that we received £2 5s., but I had no recollection of the circumstance then.
7684. Did you not also receive the sum of £13 8s.? I do not know, speaking from memory. If you could tell me of the occasion I could think of it, perhaps; I know that when I heard of the other amount it came as news to me.
7685. *His Honor.*] Would that payment be in connection with the work at Callan Park? Yes.
7686. *Mr. Parkes.*] You have told His Honor that your firm kept no books? Yes.

7687.

- J. Carter. 7687. Then how would you conduct your business transactions when you bought in cash? We never bought in cash.
- 8 July, 1896. 7688. Never on any occasion? Never, except small amounts.
7689. If you were importing material would you not have to keep books in connection with those transactions? We never import.
7690. I see from the papers in Contract 79 that you were allowed first of all a 2 inch margin and that latterly you were allowed a 3¼ inch margin of cement outside of the actual lining of the sewer? Yes.
7691. Do not you think that you got a good deal of advantage over the Government under that arrangement? No.
7692. Was it not a big margin? It was not big enough, if anything. There was not an ordinary margin to begin with.
7693. Take the average of your blowing out—you would not blow out much beyond 3¼ inches? Yes, we should. I wish we could always keep it down to 3¼ inches.
7694. What would be the average? I could not say. It would be much bigger than that.
7695. Would it be 6 inches? I could not say. I have no practical knowledge of these matters. I know, at the time, I was consulted in reference to this matter, and we looked upon it as a very neat thing. We thought we were being "got at," as it is termed, by the Department.
7696. You had to fill it all in solid with concrete where you had blown out? Yes; no matter whether it was an inch or a foot.
7697. Having regard to the dimensions which were mentioned by Mr. M'Creddie in connection with his inspection, do you not think you were allowed a big margin? You are referring now to another contract.
7698. It was a continuation of the same contract;—was the drive in 79 blown out much more than in 79 A? I could not say. I was never down in the tunnel in my life.
7699. Do you not think that in paying you £1,250 for the substitution of blasting for guttering and gadding the Government got a long way the worst of the bargain? They got a long way the best of us, and I always told them so.
7700. Why had you to put so much concrete there? It was not a question of concrete. It was the question of delay and the extra cost of gadding.
7701. But did you not get an advantage in having 3¼ inches of concrete put in? No advantage.
7702. Would it not be to your advantage if you had been paid up to the full excavation? I could not tell you. I know that it was looked upon at the time as a very neat thing indeed.
7703. You thought the margin should have been much larger than that? Certainly. I should like, before my examination is concluded, to make an explanation as to Rudolph's matter. He is an old personal friend of mine. His wife is a personal friend of my wife. We are very friendly. I think we were the only friends they had in New South Wales at that time. He, being a steady man and anxious to improve his position, purchased a house and land at Marrickville, for which he was promised money by another friend of his—it is a German name, and I forget it. At all events, Mr. Rudolph entered into negotiations, and finally purchased this property. As far as I can remember, when the time came for the money to be paid, it was discovered that his German friend's money was locked up, and that it could not be got at. Mr. Rudolph came to me about it, and, knowing him as I did, I advanced him the sum of £250. I think that was to pay the first instalment—whatever he may have agreed upon as the first instalment—on the building. Mr. Rudolph undertook to pay me back, every succeeding month, the full amount of his salary, whatever it may have been—£32 or so, I think. He did so for some little time, and then he said, "I find I can save more than the £32. I will pay you something in cash." I presume he paid the cheques into his own account, and cashed them. His wife, on more than one occasion, brought to my wife sums of £35 and £40, and they were placed to Mr. Rudolph's credit until the whole sum of £250 was repaid. I know from personal observation that Mr. Rudolph and his wife not only strained every point to pay the money back, but that they actually denied themselves the common necessaries of life in order to do so. Upon more than one occasion I remonstrated with them and told them to take their time, and that they were not to go in for any niggardly cheese-pairing and scraping in their household affairs simply in order that they might be able to repay the money a month or two sooner than they would otherwise have been able to do. That is the history of Mr. Rudolph's transaction, as far as I know it. As to O'Hanlon's business, his mother was rather a wealthy woman living at home, and she told him, on the occasion of his marriage, that she would send him out sufficient money to build a house for himself. He, knowing that we were in touch with building and that sort of thing, consulted me. I assisted him in the purchase of the land and in the design of his house, and also in the purchase of the material. I supplied him with a good working foreman also to carry out the work. I advanced him a sum of money temporarily, and when the house was sufficiently advanced to entitle him to receive some money on it—before his mother sent him the money she had promised to send him—he obtained a loan from some one through Johnson, Minter, and Simpson, and executed a mortgage covering me so far as the amount I had lent him was concerned. When the money was received from England, or Ireland—I forget which—Johnson, Minter, and Simpson repaid the advance of £600 to my account, that being the amount of Mr. O'Hanlon's indebtedness. The whole transactions were done through Johnson, Minter, and Simpson, under mortgage.
7704. *Mr. Smith.*] Since the occasion of this loan to Rudolph has he been supervising any of your contracts? No.
7705. And so far as Mr. O'Hanlon's matter is concerned, has he been supervising any of them? No.
7706. Neither of them has done so? No.
7707. *Mr. Parkes.*] Did they sign any of your vouchers? Not that I am aware of. It would be news to me to find that they had done so.
7708. *Mr. Gummow.*] As to Mr. Rudolph, when did you draw the £250 to give him;—was it from your own account? I could not tell you, but I think it was from Carter & Co.'s account.
7709. Was it Carter and Co. who made the loan to Mr. Rudolph? No.
7710. Then why did you go to Carter & Co. for the money, if they had nothing to do with the transaction? I drew the money on my own account, and I was responsible for it to the firm. There was no money in my own private account at the time, and I borrowed £250 of Carter & Co.
7711. If Mr. Rudolph had not paid the money back, who would have suffered? I should have had to repay the money to the firm myself.

7712. Do you recognise that acknowledgment? Yes; it is as follows:—"We hereby acknowledge the receipt of £250 from Mr. J. Carter, and promise to pay the same back at the rate of £30, payable every two months after the first day of May. The balance between our payments and the full amount of £250 to be paid on 1st May, 1893, should Mr. Carter wish us to do so." J. C. Carter.  
8 July, 1896.
7713. By whom is that signed? By Mr. Rudolph and by his wife.
7714. Do you know why his wife signed it? As a double security, I suppose, so that in the event of Mr. Rudolph's death we might look to her for the repayment of the money.
7715. You say you lent some money to Mr. O'Hanlan? Yes.
7716. Did the firm of Carter & Co. lend him the money, or did you? I lent it him.
7717. From what account did you draw it? From the firm's account.
7718. And did you hold yourself responsible to the firm for the amount? Yes.
7719. Was the money paid back to you or to the firm? I think it was repaid to Carter & Co., on my instructions. I see from the acknowledgment you now hand me that the payment was made to Carter, Gummow, & Co. The memorandum from Johnson, Minter, and Simpson, says:—"In accordance with your request, we have to-day paid into the Bank of New Zealand, Pitt-street, to the credit of Carter, Gummow, & Co., Contract 69 account, the sum of £600."
7720. Do you know where the document in Mr. Weedon's case was made out and signed? No.
7721. On what date did Mr. Weedon pay the money, do you know? On 18th June, 1895.
7722. Do you know where Mr. Weedon was employed then? Yes; in the Water Supply Branch.
7723. Had he anything to do with the Sewerage Branch at that time? No.
7724. As to Mr. Baltzer, you paid a cheque for £159 into his credit—why did you pay that amount in? The Treasury paid it in.
7725. Why did they pay it into the account of Carter, Gummow, & Co.? Because I undertook to look after the money for him. The Treasury had an order to pay it into our account.
7726. Where was Mr. Baltzer at the time? In Germany or Austria.
7727. You acted as his agent while he was away? Yes.
7728. Have you repaid that money to anyone? Yes; it was repaid to Messrs. Laurence and Rich, solicitors.
7729. As to the dealings you had with the Mint, what were they? They were in connection with a return of gold smelted from the Post-office mine; after settling up with Boehme for wages and paying a half share.
7730. Did you not tell Mr. Parkes that this money was in connection with the sale of a gold mine? Perhaps I did. I do not know whether I meant to convey that impression. Now that you correct me I know that the amounts were for the gold.
7731. You received cheques from the Mint and shared the money with the parties interested, and Boehme was one of those parties? Yes.
7732. As to the cheque of Ahearne's for £270 which was paid in—what do you say about that;—do you remember whether Ahearne deducted £18 from one of the accounts you had with him for a special object? Yes.
7733. Do you remember what account it was? Yes; it was for white metal.
7734. Do you remember roughly the quantity of metal? No. I know it was a good large quantity, but I could not remember the quantity now.
7735. Do you think the amount would be £300? I could not tell you.
7736. Do you remember £18 being taken off the amount for squaring up? Yes.
7737. You objected to it? Yes.
7738. It must have been a good big lump of metal to justify the taking off of that amount for squaring up? Yes.
7739. As to these loans you made to other contractors of cement and different material—did they pay you any interest on the loans? No.
7740. Did you derive any benefit from the lending of the cement? No.
7741. Did you get any of the cement returned? Sometimes, I expect. It was done in various ways; whichever way would suit them suited me.
7742. But did you get any benefit from the transaction? I had always plenty of bother and very little benefit.
7743. *Mr. Parkes.*] The last money you gave to O'Hanlon was £60 in cash? Possibly.
7744. Did you ever give cash to any other officer of the Department for any reason? Not that I am aware of.
7745. But did you do so? Not that I remember. I should say not. I did not give Mr. Rudolph cash. It was all in one cheque.

George Christie sworn and examined:—

7746. *Mr. Parkes.*] What are you in business? A public accountant,
7747. You have an extensive practice? Yes, I have been some ten years in practice.
7748. At the present time you occupy the position of City Auditor? Yes.
7749. What other positions of the kind do you hold? I do auditing for various companies and large firms.
7750. But what public positions do you hold as auditor;—do you not make municipal audits? Yes, a large number; and I have done various work of the kind for the Government from time to time.
7751. Acting upon my instructions you examined the various accounts of merchants in the city showing their sales of cement to Carter & Co., Carter, Cummow, & Co., and the bills of delivery and other particulars in connection with their various contracts? Yes, I have been engaged in the investigation for some days.
7752. You have gone thoroughly through such cash and other books as have been given to you? Yes, I have taken as my basis of operation the bank pass-books and the cheques for the payments which have been made as shown therein.
7753. You have made a thorough search through the books of all the merchants who have supplied cement to these contractors? Yes.

G. Christie  
8 July, 1896

7754.

- G. Christie. 7754. And you have no doubt in your mind that you have found them all? Yes.  
 7755. You have perused the ledgers of these merchants? Yes. I have visited the offices, and I have seen the principals of the whole of the establishments whose names appear in these books as vendors of cement.  
 7756. And they have supplied you with all the necessary information? Yes. The firms in all cases where they have sold cement to Messrs. Carter & Co. and Messrs. Carter, Gummow, & Co., have supplied me with full information.  
 7757. They have given you certain statements with reference to those sales, have they not? Yes; they have furnished information in writing, and I have found that it agrees with the information conveyed by the books.  
 7758. You have checked everything, and you have no doubt in your mind but that your audit is perfectly correct? That is so.  
 7759. From the year 1892 to the year 1896—(say) from the month of June—how much cement, taking the number of barrels, was bought by Carter, Gummow, & Co. and sent to the various contracts on which they were engaged? I have prepared a report so that the information might more clearly be put before the Commission, and I will read it—

## MEMO. No. 1

Re the delivery of cement on Messrs. Carter & Co.'s and Messrs. Carter, Gummow, & Co.'s contracts, from 1st January, 1892, to 30th June, 1896.

(a) Reference is made to the evidence taken before the Commissioner, and to Mr. J. Carter's examination, 29/6/96, and his reply to Questions Nos. 6403 to 6411.

(b) The contractors having, in their examination before the Commissioner, stated that all payments for cement would appear in their firm's banking accounts, the bank pass books of their several accounts, and the cheques relating thereto, were carefully examined.

The vendors of cement whose names thus appeared were visited by me personally. I inspected their books (with the exception of those of Mr. John Try) relative to their transactions with the contractors, and obtained from such of them as had sold cement to the contractors since 1st January, 1892, full particulars of their sales and deliveries. And, as to the purchases from Mr. John Try—the agreement with him dated 13th May, 1895, being for colonial cement in bags at a price equal to 9s 6d. per cask delivered at Railway Station, Darling Harbour, for Annandale, and the payments to Mr. Try amounting to £588 6s.—the deliveries from Mr. Try have been set down at 1,200 casks.

(c) From these and other inquiries I have been able to produce the accompanying statement, which sets forth the whole of the deliveries of cement on the contracts of Messrs. Carter & Co. and Carter, Gummow, & Co., from 1st January, 1892, to 30th June, 1896. This statement shows a total of 21,572 casks of cement, distributed to the various localities as follows, viz—

|   |                |
|---|----------------|
| North Shore—<br>Contracts 79 and 79A              | Casks<br>6,702 |
| Marrickville—<br>Contract 69                      | 6,729          |
| Total on these completed contracts                |                |
|   | 13,431         |
| Annandale and Leichhardt—<br>Contracts 77 and 118 | 7,719          |
| Waverley (in 1892)                                | 250            |
| Sundry  | 172            |
|   | 422            |
|   | 21,572         |

The contractors have, out of the above quantities, sold cement to other firms and to the Government, the total quantities of which have not yet been fully ascertained and deducted.

GEO. CHRISTIE,  
F.S.A.A.

Sydney, 8th July, 1896.

## PURCHASES OF CEMENT

(d) Carter & Co. and Carter, Gummow, & Co., from 1st January, 1892, to 30th June, 1896.

| Vendors               | Total  | Delivered to—          |                       |                                    |                   | Sundry |
|-----------------------|--------|------------------------|-----------------------|------------------------------------|-------------------|--------|
|                       |        | North Shore Contracts. | Marrickville Contract | Annandale and Leichhardt Contracts | Waverley Contract |        |
| Parbury, Henty, & Co. | 17,970 | 4,300                  | 6,729                 | 6,519                              | 250               | 172    |
| Henry Austin          | 1,402  | 1,402                  | .                     | .                                  | .                 | .      |
| Burns, Philp, & Co.   | 1,000  | 1,000                  | .                     | .                                  | .                 | .      |
| John Try              | 1,200  | .                      | .                     | 1,200                              | .                 | .      |
| Casks                 | 21,572 | 6,702                  | 6,729                 | 7,719                              | 250               | 172    |

Compiled by  
GEO. CHRISTIE, F.S.A.A.

Sydney, 8th July, 1896.

MEMO.—Messrs. Carter & Co.'s sales to other contractors and to the Government, &c., have not yet been deducted from these totals.

7760. *Mr. Parkes.*] Have you checked the sales of cement with the bank pass-books of Messrs. Carter, Gummow, & Co. and Carter & Co. to see whether the amounts are correct? Yes.

7761. You find that they tally? Yes.

7762. Is there any statement you would like to make to His Honor founded upon your perusal of the accounts in connection with these cement transactions? I may say that a further investigation has been proceeding in connection with the advances on the cement on these various contracts which have been made by the Government.

7763. These advances are made under an agreement for a bill of sale, I believe? Yes.

7764.

7764. The information you are prepared to give deals with Contracts 79, 79A, and 69? I have dealt with only two Contracts 79 and 79A in this connection. I have prepared a written statement which, since it deals with figures, I will read:—

G. Christie.  
8 July, 1896.

## MEMO. No. 2.

AS TO ADVANCES ON CEMENT MADE TO MESSRS. CARTER & CO. ON CONTRACTS No. 79 AND 79A.

(a) *Department's Rule as to Advances.*—See printed papers, No. 8, page 360, viz., 75 per cent. of value up to 75 per cent. of contract deposit.

(b) *Contract No. 79.*—Contract deposit, £2,000, on which 75 per cent. would be £1,500. Advances throughout at 16s. per cask, and 100 per cent. of same.

900 casks in certificates Nos. 13 to 15—

|   | casks. |
|---|--------|
| 21 September, 1892—Parbury, Henty, & Co.... | 699    |
| 24 „ 1892— „ „ „ .....                      | 200    |

899, at 11/8, carted to N.S.

1,700 casks in certificate No. 16—

The above and

|  |   |
|--|---|
| 30 June, 1893—Parbury, Henty, & Co. .... | 500, at 10/3, delivered at N.S. by lighter. |
| 15 July, 1893—Henry Austin .....         | 400, at 9/9, in lighter.                    |

1,799. Only a little work requiring cement had been done.

2,700 casks in certificate No. 17—

The above and

|  |                            |
|--|----------------------------|
| 14 July, 1893—Burns, Philp, & Co. .... | 1,000, at 9/9, in lighter. |
| 20 „ 1893—Henry Austin .....           | 1,002, at 9/9, „           |

Delivery to July, 1893.....3,801 casks.

*Memo.*—Deliveries from Henry Austin and Burns, Philp, & Co. were on sales made June, 1893.

(c) *Contract No. 79a.*—Contract deposit, £485. The amount advanced exceeds 75 per cent of deposit £485 (namely, £360), in the following certificates:—No. 2, £375; No. 7, £656; No. 8, £656; No. 9, £656; No. 10, £656; No. 11, £539; and in all cases the advance is at 100 per cent. of the value, 9s. 4½d. per cask.

*Memo.*—There are on certificates certain advances under the heading of material, viz., No. 11, £718; No. 12, £500; No. 13, £165.

(d) From the foregoing it would appear that in Contract No. 79, the amount advanced in certificate No. 17, on 2,700 casks of cement—namely, £2,160—was £660 in excess of the Department's limit. It will further be seen that there was not the security for this £2,160, as the cement, at even an average price of 11s. 6d. per cask in the contractors' store, the value would only be £1,552 10s. The cement was thus over-valued to the amount of £607 10s.

(e) And, as regards Contract No. 79a, the amount advanced exceeded the Department's limit in certificates No. 2, 7, 8, 9, 10, 11, in the amount of £15, £296, £296, £296, £296, and £179 respectively.

Sydney, 8/7/96.

GEO. CHRISTIE, F.S.A.A.

7765. *Mr. Parkes.*] The cement upon which an advance is made of 16s. was really bought at a total cost of about 11s. 2d.? Yes. You will see that 900 casks were purchased at 11s. 8d., actually delivered at North Sydney when cement was slightly higher than the price at which it subsequently stood. Later on, cement was bought at 9s. 9d., delivered in lighter. You will see from the report that cement was bought at lower prices subsequently, but with less expensive delivery. But taking the average, 11s. 6d. would be the price throughout, delivered at the contractors' depot.

7766. With reference to Mr. W. A. Smith, who was an engineer in the Department, and his two cheques to Carter, Gummow, & Co., his cheque of £20 5s. was paid in on 8th February, 1895? Yes.

7767. It was Mr. Smith's official cheque to Carter & Co. for certain cement supplied for a culvert on the Parramatta Road, at Burwood or Strathfield? Yes.

George M'Credie recalled and further examined:—

7768. *Mr. Parkes.*] You are a member of the firm of M'Credie Bros., consulting engineers? Yes.

7769. You have made an investigation as to the total number of casks of cement paid for under the vouchers in respect of Contracts 79, 79A, and 69, have you not? Yes. (*Vide Appendix No. 15.*)

7770. You have made a similar investigation in respect of Contracts 72, 118, and 77? Yes.

7771. Will you tell us the total number of casks in connection with these contracts? Yes.

7772. What are the totals? On Contract 69, 11,134 casks; upon Contract 72, 12,008 casks; upon contract 77, 3,464 casks; upon Contract 79, 6,677 casks; upon Contract 79A, 3,323 casks; upon the High-street branch of 79A, 477 casks; upon 118, 8,144 casks; making a total of 45,227 casks of cement used on the contracts. That is, according to the quantities given in the final returns or the last progress returns of the respective contracts.

7773. Taking contracts 79, 79A, and 69, will you tell His Honor what quantity of cement is included in the vouchers upon which payments were made by the Government, including the High-street branch of 79A? 21,611 casks.

7774. Your calculation is based upon tests made to see how much cement would be consumed, and upon your knowledge of contracts generally? It is.

7775. How did you make the tests? We mixed the stuff dry and wet to see how much would be used, and we worked it out per yard.

7776. You used the same proportions as are contained in the Government specification—that is, you took a yard of brickwork at so much, the piping at so much, and the concrete at so much, making tests in each case? Yes.

7777. And your calculations on that basis come out at 21,611 casks for the three contracts I have named? Yes.

7778. If it had been proved that the purchases of cement for those contracts were only 13,431 barrels that would leave 8,180 barrels to be accounted for, would it not? Yes.

7779. You have proved your tests and figures over and over again, have you not? Yes; any that I had a doubt about. I have had a yard of brickwork laid, and others did so, so that I should be satisfied.

7780. And the same with the rendering to find out how many yards would be covered, and the same with the piping? Yes.

7781.

G. M'Credie.  
8 July, 1896.

- G. M'Creddie. 7781. Could you go 100 casks wrong in that calculation of yours? I do not think so. I am perfectly satisfied with these quantities.
- 8 July, 1896. 7782. If you look at page 318 of the Parliamentary papers in connection with Contract 79, you will see a letter from Mr. Davis advising that, as the contract contains such a large amount of heavy excavation, if the contractors make up solid with concrete all the original quantity blown out, they shall be paid on an average of  $3\frac{1}{4}$  inches thick. That was agreed to in a letter of August 21st, and accepted by Mr. Carter. The intent of such a letter would be that an average of  $3\frac{1}{4}$  inches would not contain the whole of the concrete which they would have to put in, would it not? I should take it to be so. I understand that to be the average upon which they would be paid upon the condition that they filled in all the vacant places they have excavated.
7783. It is possible then that from the method of taking out the rock there would be a considerable addition to the number of barrels of cement which you have taken into your account? There would probably be considerably more according to that letter, assuming that they had to fill up every vacancy caused by the excavation.
7784. The quantities you have taken out are based only upon the  $3\frac{1}{4}$ -inch margin? Yes.
7785. Therefore you must be within the limit? Yes; I consider that I am well within the limit under those circumstances.
7786. I believe that according to your return sixty casks were used for every hundred paid for? Yes.
7787. In sewerage work, owing to the escape of gas and the work being underground and covered in, the most careful work ought to be done? Yes.
7788. If there is an insufficient quantity of cement put into the material used, it would be defective work? Yes.
7789. In addition to the loss of money upon the scant supply of cement a greater cost has to be taken into consideration for the defective work itself? I should think so—in fact I am sure of it.
7790. Have you any doubt in your mind at all but that this cement has not been supplied? I could not say that.
7791. Have you any doubt at all as to your figures? I am perfectly satisfied that my figures are correct.
7792. You have taken them from the departmental vouchers? I have not only taken them out myself, but my partner has gone through them all, and has checked them.
7793. They have been taken from the departmental vouchers upon which the contractors have been paid? Yes.
7794. *Mr. Davis.*] You examined several weeks ago some of the brickwork upon Contract 79? Yes.
7795. What impression did you derive as to the nature of the compo. from what you then saw? My idea was that it was very good.
7796. There was nothing to indicate that there was any shortage of cement in it? I could not say from the surface. It looked all right on the surface.
7797. You stood by when the bricks were being knocked out? Yes. I was perfectly satisfied.
7798. You thought it good work? Yes.
7799. There was nothing to indicate that there was any shortage of cement? No. You will perhaps remember that I said so when I gave my evidence before.
7800. You had an opportunity to see the rendering upon the whole of the sewer and in the shafts in the case of Contract 79? Yes.
7801. As a man of considerable experience will you say whether there was anything in what you saw to denote a shortage of cement? No. There was nothing there to indicate a shortage of cement.
7802. If you had had the supervision of these contracts and had been making your final inspection would you have come to the conclusion that all the cement specified had been put into the compo.? Yes.
7803. It looked all right? I could not come to any other conclusion from looking at it.
7804. Now with regard to the bluestone concrete, how did you arrive at the quantity of cement in a cubic yard of bluestone concrete; what proportions are specified in the case of Contract 69? 4, 2, and 1. The cement and sand disappear in the metal. I found that there was 1·6875 casks of cement in a yard of concrete.
7805. Have you had any very extensive experience in the use of those proportions in concrete? Yes; I have had a good deal of experience in 4, 2, and 1, and 5, 2, and 1.
7806. I want you to speak from your general experience, and not from a single experiment. Taking 16 cubic feet of stone, 8 feet of sand, and a cask of cement, do you say that that would make only 16 cubic feet of bluestone concrete? Yes.
7807. You are quite positive about that? Yes.
7808. Are you speaking now from the experiments you have made? From experiments I have made from time to time in connection with that class of work.
7809. What gauge of stone did you use in this particular experiment? I could not tell you the gauge of the stone.
7810. Do you not think that the gauge of the stone has a great deal to do with it? I am speaking now of my experiments on different jobs. If you are referring to the experiment as regards this particular class of stuff, I think the gauge of the metal was  $1\frac{1}{2}$  inches.
7811. What was the size of the gauge-box which you used for your experiment? It was an ordinary sized gauge.
7812. But I want to know what size? The ordinary size for mixing up a yard of metal.
7813. How much would it contain? A yard of stuff.
7814. A yard of bluestone? Yes.
7815. What quantity of sand did you put to that? Two of sand and one of cement.
7816. How much sand did you put to 27 cubic feet of bluestone? I have not the particulars here.
7817. I should have thought that seeing you were so positive in what you said, that you had the particulars with you? I can easily obtain them.
7818. I want to know what quantity of sand you put to the 27 cubic feet of  $1\frac{1}{2}$ -inch blue-stone metal? We mixed in the proportions of 4, 2, and 1.
7819. But you do not know the quantities you put in? I have given you the proportions.
7820. But you cannot answer my question as to the quantities? Not without reference to the exact particulars.



7821. So that as a matter of fact you are not sure about even your experiment? I am perfectly satisfied G. M'Creddie.  
as to the figures I have given. All the data are in my office, and I can give you all the information you  
want when I have the particulars in front of me. 8 July, 1896.

7822. Coming now to the sandstone concrete—what proportion of sandstone did you use to the sand and cement? The proportions were 5 of sandstone, 2 of sand, and 1 of cement.

7823. Did you make an experiment with those proportions? Yes.

7824. What was the gauge of the stone in that case? It is difficult to say from memory, but I can give you all the particulars later on.

7825. I should prefer to have the particulars now—it is a very important matter? The proportions were taken in each case from the specification, and you cannot expect me to carry in my head the specifications of five or six different contracts.

7826. Can you say whether the stone specified for the sandstone concrete is of a different gauge in the three contracts—79, 79A, and 69? I cannot tell you that unless I go into the quantities. You have all these contracts at your fingers' ends, but you cannot expect me to remember every item.

7827. What does a cubic yard of stone make in the case of the sandstone concrete? A cubic yard. If you mean the cement used, there would be 1.35 casks to the yard.

7828. How much would 27 cubic feet of sandstone make in concrete? A yard.

7829. No more? No.

7830. You know that from experiments? Yes.

7831. Have you used it in your work in the proportion of 5, 2, and 1? Yes.

7832. You know from your experience, then, as well as from the experiment you are supposed to have made, that 27 cubic feet of sandstone will make 27 cubic feet of concrete? I think you must misunderstand me. What I mean to say is that I made an experiment only in regard to certain things. As regards other matters, I take them from my practical experience in the past. I made experiments in the laying of brickwork of the same kind that would be found in your sewer.

7833. You have not experimented, then, as regards the sandstone concrete? No. As regards those two things, I am speaking from my practical knowledge.

7834. You have made no experiments with these particular mixtures? No; the experiments I made were in the laying of the brickwork and in the rendering.

7835. So that your calculations are based not upon experiments with these mixtures, but upon your idea as to what one cask of cement would make? I have made experiments in regard to the two things I just mentioned. The other matters are based on a practical experience extending over the past fifteen or sixteen years.

7836. Taking the brickwork experiment which you have made, what joints did you allow? Ordinary joints.

7837. What joints are specified? Now you are referring me to the specifications again.

7838. If you made the experiment you should know what the joints were;—you are supposed to make the experiment on the basis of the specification? The experiments were on the basis of the specification.

7839. What instructions did you give the men who put up the yard of brickwork? I could not tell you unless I looked at the details. I see that the cement ran out at .5 per yard.

7840. You say that the figures showing the total number of casks are taken from the vouchers in Contracts 69, 79, and 79A, including the High-street branch? Yes.

7841. I suppose you can give us particulars showing how you arrive at the total in the case of each contract? They are all in the return which I have handed in.

7842. *Mr. Gummow.*] You said that you were sure that your calculations were correct to within 100 casks? Yes.

7843. Can you tell me how much two-ring brickwork is included in the total of the brickwork of these three contracts, and also how much one-ring work is in them? No, I could not.

7844. Could you tell me whether it takes the same proportion of cement for two-ring work as for one-ring work? There is a joint extra as between two-ring and one-ring, of course.

7845. Would it make some difference? Yes, it would make a difference, but it can easily be calculated.

7846. Would it make a difference of 100 casks? I could not say unless I calculated it.

7847. Then you do not know whether your calculation is correct to within 100 casks? I am satisfied I am correct in the figures I have put down.

7848. Do you know whether the work is all two-ring or one-ring? No.

7849. Yet you say your calculation is correct? Yes, upon the Government vouchers.

7850. Do the Government vouchers specify the two-ring and one-ring work? No.

7851. Then how can you make the statement that your calculations are correct to within 100 casks if you have not the full particulars? But I had the full particulars. I got them from the vouchers.

7852. You had certain particulars to work upon, and from those you argue that your figures are correct? They are right if I had the correct particulars. Of course, if I had not the correct particulars an alteration would require to be made.

7853. You do not know for certain that you had the whole of the particulars? No.

7854. You do not know exactly how much two-ring work and how much one-ring work there was? No.

7855. And you consider that there would be a difference in the two cases? Certainly, in two-ring work as against one-ring work.

7856. And yet you said you would stake your professional reputation upon the figures being correct? Yes; I am perfectly satisfied that they are correct.

7857. As to the bluestone concrete, you say that the proportions in the specification are 4, 2, and 1? Yes.

7858. And you say that all the sand and cement is lost in the interstices of the stone? Yes, that has been my experience.

7859. Would you stake your professional reputation on that statement? Yes, on the statement that that is my experience.

7860. And the same with regard to sandstone concrete? Yes.

7861. *Mr. Parkes.*] It did not much matter to you what the nature of the work was—you took the vouchers upon which the contractors were paid? Yes.

7862. As a matter of fact, if the work happened to be two-ring brickwork that would increase the number of barrels of cement? Yes.

- G. M'Credie. 7863. In the laying of all sorts of brickwork, and particularly in tunnels, there is a tremendous amount of waste? Yes.
- 8 July, 1896. 7864. That is all thrown in in your calculation? Yes.
7865. In making up your calculations, you carefully perused the specification in every case? Yes.
7866. And every calculation you have made is according to specification? Yes.
7867. You could not remember the details in every case without going through the specification? No.
7868. Did your brother make out any calculations? I got him to check them.
7869. He went through them as well as you? Yes.
7870. Were they gone through by any one else in your office? Yes.
7871. Are there not standard works which guide engineers and other professional men in these proportions? Yes.
7872. What do they say upon these points? You will find that they pretty well agree with the figures I have put down.
7873. Did you look them up? Yes; I looked at Molesworth and Hurst.
7874. *His Honor.*] As to what? As to the quantities in a yard of brickwork, and as to the disappearance of the sand and cement. But I prefer taking practical tests against the standards. In this case, however, the standards and the practical tests came out pretty closely together.
7875. *Mr. Parkes.*] Do the standards give an absolute extinction of the sand and cement? They give the proportions according to the quantities that are mixed. The standard and the practical tests are about the same. In the case of the compo. we were talking about the other day, they are practically the same.
7876. What do the standard works say about concrete of 4, 2, and 1? I could not tell you just now; but the figures are about the same as those which you will find in the papers I have handed in.
7877. As to the proportion of cement in Contracts 79, 79A, and 79A, High-street Branch, for every hundred casks paid for sixty-four have been delivered? Yes.
7878. Then take Contract 69;—what is the number of casks given in that case? 11,134.
7879. And taking Mr. Christie's estimate of the quantity delivered to be correct—that is to say 6,729;—what would be the proportion? About sixty-two for every hundred paid for.
7880. Taking the contracts all through you think the average would be about sixty-two for every hundred paid for? Yes.

Thomas Robert Steel sworn and examined:—

- T. R. Steel. 7881. *Mr. Parkes.*] You are accountant in the Department of Public Works? Yes.
- 8 July, 1896. 7882. Is it not usual to keep all records of authority for the payment of moneys upon certain public works, and also all the vouchers in connection with such payments? I have no knowledge of records. I am the accountant of the Department. I believe that the ordinary practice is to keep records. It is our custom to keep accounts.
7883. But as to other papers, such as authorities for the work, and that sort of thing? That is a matter which comes within the province of the chief clerk.
7884. You have all the vouchers? Yes.
7885. Have you every voucher in connection with the culvert at Strathfield? It is impossible to say. I could not identify them unless the name of the culvert were specifically stated upon the face of the voucher.
7886. Suppose authority were given for the expenditure of £200 upon one work, and £1,000 upon another work, and £500 on a third, would not the accounts in connection with those works be kept separately? The expenditure of money in connection with the Monier culvert, for instance, would not be kept distinctly from the expenditure upon the Main Western Road.
7887. Is it not the rule of the office to keep all expenditures of money upon particular works within the authority given? I know nothing about the authority to expend.
7888. But is it not the practice to keep each public work separately in your account books? Yes.
7889. Do you ever indulge in the practice of taking a sum of money from a Vote for one public work for expenditure upon another without authority? Not without the authority of the Minister, and frequently that of the Executive Council.
7890. But it is done sometimes? Yes.
7891. Has it ever been done without the authority of the Minister? Not to my knowledge.
7892. Therefore all payments for the Strathfield culvert should be in one account? Together with those for the Main Western Road.
7893. A culvert was recently built at Ashfield;—would you not keep the expenditure in connection with that culvert separate from the general expenditure upon the Main Western Road? No.
7894. It would go into the Main Western Road expenditure? Yes.
7895. You would not keep the accounts in connection with each work separately? No.
7896. *His Honor.*] Then you could not tell whether the expenditure has gone into a culvert at Ashfield or into a culvert at Gongolgin? Not if it were done by day work. The vouchers would show the wages of the men for the month. They would not show the distribution of the expenditure upon works on the line of road.
7897. That is, whether a man were working one day at Strathfield, the next day at Ashfield, and another day at Parramatta, and so on? Quite so.
7898. Is that the way in which the accounts are kept? The wages are made out for the month in the case of the regular maintenance men, and frequently for a fortnight in the case of men at work on special jobs. The vouchers would not always distinguish the particular works upon which the men had been engaged. They would show that the men were engaged upon one particular line of road, but they would not show the specific work upon which they had been employed.
7899. *Mr. Parkes.*] Supposing the officer at Parramatta were asked for the expenditure in connection with some particular work upon the Main Western Road from Sydney to Dubbo—say the cost of a bridge—how would he arrive at the expenditure? He would communicate with the local officer.
7900. How would he make up the expenditure? There would be the record of the men who were working each day on different works.

7901. Who would be the officer to whom to apply for such information in the case of the Strathfield culvert? Mr. James Symonds, sen. I know that from seeing that he signed vouchers marked "Monier culvert."
7902. *Mr. Smith.*] I believe you received an order signed by Mr. Davis for the production of certain papers in connection with this culvert at Strathfield? Yes.
7903. And you have produced all the papers you have in connection with that culvert? Yes.
7904. They are all here to be seen by any one who wishes to see them? Yes.
7905. The papers, I suppose, would include all the vouchers relating to the Main Western Road about that time? No. The Main Western Road under Mr. Symonds would extend from Sydney to a point somewhere beyond Emu Plains.
7906. Have you all the vouchers in connection with the expenditure upon that piece of road? We can obtain them all if they are wanted.
7907. But you have obtained all those relating to this particular culvert? All those which Mr. W. A. Smith picked out and identified as relating to that culvert.
7908. Has Mr. Bryant, who was examined the other day, asked for any vouchers beyond those already produced in connection with that culvert? Not to my knowledge.
7909. *His Honor.*] Your knowledge would relate exclusively to the accounts? That is all.
7910. Have you given to Mr. W. A. Smith, for his information, all the particulars which you can give from the accounts over which you have control? Every information.
7911. You cannot give Mr. Bryant any further information? Nothing further that I am aware of, but anything which he may ask for I will endeavour to obtain and put in his possession.

T. R. Steel.  
8 July, 1896.

William Thompson sworn and examined:—

7912. *Mr. Parkes.*] You have made out a calculation, taken from the Government vouchers, showing the number of casks of cement necessary for the execution of the various items paid for by voucher in connection with Contracts 69, 72, 77, 79, 79A, the High-street branch of 79A, and No. 118? Yes.
7913. What do you make the total quantity of cement necessary for these contracts to date of last certificate? 45,354 casks. [*Vide Appendix No. 17.*]
7914. What was the total number of casks of cement necessary for the cement-work paid for according to the vouchers upon Contracts 69, 79A, and the High-street branch of 79A? 21,637.
7915. You have made up your calculation from standards showing how the materials combine together and the quantities they make? Yes. From standard and practical experience in taking out the concrete in contracts for the last ten or twelve years, I have allowed the cement and sand to disappear bodily.
7916. Do you feel certain about your calculations to within 100 casks? Yes.
7917. Did you make any calculation for waste in material? No.
7918. You have looked over the Parliamentary papers? Yes.
7919. You have noticed a letter in the papers referring to how the concrete is to be paid for in connection with the margin round the sewer? Yes. I noticed in one case that some particular thickness was to be allowed for.
7920. Was it a proportion? I forget exactly.
7921. Was it given as compensation for the substitution of blasting for guttering and gadding? Yes.
7922. To make up the difference? Yes.
7923. Therefore the quantity you have estimated is likely to be less than was actually required, is it not? Yes.
7924. So that your calculations, if you take into consideration the filling in of the cavities, would have to be greater, if anything? Yes. My calculations are founded upon the quantity of cement-work actually paid for.
7925. Have you at odd times had to make up contractors' estimates for concrete? Yes.
7926. What has been your practice in these cases in estimating the proportions of stone, sand, and cement? If the stone is of a coarse description at all, the sand and cement will disappear bodily. They will just fill up the interstices.
7927. Have you made any tests from the specification? I have seen tests made by contractors.
7928. But you have made your computations from the nature of the material specified? Yes.
7929. You have read the specifications in the case of these contracts? Yes.
7930. Have you taken any cognisance of an agreement for a bill of sale in respect of the contractors' cement;—have you noticed that the percentage paid under this agreement is not on the material actually fixed in the work, but on the material in the contractors' stores? No, I did not go into that.
7931. Do you know of any case in private business where money would be advanced upon material under such circumstances? Not unless it were actually in the work. In private practice it is never done, of course.
7932. Advances are made only upon the fixed work? Yes.
7933. Do you know of any case in which payments have been made otherwise? I never heard of such a case in private practice.
7934. There is no doubt in your mind but that the quantities you have given are well within the mark? I think there could be no doubt as to that.
7935. Supposing the waste were accounted for, what do you think it would make—taking the cement used in the tunnel work? I could not speak as to the extent of the tunnel work.
7936. What would the waste amount to in ordinary plastering,  $\frac{5}{8}$ -inch thick? There would be very little waste.
7937. What about the plastering of the soffit of an arch or of a tunnel;—what would the waste be in that case? There would be a certain amount of dropping, but it would not be very large.
7938. Is it a difficult thing to plaster a circular soffit? Yes.
7939. Is there not a great deal of waste in plastering a circular soffit? There is a fair amount of waste in that case.
7940. Therefore your calculations as regards the fixed material allow for a very fair margin? Yes.
7941. *Mr. Davis.*] You say that when coarse stone is used for concrete the whole of the sand and cement which are used disappear? Yes.

W.  
Thompson.  
July, 1896.

- W. Thompson.  
8 July, 1896.
7942. And in making your calculation in respect of Contracts 69, 79, and 79A you went upon that assumption? Yes.
7943. You went upon the assumption that the stone would be coarse? Two-inch or 1½-inch stone, as the case might be, and as specified.
7944. Did you go upon the assumption that the stone would be so coarse that the whole of the sand and cement would disappear? At that gauge.
7945. What gauge? Two-inch metal in one case, and 1½-inch in the other. I referred to the specifications.
7946. *Mr. Gummow.*] You said you had obtained some information from what you had seen in connection with certain contracts? Yes; my information is obtained from experience spread over the last ten or twelve years.
7947. I mean information regarding gauging according to the specification? Yes.
7948. Where did you see the gauging specified in the case of these contracts mixed? I have seen the same stuff used in the case of private buildings repeatedly. I have seen and used the same size of metal and the same gauging frequently. It is pretty well a stock concrete.
7949. Do you know if any other contractors with the Sewerage Department obtain advances on cement? No. I have had very little to do with the Sewerage Department.
7950. *Mr. Parkes.*] In reading through the papers did you notice this memorandum:—

In consideration of the Minister for Public Works, in and for the Colony of New South Wales, advancing to us the sum of £1,000, and of any future advances to be made to us, we hereby agree to repay to the said Minister for Public Works the said sum of £1,000, and future advances, together with interest at the rate of £6 per centum per annum on such sums respectively from the date of advance, on demand, and we hereby charge all moneys due or payable, or becoming due or payable, to us under a certain contract for the construction of the Eastern Main Branch Sewer, Western Suburbs Drainage, Contract No. 69, Sydney Sewerage Works, in the said Colony, entered into by us with the Government of the said Colony; also all cement, building materials, and every other thing already used, or to be used, in connection with our said contract, with the repayment of the said sum of £1,000, and any future advances, and interest at the rate aforesaid; and we hereby undertake to give, whenever called upon to do so, a valid bill of sale to the said Minister for Public Works over the said cement, building materials, and every other thing used in connection with our said contract, now stored in our premises at Illawarra Road, Marrickville, in the said Colony, or elsewhere; such bill of sale to contain a power of sale, and such other powers, provisos, and agreements, as the said Minister for Public Works may be advised. We also further undertake to give immediate possession of same to the said Minister, or any person appointed by him for that purpose, whenever called upon to do so.

? Yes.

7951. *Mr. Smith.*] Do you say you never heard of private individuals lending money under similar securities to those named in the document you have just heard read? Not as proprietors in the case of contracts in progress, though, of course, an individual might take a lien over such security.
7952. *Mr. Parkes.*] They would be in trouble if the contractors went insolvent, would they not? Yes; if the material were liable to be removed, of course.

Harold Francis Norrie recalled and further examined:—

- H. F. Norrie.  
8 July, 1896.
7953. *Mr. Parkes.*] When the document was drawn up, allowing of an advance being made on a bill of sale to the contractors in respect of their unfixed material, was it submitted to the Minister for approval? I do not know.
7954. Did you submit it? No.
7955. Who instructed you to draw up such a document? I cannot trace the papers upon which I got my instructions, but that I had instructions to draw it up I am satisfied. I should not do it without instructions.
7956. Did you get Ministerial approval? I do not recollect having had it.
7957. Do you know whether the head of the Department ever got Ministerial approval of the document? I do not know.
7958. Take the cases of Contracts 69, 79, and 79A, the same thing occurred in connection with every one of them;—does your reply to my question refer to the whole of those contracts? No; I think the papers show that I had instructions through the Sewerage Department in the other cases.
7959. Had you Ministerial authority in those cases? I do not recollect it.
7960. *Mr. Smith.*] You know that it has been the custom in the Department to make these advances? I know it as a matter of practice.
7961. *His Honor.*] For how long? When I came to the Department from the Crown Solicitor's office I found that these advances were being made, and that no document of any kind was taken. I then prepared the form of undertaking which Mr. Parkes read to the last witness, and I submitted it, to the best of my recollection, to the then Crown Solicitor for his perusal. It had been the practice, I found, to make the advances before I came down to the Department.
7962. *Mr. Smith.*] And the form generally used in these cases was, you think, submitted to the Crown Solicitor? Yes; I thought it would be very much better to do so.
7963. From the fact of your having drawn this form for this particular contract, No. 69, you feel confident that you must have had the usual instructions to prepare it? I am quite satisfied that I had.
7964. You did not draw it on your own motion;—you must have had the usual instructions? Yes.
7965. I think in the new general conditions reference is made to the possibility of advances of this kind being made? Yes; I think in clause 34.
7966. *Mr. Gummow.*] When you came from the Crown Solicitor's Department to the Works Department you say you found that advances were being made without any documentary evidence or bill of sale? So I was given to understand.
7967. Do you know whether Carter, Gummow, & Co. ever received any advance without signing a bill of sale or a memorandum of this sort? I do not, of my own knowledge.
7968. Do you know whether Carter, Gummow, & Co. were the first persons who received this advance upon material? I understood when I came down from the Crown Solicitor's Department that contractors had been receiving such advances occasionally.
7969. Do you know whether we were the first firm which received this particular concession? I do not know, but I do not think so.

7970. Supposing a firm, after you advanced £1,000 or £2,000 upon a large contract, went insolvent, would you have any redress upon the strength of your memorandum? I should put it in as proof of debt.
7971. But would you have any security at all? We have the cash deposit, and we have also the retention money. There is 10 or 20 per cent. retention money. More than that, I understand that the advance upon cement was made only at the rate of 75 per cent. upon the then existing market value.
7972. *Mr. Parkes.*] Is this advance on all material or only on cement? I take it that it covers any other material.
7973. You think it would apply to any material as well as cement? Yes.
7974. Is it a fact that this advance has been made upon cement only to the extent of 75 per cent. of its market value? That I do not know. As regards that matter, I am speaking from hearsay. I have had nothing to do with the advances.
7975. Do you not know from the vouchers that advances were made to the extent of 100 per cent.? I never looked at the vouchers. Therefore I do not know about that?
7976. You cannot be sure that the condition as to the advance to the extent of only 75 per cent. is being carried out? No.
7977. You cannot be sure either that the advance is made on the market price? No.
7978. *Mr. Smith.*] You drew up a security for a particular sum according to your instructions? Yes.
7979. How that sum was arrived at you do not know? No; and I did not wish to know.

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James Symonds having made an affirmation was examined:—

7980. *Mr. Parkes.*] You were in the Public Works Department at one time? Yes.
7981. When did you leave? I was retrenched on June 30th of last year.
7982. At the time of your leaving what was your position? I was Road Superintendent for the Parramatta District.
7983. Do you recollect a culvert being built at Strathfield upon what is called the Monier system? Yes.
7984. Did anything happen to that culvert? Nothing special, that I am aware of.
7985. Did you exercise close supervision over its construction? I had a general oversight of it. There was a foreman on the ground appointed by Mr. Smith. I paid the men.
7986. You did not see the construction of the work then? I visited it on two or three days in each week.
7987. Do you know what the work cost? I have never reckoned it up closely, but I could tell you if I had access to the voucher book.
7988. *His Honor.*] Do you know anything about the cost? I know that the money authorised was not half sufficient.
7989. *Mr. Parkes.*] What was the amount authorised? £110.
7990. You paid the vouchers for the work? Yes.
7991. Did the cost exceed £200? I think the cost was between £230 and £250, but I would not be certain of the exact amount.
7992. If you saw the books you could pick out the items? Yes.
7993. Did you ever hear of anything happening to the culvert? Not that I am aware of. I had very great doubt in my mind as to whether it would be strong enough, but on seeing the principle worked I felt fairly satisfied that it would stand.
7994. Do you know if any iron bars or cambered plates or anything of that description were afterwards put in to sustain the work? Not to my knowledge.
7995. Was anything of that kind put in while the work was going on? Not to my knowledge.
7996. Did you see the whole of the construction? I was there twice-a-week.
7997. Those would be casual visits? Yes, on my ordinary rounds. I might have had a dozen other matters to see to at that time.
7998. Do you know how the accounts of the road expenditure were kept—if, for instance, there were a culvert to be constructed at Strathfield and a bridge at Parramatta, would the accounts of those two works be kept distinctly? They are supposed to be kept distinctly.
7999. Did you yourself keep them distinctly? As far as I was able.
8000. What vouchers did you send on to the Department in connection with this culvert? I could not say without referring back to my books.
8001. What was your book called? Well, there would be the record book.
8002. If that book were produced could you pick out all the papers relating to this culvert? Yes.
8003. Do you know where the money was taken from to make up the necessary amount? It was paid out of the main Western Road vote.
8004. You know for certain that the money authorised for the work was insufficient? Yes.
8005. When did it run out, do you know? As nearly as I can remember when the work was half completed.
8006. What was the sum total allowed for the work? I think £110.
8007. Might it not be £123? No, I think that was in connection with another culvert at Ashfield.
8008. When you were making up your estimate, did you put in 15 per cent. for royalty to Carter, Gummow, & Co.? I did not make out an estimate in connection with the first Monier culvert, but I made out an estimate afterwards for the second culvert at Ormond-street, and I think 15 per cent. royalty was allowed.
8009. Who instructed you to do that? Mr. W. A. Smith told me that 15 per cent. royalty was to go in in that case, but the culvert was never constructed, I think.
8010. *His Honor.*] You are referring now to the culvert which it was intended to construct at the corner of Ormond-street? Yes.
8011. What was the exact position of the first culvert—the one which was constructed? We called it the Burwood culvert. It was at the foot of the Wentworth road.
8012. *Mr. Parkes.*] Is it near Dawson's property? That I cannot say.
8013. Did it cost more than an ordinary 9-in. brick culvert would have cost? Yes; it cost much more. I made out an estimate for a 9-inch brick barrel culvert, and I think the amount came out to £110. There was an old brick barrel culvert there, and I thought that if a new culvert were constructed upon the same method it would be sufficient. The bricks of the old culvert were inferior.

J. Symonds  
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- J. Symonds. 8014. Did you send your estimate into the department? Yes.  
 8015. With a report? I believe so.  
 8 July, 1896. 8016. *Mr. Smith.*] I think you recommended that £300 should be put upon the estimates for this work? Never.  
 8017. I think you said you paid the men on the main western road, did you not? Yes.  
 8018. How far would the length of road under your control extend? From the Newtown Road to Springwood.  
 8019. You would pay all the men working on any part of that road? Yes.  
 8020. While this particular work was going on on the Parramatta Road at this culvert other works on the road were going on, I suppose? Yes.  
 8021. Upon which the same men employed upon the culvert were also engaged? No, not at all.  
 8022. Would they not be employed upon other jobs when they were not wanted at this culvert? They went on to another culvert when they had completed the Monier culvert.  
 8023. In the employment of day labour the men might be wanted upon one job on one day and they might be removed to another job on the next day? This culvert was not constructed by ordinary day labour. Mr. Smith specially engaged the men for this Monier culvert work.  
 8024. What sort of books did you keep;—were the men paid every week? Once a fortnight. I kept the ordinary set of books. We had a book relating to contracts, a book relating to cash; then there was the voucher book, in which the amounts and description of work would be noted. The system has been altered so many times that it is difficult to say under which system we were working at that particular time. We worked sometimes under one system and sometimes under another.  
 8025. But when you paid the men, what sort of receipt or statement was prepared? The ordinary voucher.  
 8026. There were several names on one voucher? Yes. The men on one special job would be put on to one voucher, the foreman being at the top and the other names following. The voucher would be signed by me. I took the signatures of the men and forwarded the receipts to the office.  
 8027. And all the vouchers that were used in connection with this job would refer to that job and that job only? The vouchers sent in in connection with that job would refer to that job only.  
 8028. *His Honor.*] Were they marked in such a way that they could be easily picked out from the rest? Yes. To the best of my recollection I wrote on all of them "Burwood Monier culvert."  
 8029. Were you anxious to keep the accounts in connection with the culvert separately? I endeavoured in my vouchers to make them as explicit as possible, so that on reference to them anyone would be able to see at once the work in connection with which they were prepared.  
 8030. Did your books show upon what work the money was expended—how much, for instance, a particular piece of work had cost? Yes, generally, because we put down the vote, and all the work done under that vote would be placed under that heading.  
 8031. What afterwards became of the vouchers? The receipted voucher would be sent to the Audit Office, and one copy would be kept in the Roads Office.  
 8032. What then are the books to which you wish to refer in order to make up these items? I want the books in which we put down the amounts of the vouchers.  
 8033. Are the vouchers bound up together? No; but all the vouchers sent in were entered in a book.  
 8034. What other books do you want? I do not know that I should want any other books.  
 8035. Then it is only this one book which you want to enable you to make up the cost of the work? Yes.  
 8036. Did you send all your books into the Department when you left? I left them with my successor.  
 8037. Your office was in Parramatta? Yes.  
 8038. Would not the books be there still? They ought to be there.  
 8039. Is there any reason that you know of for their being yet brought to Sydney? No.  
 8040. When had you the misfortune to be retrenched? On June 30th of last year.  
 8041. *Mr. Parkes.*] Are the books produced your books? Yes.  
 8042. *Mr. Gummow.*] You say you designed a circular brick culvert? Yes.  
 8043. What size was it? Two feet to the best of my recollection.  
 8044. *His Honor.*] Two feet diameter or 2 feet radius? Two feet diameter.  
 8045. *Mr. Gummow.*] Would it give the same waterway as the culvert which was put in? No.  
 8046. Can you then compare the two culverts? The culvert I recommended was sufficient for the purpose. The present culvert is about twice the size needed.  
 8047. Therefore, your superior officer made a mistake in putting it in? I do not know that he made any particular mistake, but he said he wished to try the Monier system. He said it would be cheaper, but I said it would not be.  
 8048. Had he any other reason do you suppose? I think it was a piece of folly to put in such a large culvert. There was not sufficient inlet to more than half fill it.  
 8049. What was the size of the old culvert? 1 ft. 6 in. or 2 ft., I forget which.  
 8050. *His Honor.*] Used it not to get choked occasionally? It had been choked, but that was on account of the outlet being choked. There is a good deal of bullock traffic on the road, and the bullocks had trampled the ground down over the outlet.  
 8051. Had that caused the road to overflow in heavy rains? I know that I had to put a man there several times to open it out. As I say, the bullocks had trodden the ground down.  
 8052. Almost every bit of alteration in the roadway, in the case of some suburbs, causes the rainfall, as a rule, to run off more quickly? Yes.

FRIDAY, 10 JULY, 1896.

Thomas William Bryant recalled, and further examined:—

- T. W. Bryant. 8053. *Mr. Parkes.*] Since you were last before the Commission you have perused the vouchers which have been submitted to you, and you have searched the books you used to keep when you were accountant for Mr. W. A. Smith, and you are prepared now to give further evidence with reference to the Monier culvert on the Parramatta Road at Strathfield, and also the work at Callan Park? Yes; I have looked through the vouchers, but unfortunately we have not had the papers in connection with the authorisation of the construction. We have made application to the Records Branch for them, but they say there are not

not any such papers in existence in reference to the culvert on the Parramatta Road. We have the papers, however, bearing upon the culvert at Ormond-street. There are many items which I think I could have traced, but which I have been unable to trace from the want of these papers. T. W. Bryant.  
10 July, 1896.

8054. What would be the total amount which you have been unable to trace? It would be very difficult to say.

8055. As to the vouchers or papers upon which you say the Department cannot put its hand, have you seen them before;—do you know of their existence? There are a number of vouchers, but without the original papers I cannot arrive at the amount, because some of the items of expenditure were drawn from other grants.

8056. What would the vouchers be for? For labour and for the carting of material.

8057. Before you read the statement you have made I will hand you a letter of Mr. W. A. Smith's, showing the estimated cost of a culvert of this kind? That document refers to a small culvert proposed at Ormond-street, on the Parramatta Road. They asked for £123 10s., and Mr. Hickson approved of the culvert being constructed. It was afterwards found that the money could not be spared from the main Western Road account, from which it was proposed to take the expenditure, and the matter, therefore, lapsed.

8058. Mr. Davis, in giving evidence the other day, stated that £100 was saved by the construction of the culvert at Strathfield upon the Monier system; is that correct? I know that the thing was the other way about.

8059. I presume you read Mr. Smith's evidence in the newspapers? Yes.

8060. You are aware he stated that the Monier culvert had cost £114, and that the departmental plan for a culvert in a similar position would involve an expenditure of £161? Yes.

8061. Was that statement correct? No.

8062. I hand you these vouchers, and I ask you whether you recognise them? Yes; they represent the actual payments in connection with the work.

8063. You have perused them? Yes.

8064. Are you sure these vouchers passed through your hands during the time that you were accountant to Mr. Smith? Yes.

8065. They are all vouchers in connection with the Monier culvert at Strathfield? Yes.

8066. That would be the culvert referred to by Mr. Smith in his evidence the other day? Yes.

8067. His evidence could not have referred to any other culvert? No.

8068. Will you read the details of expenditure which you have taken out of these vouchers, and afterwards give us the total? The amounts are as follows:—

Cost of Monier Culvert at Burwood, Main West Road (as per Parramatta Voucher Register).

| Voucher. |                                     | £  | s. | d. | Voucher. |  | £    | s. | d. |
|----------|-------------------------------------|----|----|----|----------|--|------|----|----|
| 189-94.  | P. Brady—wages .....                | 0  | 15 | 0  | 363-94.  | Ahern and Others—wages .....             | 17   | 4  | 1  |
| 190-94.  | M. Ahern—wages .....                | 10 | 2  | 6  | 368-94.  | Bailey—stone .....                       | 6    | 3  | 0  |
| 201-94.  | Keep & Son—bolts, &c. ....          | 0  | 10 | 5  | 373-94.  | Federal Timber Co. ....                  | 0    | 1  | 0  |
| 202-94.  | Brown and Brown—iron .....          | 0  | 15 | 4  | 375-94.  | Potts and Paul—wire .....                | 0    | 2  | 4  |
| 224-94.  | Ahern and Others—wages .....        | 22 | 10 | 1  | 388-94.  | Water Board—water .....                  | 0    | 2  | 9  |
| 234-94.  | Emu Metal Co.—gravel, &c. ....      | 6  | 6  | 3  | 389-94.  | Cullen Bullen Co.—cement .....           | 16   | 4  | 0  |
| 236-94.  | New Zealand Timber Co.—timber ..... | 1  | 1  | 6  | 390-94.  | McEwen & Co. ....                        | 0    | 9  | 7  |
| 237-94.  | Cullen Bullen Co.—cement .....      | 20 | 5  | 0  | 406-94.  | Brown and Brown—iron .....               | 0    | 3  | 0  |
| 238-94.  | Keep & Son—tools .....              | 0  | 6  | 8  | 414-94.  | Ahern and Others—wages .....             | 23   | 0  | 11 |
| 239-94.  | " .....                             | 0  | 2  | 3  | 467-94.  | Water Board—removing main .....          | 3    | 15 | 3  |
| 241-94.  | Federal Timber Co.—timber .....     | 0  | 5  | 1  | 468-94.  | " removing valve .....                   | 6    | 3  | 1  |
| 242-94.  | McEwan & Co.—iron .....             | 3  | 17 | 7  | 469-94.  | " removing scour .....                   | 2    | 7  | 5  |
| 250-94.  | Potts and Paul—lanterns, &c. ....   | 1  | 8  | 2  | 102-95.  | Emu Metal Co.—supply of gravel, &c. .... | 6    | 14 | 5  |
| 270-94.  | Ahern and Others—wages .....        | 20 | 5  | 3  | 326-94.  | Railway Commissioners—freight .....      | 0    | 15 | 7  |
| 275-94.  | Bramston—wages .....                | 15 | 12 | 0  | 107-95.  | Potts and Paul—wire .....                | 0    | 1  | 3  |
| 315-94.  | Ahern and Others—wages .....        | 18 | 14 | 4  | 208-94.  | Federal Timber Co. ....                  | 4    | 13 | 0  |
| 319-94.  | Isles—cartage .....                 | 2  | 11 | 0  | 220-94.  | Ahern—wages .....                        | 2    | 2  | 0  |
| 323-94.  | " .....                             | 1  | 0  | 0  | 191-94.  | New Zealand Timber Co. ....              | 4    | 4  | 10 |
| 327-94.  | Curnow—smith's work .....           | 0  | 11 | 9  |          |  |      |    |    |
| 342-94.  | Sandy—oil .....                     | 1  | 1  | 8  |          |  | £238 | 1  | 4  |
| 354-94.  | Bramston—wages .....                | 15 | 12 | 0  |          |  |      |    |    |

and there were two or three men working at Iron Cove some time before they began to construct the culvert at Strathfield. They had to prepare certain material, and it had to be carted from Iron Cove. The total I bring out is £238 1s. 4d.; but in regard to voucher 414, £23 0s. 11d. for Aherne and others for wages, I find that Mr. Symonds had to take two or three men away to Five Dock to do some little work there, and I give him credit for £13. That would make the total cost of the culvert £225—that is, irrespective of salaries, the cement which was taken from Iron Cove stores, and an amount for cartage. They had to cart the cement from Birkenhead to the culvert at Strathfield. Then there is the salary of Mr. Symonds, junior, for supervision.

8069. There can be no doubt that the vouchers now before you are the vouchers which passed through your hands, and to which you referred when you last gave evidence? Yes; I thought I should be able to get papers which would enable me to trace the items which were charged to the Callan Park work, but I am unable to trace that information because of the want of papers. They say the papers were never in existence, but I say they were.

8070. Have you ever had a culvert of a similar description pass through your hands at such a cost as that incurred for the Monier culvert at Strathfield? I do not remember it.

8071. Mr. Hickson wrote, on 18th July, 1894: "The Monier system of concrete arching has been patented in the Colony by Messrs. Carter & Co. Where applicable it reduces the cost of spanning an opening by about 50 per cent. The patentees are willing to allow the Department to use the patent on payment of a royalty of 15 per cent. on the cost of the arch. I recommend this for the Minister's approval. I might state I have just completed, with the permission of the patentees, a culvert on the Parramatta Road built on this principle with most satisfactory results, financially and otherwise;"—is that a correct statement of the case? From what is shown on the documents it was not correct; but I suppose Mr. Hickson would be advised by Mr. Smith that it was a correct statement. Mr. Smith, I presume, would present a report to Mr. Hickson, and upon that report Mr. Hickson would act.



- T. W. Bryant. 8072. Mr. Smith stated before His Honor that a saving of 35 per cent. was effected by the adoption of the Monier system in the case of this culvert? He is entirely wrong there. I have given you the actual facts as to the cost of the culvert. Those facts were taken from the vouchers.
- 10 July, 1896. 8073. If Mr. Davis has also stated that there was a saving of 100 per cent. by the adoption of the Monier principle in this culvert, that also would be incorrect? Yes.
8074. Instead of the Monier work being 50 per cent. cheaper it is more like 100 per cent. dearer? I should say that it is about that.
8075. *Mr. Smith.*] You say you have looked through all these papers and that you cannot find those you want? Not the papers for which I asked—that is the authority of the Minister or the Commissioner for the construction of the work. There must have been authority to construct the culvert. It could not have been constructed without authority. There is a paper showing that it was proposed to get a sum of money placed upon the estimates, but the other papers, following that, are not forthcoming.
8076. What are the papers which you expected to find, but which you have not been able to discover? The papers showing the Minister's approval or Mr. Hickson's approval to the pulling up of the old culvert and the construction of the new one—the papers showing their sanction for the expenditure of the money.
8077. You have seen all the papers which relate to the cost, have you not? I have the vouchers as far as they can be traced in the absence of the missing papers.
8078. You make the total payments amount to £238, from which you deduct £13 on account of two or three of the men being at work for a short time at Five Dock;—you make a total of £225 irrespective of cement and other material taken from Iron Cove, and the salary of Mr. Symonds, junior? Yes.
8079. I think you have said that you were a sort of general clerk to Mr. Smith? Yes.
8080. Did you go on to the works in your capacity of general clerk? No. I was a clerk in the office.
8081. Where was the office? For two years the office was in Elizabeth-street, but when the new building was completed we went into that.
8082. Where were the offices when this culvert was being built? In this building.
8083. You were not upon the work at all? No.
8084. So that the only way in which you could arrive at the conclusion that particular items were expended upon the work would be from an examination of the vouchers? Yes.
8085. Have you any idea as to how long this culvert was in course of erection—would it be weeks or months? Roughly speaking, I should say from eight to ten weeks.
8086. Were the men who were employed upon it employed during the whole of their time for that eight or ten weeks? Yes. The men were employed for the whole of their time upon the job during the whole of the eight or ten weeks. Some of them were employed considerably before that preparing for the work.
8087. But take the eight or ten weeks during which you say the men were employed upon this particular job;—could you not say what proportion of the time during that eight or ten weeks they were employed upon it? No. I think Mr. Symonds could give you that information.
8088. But can you say definitely whether the men who, you say, were paid upon this job were employed upon it during the whole of their time for the eight or ten weeks? I should take it to be so from the vouchers.
8089. As to the cement you mention in your list, £20 5s. and £16 4s. for Cullen Bullen cement;—are you prepared to swear that the whole of that cement went into the work? I should take it that it was so.
8090. But as a matter of fact you do not know how much of the cement went into the work, whether a half of it, a third of it, or a fourth of it? I could not say.
8091. Are you prepared to swear that the whole of the men engaged upon this culvert were employed upon it during the whole of the time named in the papers? No. That would not come within my province.
8092. As to Mr. Bramston, there are two vouchers showing that he received two amounts of £15 12s. for his month's salary;—are you prepared to say that the whole of his time was put in on this work? I should say so.
8093. You think the whole of Mr. Bramston's time for two months was put in on this work? I should think so.
8094. How do you arrive at that? I should think that Mr. Bramston would not be prepared to sign the voucher from which that information could be derived if it were not the case.
8095. It is only from an inspection of the vouchers that you make these statements? Yes.
8096. Supposing Mr. Smith said that Mr. Bramston was employed only eight days? That is a matter between himself and Mr. Symonds.
8097. But you do not know absolutely? No; I could not say absolutely.
8098. With regard to this period of eight or ten weeks, during which you say the work was in construction, have you any idea when it began, and when it ended? No. They were preparing for the work at Iron Cove considerably before it was actually commenced. Some of the material to be put into the work had to be prepared at Iron Cove. You will see that they carted some cement from Iron Cove, and that they afterwards began to buy cement from different firms. Then the wages commenced, and so on. Altogether, the work may be said to have been in operation long before they actually got on to the job.
8099. In the case of voucher No. 414, you have deducted £13 0s. 11d.? Yes, for work done at Five Dock. Mr. Symonds thinks the amount would not be so much as that; but I have given credit for the odd money.
8100. As to the transfer of money from the grants for Callan Park and Black Wattle—you are satisfied that part of the money voted for those works was utilised upon this culvert? I think it was. I wanted the original papers to check the amounts drawn from those grants.
8101. And you have not been able to check the amounts? No, owing to the want of the papers.
8102. As to the Callan Park grant, and as to what became of the money—do you know anything at all about it? Yes.
8103. What would the amount of the grant be? £1,000 in all; it was an advance made by Sir George Dibbs to Dr. Manning.
8104. How much of it was expended? Up to about the time I left between £800 and £900 were expended out of the £1,000.
8105. Upon that particular work at Callan Park? The Callan Park vote was operated upon for other purposes.
8106. What other purposes? Wages were drawn from it for other road works,

8107. Can you specify any item in these vouchers? I could not do so accurately unless I had the papers. T.W. Bryant.
8108. What makes you think that any of the Callan Park grant was expended in other work? I remember distinctly that it was so. 10 July, 1896.
8109. Is it not shown in the ledger-book? No.
8110. If any of the grant for Callan Park was expended upon other purposes would it not be under your supervision and control? No.
8111. Cannot you say from looking at the book which of the items was charged to Callan Park grant? No.
8112. The items to which you refer would be entered under the heading of Callan Park, and would be charged against the grant? Yes.
8113. Then, according to your evidence, those entries would be wrong? No.
8114. Some of the money represented by these entries was not expended at Callan Park, I understand? Some of it.
8115. Yet it was charged to Callan Park in that book by your direction? Yes.
8116. *His Honor.*] Do you say that amounts which were not expended upon the work at Callan Park appear under the heading of the Callan Park account? Yes. Take the entry under the name of Gilson. He may have performed a certain amount of labour at the culvert at Strathfield under Mr. Smith's directions. Mr. Smith might have gone to the culvert and found that an extra man was wanted. A man might then have been sent up at once from Callan Park. If men were wanted there, they might be sent from any place under Mr. Smith's control.
8117. *Mr. Smith.*] Do you know whether the men employed at Callan Park were employed upon the Parramatta Road culvert, or do you actually know anything at all about the matter? I could not say definitely.
8118. *His Honor.*] What makes you make the statement indefinitely? Because I know that Mr. Smith got me to send for the men.
8119. Would the whole of their time be entered against Callan Park, or would a part of their time be entered against the Strathfield work? I remember Mr. Smith telling me several times to charge the Callan Park grant for work which was done at Strathfield, and it was charged accordingly.
8120. You remember his telling you to charge it to that grant? Yes, to make out vouchers against the source from which money would be available. Perhaps the grant for one road would not be sufficient, and in such a case we should be told to draw upon the grant for another road.
8121. *Mr. Smith.*] But in the case of this particular culvert, do you distinctly remember Mr. Smith telling you to charge the wages against the Callan Park account, and did you, upon his instructions, charge that account with any work which admittedly had been done at Strathfield? Yes.
8122. Did Mr. Smith actually tell you to charge against the Callan Park account wages which had been actually earned and which were known to him to have been earned on the Strathfield culvert:—would you say that? Yes; I would say that. Aherne's case was one, and Branston's case was another. To the best of my knowledge their wages were charged afterwards to the Callan Park account. I think the same course was taken in the case of Wilson, the carter.
8123. *His Honor.*] How was Bramston paid—was he not paid a salary? He was paid by the day. I think he received 12s. a day.
8124. For supervision? Yes; over him again there would be Mr. Symonds, junr.
8125. *Mr. Smith.*] Were either of the items of £15 for Mr. Bramston charged against the Callan Park account? Yes.
8126. *His Honor.*] What I understand was done in regard to the supervision was this—Mr. Bramston was there to superintend the men; Mr. Symonds, junr., was there to superintend Mr. Bramston; Mr. Symonds, senr., was there to superintend Mr. Symonds, junr.; and Mr. Smith was there to superintend Mr. Symonds, senr.? Yes.
8127. *Mr. Smith.*] That is your evidence as to the way in which the work was carried out? Yes.
8128. As to the Callan Park grant—do you or do you not know that the whole of it, with the exception of £227, was expended at Callan Park;—if that statement were made, would you be prepared to contradict it? All I can say from my knowledge obtained from drawing the vouchers is that some of the labour charged to that account was performed at other places.
8129. The balance of £227 was unexpended and was written off? Yes, I believe so.
8130. As to the grant for work at Blackwattle—what do you know about that? Some items were charged against that in the way of wages. I think, roughly speaking, that the grant was £80. I am only speaking from memory. My mind is to some extent in the dark until I see the papers.
8131. Was any part of the grant spent on work other than that at Blackwattle? Yes; I think that in the case of one or two items it was.
8132. What sort of items would they be? Wages, I should think.
8133. I think you said when you were last examined that the Department had to send for you after you had left to adjust Mr. Smith's accounts? Yes.
8134. Is it the fact that you did so? Yes.
8135. Do you say that you really adjusted the accounts? Yes.
8136. What do you mean by that? Certain items had to be put right, because the accounts would not balance.
8137. Do you remember what they related to? To Mr. Smith's deposit account.
8138. Was there nothing else? Nothing else among the items.
8139. Do you remember one item of £7 12s.? I do not know.
8140. Was not that the only item? There were a lot of matters to be attended to.
8141. Was it not a fact that there was only this item of £7 12s. which ought to have been brought into Mr. Smith's banking account and which was not there? I do not know what the amount was now, but I afterwards adjusted it at the bank.
8142. Was not that the only item you had to adjust? I could not say.
8143. Think a moment? I could not say.
8144. You are not able to say whether or not there was any item besides that £7 12s.? I could not say. I know they were mixed up as regards his balance.
8145. Do you know what the item of £7 12s. was? No.

- T. W. Bryant. 8146. Was it not a cheque of Meeks and Wheeler, which they had sent in as a deposit? I remember that there were some of the items in the deposit account which they could not work out.
- 10 July, 1896. 8147. But I want you to keep for the present to this one item;—was it not a cheque of Meeks and Wheeler? I could not say.
8148. Was it not a cheque paid in by a firm of contractors as a deposit, and which ought to have appeared in Mr. Smith's Banking account containing the deposits? I believe that was it; but one would imagine from your question that I had been in the service up to the present moment. It is impossible to remember all these things.
8149. I want you to fix your mind upon this one item? I have been entirely away from the service and it is difficult for me to do so.
8150. How was the matter cleared up? I cleared it up through the Bank.
8151. In what way? By going to the Bank.
8152. What was the explanation? I remember that there was one item in particular which was entered wrongly. It was entered to a firm of the same name.
8153. Instead of being entered to Mr. Smith's account? Yes. That is how that item was found.
8154. Is that not the whole history of the matter—that this cheque of Meeks and Wheeler for £7 12s., paid to Mr. Smith as a deposit, did not appear in his Banking account? I could not say.
8155. Is it not a fact that, as you had been in charge, you were called upon to explain the matter, and that, after going into it with the Bank, it was found that this cheque of £7 12s., through an error on the part of the Bank, had been paid into the account of another Smith? The explanation of one of the items was something like that.
8156. Is not that the whole history of the matter? No.
8157. Was there anything beside that you had to put right? I could not say.
8158. But, speaking from your memory, is there anything beyond that item you were called back to deal with? I could not say definitely.
8159. You said on a former occasion that the Department had called you back to adjust Mr. Smith's accounts? Yes.
8160. And you thought that a truthful way of giving your evidence? Yes.
8161. Mr. Symonds, senior, I believe, paid the whole of the men upon his portion of the Main Western Road? I think he made the bulk of the payments.
8162. How far does the portion of the Main Western Road, over which Mr. Symonds, senior, had control, extend? From the Glebe to the Blue Mountains.
8163. *Mr. Gummow.*] What was your ledger for;—what was it intended to show? It is an account kept for the information of the engineer of the district.
8164. Is it not supposed to be a proper record of where the money is expended? No.
8165. Take the case of the culvert at Strathfield of which we have been speaking? A great proportion of the expenditure was operated upon by Mr. Symonds of Parramatta, who also kept a ledger. Mr. Smith had drawn for the work, and an account was kept of that at the other end. If I am not mistaken he drew £16 odd.
8166. *His Honor.*] But that is not an answer to Mr. Gummow's question as to the meaning and object of the ledger? It was for Mr. Smith's information.
8167. Take the culvert at Strathfield as an illustration;—were the entries made in the ledger supposed to be the whole of the charges against that culvert? They were supposed to be; but in the meantime Mr. Smith changed his mind and handed it over to Mr. Symonds at Parramatta.
8168. Then this ledger would show only part of the account, and the rest would be shown in Mr. Symond's book? Yes.
8169. Is Mr. Symond's book ever amalgamated with this book;—are not the credits and debits entered finally in one book to show what the whole expenditure upon the work has been? They are supposed to be amalgamated at the head office, under Mr. Carroll.
8170. Would the account in that office show distinctly the headings of the different works as they are shown here? That would all depend upon the grants; their entries would be entirely different from ours.
8171. Under the grants do you mean? Under different votes or grants. There is what you would call a liability-sheet. They do not keep their accounts together; they split up the amounts of different grants.
8172. *Mr. Gummow.*] You said that some money which had been expended upon this culvert at Strathfield had been entered under another heading? Yes, I think so, as far as my memory serves me.
8173. Is it of any use at all to keep books if that is the state of affairs? I have already explained that this book is kept for Mr. Smith's information, so that he may know how he is spending the money.
8174. But what is the good of the book if it does not show where the money is spent? I think that is a matter Mr. Smith should explain.
8175. What I want to know is of what use are the books if they do not explain where the money is expended;—would it not be better to have no books at all than to have books containing statements which are entirely untrue? As far as this book is concerned Mr. Smith had it kept to show the amount of money at his command in connection with the employment of labour and the completion of contracts. The distribution of the money is a matter entirely within his own control.
8176. Should not the book show where the money was expended? It should do so.
8177. And would it not be better to have no book at all than to have a book showing mis-statements? I could not say.
8178. But I want to know your opinion? If I kept a set of books I should like the items which appear to represent exact facts.
8179. Suppose that in the case of this book they do not appear as exact facts? I am not here to explain that.
8180. As to this Monier culvert at Strathfield, you say that it cost a good deal more money than another class of culvert which could have been put in would have cost? I cannot speak as to that. I know that it has cost double the amount which Mr. Smith says it has cost.
8181. *Mr. Smith.*] When you were last examined you said that the head of the Department might recommend an expenditure of, say, £115 or £120 for a job, and that you were supposed to keep within that amount, but that if when you got on to a work you found that an extra expenditure was required, then if Mr. Smith thought it not prudent to ask the Minister for more money, then the money required was taken from some other grant. I should like to know how often that happened? It was the usual thing during all the time I was with Mr. Smith.
- 8182.

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8182. Do you say it was the usual thing? Yes.
8183. Can you mention any other job with the exception of those of which you have been speaking this morning in which it was done? No.
8184. Could you mention any one job besides those where this thing was done? I cannot; but I am confident that Mr. Symonds will bear me out as to the practice. I have known Mr. Symonds and Mr. Smith to have disputes over this very thing. I remember, for instance, that Mr. Symonds objected to the money required for the culvert at Ormond-street being taken from the Main Western Road grant. He wanted a special grant from the Minister for the work.
8185. *His Honor.*] What I understand is this, that Mr. Symonds wanted the money spent upon the ordinary work of maintenance, and not upon any particular new work? That is so.
8186. *Mr. Smith.*] Can you remember any other case in which what you call the usual thing was done? I could not say at this moment.
8187. How long were you there? About four years.
8188. And was it the usual thing during the whole of that time? Yes.
8189. How often, speaking roughly, would it be likely to have occurred during that time? It was done so often that I could not say.
8190. *Mr. Parkes.*] When you transferred items of expenditure from one work to the cost of another, did you do so upon any definite instructions? Yes, from Mr. Smith.
8191. In that matter you always acted under his instructions, did you? Yes.
8192. What were you paid by the Department when you came back to adjust Mr. Smith's accounts? It occupied me three or four days, and I think I was paid about £2.
8193. You would not be likely to be paid that amount for making a search at a bank for this one amount;—did you not do any more work? I had a lot of running about during the two or three days. I found it very difficult to get the information.
8194. Did you receive a letter of testimonial from the Department when you left? Yes. I referred to it a day or two ago when I was examined here.
8195. You received a letter expressing approval of your conduct during the time you were in the Department? Yes.
8196. Suppose you had the necessary books and the opportunity to make a search, could you find other cases where Mr. Smith took money from one work and expended it on another? It could not be got at easily. The thing would have to be done in his own office. The accountant would object to the doing of such a thing.
8197. But if it were done, could it be found out? No, not easily; the amount might be charged to the Main Southern or the Main Western Road.
8198. Suppose you made a search, could you find these cases? I do not think I could; but Mr. Symonds will bear me out when I say that there have been disputes between himself and Mr. Smith over this very point.
8199. Does your difficulty arise from the impossibility of discovering the vouchers? It is almost impossible to hunt up all the necessary papers.
8200. Once papers are done with in the office they seem to be lost for ever? They go out of sight. I know that Mr. Symonds on more than one occasion complained that Mr. Smith was taking money from his road grant. When Mr. Symonds was prepared to advertise for certain work to be done on a particular road, it was found, in some cases, that a half or a fourth of the money had been used. I have known cases in which he has spoken to Mr. Smith about that.
8201. *His Honor.*] Do you mean that this money was used upon other roads or for some special purpose upon your own road? Mr. Smith used it in his own district, and I remember Mr. Symonds complaining of it on one or two occasions.

James Symonds re-called and further examined:—

8202. *Mr. Parkes.*] You have made a search among the papers referring to the Strathfield culvert? Yes. *J. Symonds.*
8203. Have you completed your search? Yes.
8204. And have you obtained all the papers you require? All that I need, I think. *10 July, 1896.*
8205. You recollect the culvert being built upon the Monier principle? Yes.
8206. You were engineer for a portion of the Main Western Road at that time? Yes.
8207. Was it your duty to pay the men? Yes.
8208. Did you pay away all the money by voucher? Yes; I think so.
8209. Did all the vouchers in connection with that work pass through your hands? Not quite all. Mr. Smith proceeded in that in the first place, independently of me, but he afterwards handed over the work to my supervision.
8210. Are those vouchers before you those which you picked out yesterday as having reference to the work? Yes; they are the vouchers. Nos. 191, 220, and 208, represent material for which Mr. Smith paid before handing the work over to me.
8211. After that did the remainder of the vouchers pass through your hands? Yes.
8212. And can you swear positively that all the money set forth in these vouchers was expended upon that particular culvert? It was, with the exception of one, which I made a note of. It had to do with the construction of a small pipe culvert. It was carried out at the conclusion of this work, and I have allowed £13 for it.
8213. What is the total expenditure upon this Monier culvert according to the vouchers? £238 1s. 4d.
8214. Does that include all the expenditure you know of? I am not certain that it includes all the expenditure. I have been informed that a certain amount of cement was taken for the work from the Iron Cove store prior to my having anything to do with the matter.
8215. Therefore, if Mr. Smith represented to His Honor that the culvert cost only £114 that statement was not correct? It was not correct.
8216. Did you see the report of Mr. Smith's evidence in the newspapers? Yes.
8217. Did you write to him? Yes. I wrote to him asking him to amend his statement.
8218. *His Honor.*] Did you keep a copy of the letter? No; but I can remember the effect of it. I told him that I had noticed his statement before the Commission. I told him that he had made a mistake, and I recommended him to amend it, or I said that I might be tempted to proffer evidence on the point.

8219.

- J. Symonds. 8219. How long was it after you saw the report of Mr. Smith's evidence that you wrote that letter? Two days afterwards, I think. It was written on Saturday last.
- 10 July, 1896. 8220. Have you received an answer? I have not.
8221. *Mr. Parkes.*] Did you expect that Mr. Smith would come forward and amend his evidence? I thought that when it was pointed out to him that he had made a mistake he might amend it.
8222. Will you look at that document and tell me whether you have seen it before? Yes; it is an estimate which I sent in on 17th August, 1883, as to dangerous culverts on the Main Western Road between Sydney and Parramatta. I said: "There still exist on the above length of road dangerous culverts which at various times have been reported as unsafe or inefficient. No. 1, near Ormond-street, Ashfield—a new culvert required; No. 2, at Wentworth Road, Burwood—a new culvert required; No. 3, at Auburn—a new culvert required. As each of these culverts should be in brick or concrete work, and requires to be about 60 feet in length, a sum of not less than £500 will be required." I may mention that both the other culverts mentioned in the recommendations are bigger than the culvert at Wentworth Road.
8223. The £500 was intended to cover the expenditure upon the three culverts? Yes.
8224. If Mr. Davis or Mr. Smith has said that you sent in a report that £300 was required to cover the cost of the culvert at Wentworth Road, that is incorrect? Yes.
8225. What was the proportion of the £500 which you proposed to expend upon that culvert? I think I made an estimate that an expenditure of about £110 would be required at that place.
8226. That was for a circular brick culvert? Yes.
8227. Suppose another method of construction had been adopted—suppose the culvert had been 5 feet in width with 9-inch brickwork over it, and with stone abutments, would it have cost as much as £256? I do not think it would. I have not made an estimate.
8228. Would it have cost much more than the circular culvert you proposed? Yes; it would cost about double what I put down. I suppose it would have cost about £200; but there was no necessity for that size of culvert.
8229. Comparing the Monier culvert with a culvert such as I have described, would there have been a saving of 50 per cent. by the adoption of the Monier culvert? I could not say. I told Mr. Smith that I did not think there would be any saving by adopting the Monier system. I said I could not see where the saving would come in.
8230. Supposing the culvert had been covered with buckle plates, would it not have been a great deal cheaper? It was not recommended, because there was no necessity for such a culvert.
8231. What would a buckle plate culvert have cost? Judging from the culverts we have constructed in other places, I should say that it would have cost £150 or £160.
8232. Have you on any occasion taken money from the account of one work and placed it to the credit of another? I do not say that such a thing has never been done. For instance, supposing a bridge were being constructed on the Main Western Road, and that I had a special sum for it, if the sum did not quite cover the expenditure I might take the remainder out of the Road Vote. That is what is usually done.
8233. Do you know whether, as a matter of fact, any of the expenditure upon the Monier culvert at Strathfield was taken from the Callan Park grant? I do not know about that.
8234. Were the whole of the vouchers paid from the Main Western Road account? With the exception of the three vouchers to which I have already referred.
8235. Was the Strathfield culvert built out of the Vote for the Main Western Road? I believe it was paid for out of a Special Vote of £10,000 given by the Secretary for Works for relief works.
8236. Where were these relief works to be constructed? Partly on the Main Western Road. I think £2,000 was allotted to me for works upon the Main Western Road.
8237. Are you sure that, with the exception of the three vouchers you have named, the rest of the vouchers in connection with the Strathfield culvert were paid for out of the Main Western Road Vote? They were. A sum of money intended especially for relief works was granted for the road, and that was put with the expenditure upon the Main Western Road. The two things were made into one account.
8238. Would that include the Callan Park work? No.
8239. Was any of the work in connection with the Strathfield culvert paid for out of the Callan Park grant? I do not know that it was.
8240. Was any material for this work paid for from the Callan Park grant? Not that I am aware of.
8241. Could you swear that it was not so? I have no reason to suppose that it was so, apart from the question of the cement which was supplied from the Iron Cove store. That might have been paid for from the Callan Park grant.
8242. Is there any voucher for that cement;—were all the vouchers for the payment of wages to the men employed upon the culvert? There were two vouchers for cement, but that was for the supply of cement before the work came to me.
8243. Were all the vouchers charged against the Main Western Road Vote? With the exception of those showing that Mr. Smith paid a carpenter £2 2s. for making a centering, and that he had paid for other material.
8244. Were the wages in any of these vouchers charged against the Callan Park grant? I do not know that they were.
8245. Are you in a position to say whether they were or not? According to the vouchers they were not.
8246. Would the vouchers indicate where the money was paid from? I am certain they were paid from the Main Western Road Vote, because they came into our books.
8247. Was it ever your practice to take money from one work for use upon another;—for instance, suppose you had a bridge to build in one position, and another bridge to build in another position, would you adjust their cost by taking money from one Vote and expending it in connection with the other work? No; I do not know that I ever did that. It has only been done in the way I have suggested. If there were two bridges on one road, and if I had a balance in respect of one bridge, I might possibly spend it on the other bridge if it were required.
8248. Is the maintenance money voted annually for the Main Western Road supposed to go to the construction of a new work such as a new culvert or a new bridge? It is supposed to include small works, but not large ones. We generally ask for a special sum for anything over £200.
8249. When you have obtained such amounts, have you taken the money from one vote to provide what has been necessary in connection with another? Yes; in the way I have explained. 8250.

8250. Supposing £500 were voted for a bridge somewhere and that the bridge were found to cost £1,000, would you take the extra money from the ordinary road vote? No; in such a case a further grant would be asked for. Possibly a sum of £100, or so, might be taken from the ordinary road vote under special circumstances, but it would not be a greater sum than that. J. Symonds.  
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8251. *His Honor.*] Have you had occasion to expostulate with Mr. Smith on this very point—the transference of money from one vote to another? No; but I have sometimes been very much vexed about it. I remember that in one case a certain number of men were employed in the Sydney district and were paid from my money for the Windsor Road, 20 or 30 miles distant.

8252. Up to what amount, roughly? I suppose £30 or £40.

8253. Was that the only occasion, or have there been other occasions? There have been other occasions, but I cannot call them to mind just now. I know I complained at the time of their operating upon my vote. I thought it was very unfair.

8254. Can you say, roughly, how many times this sort of thing has happened? The thing has been done many times, and I have known nothing about it. They have charged works against the main Western and main Southern roads, and I have known nothing of it.

8255. Did you expostulate with Mr. Smith on those occasions? I did expostulate with him. I said that I could not keep my accounts straight if money were spent in this way without my knowledge.

8256. Can you give us an idea of the largest amount transferred in this way in one lump sum? I have kept no special account of it. With regard to the Windsor Road matter, I know that when that took place I pointed out that men who were employed in Sydney certainly ought not to be paid from a country road vote. I thought it very unfair that the vote for the road from Parramatta to Windsor should be trenched upon in order to clear up accounts in Sydney.

8257. Can you not give us an idea approximately as to how often that sort of thing has occurred to your own knowledge? I could not say exactly. It will be a long time back now, and I kept no record of these matters.

8258. Would it have happened half a dozen times, or less? It would have happened a greater number of times than that.

8259. Would it have happened a dozen times? I dare say it would.

8260. Would it have happened more than a dozen times? I cannot distinctly recollect a dozen cases, but I know that the question often arose.

8261. Had the practice ceased shortly before you left the Department, or was it then continuing? I did not complain so often about it during the latter part of my term.

8262. For how many years or months was it before you left during which you had not cause to complain? I do not think I had any cause to complain during the last year of my service. They seemed to imagine in Sydney that they could do as they liked with our vote.

8263. As to this Monier work—can you say whether any men were actually employed upon that culvert whose names do not appear in the vouchers charged against that particular work? I am not aware of it being done after the work came under my direct supervision. If the men were paid from any other vote or grant it would be at the commencement of the work, when Mr. Smith was superintending it independently of me.

8264. Would it be possible for men to be sent over from Callan Park, or from some other work, to do work upon this culvert for a day or two, and then for their wages not to appear at all in connection with the culvert accounts? I do not think that happened.

8265. You do not think that any men were put on to work at the culvert who were regularly employed at another place? I think I should have noticed that had it been done.

8266. I suppose each man's time was kept? Yes; my son kept the time and made up the vouchers, and I paid the men.

8267. I suppose that if your son had been directed not to keep the men's time he would not have done so. Suppose, for instance, he had been told not to keep the time of men who had come on to the work from some other work for a period of two or three days? He would be working under Mr. Smith, and if Mr. Smith directed him to do such a thing he would probably obey his orders; but I do not think such a thing happened.

8268. It did not happen to your knowledge? No.

8269. *Mr. Parkes.*] Where is your son now? He is assistant engineer at Stroud under Mr. Allman.

8270. *Mr. Smith.*] As to these vouchers;—you say you have been through them thoroughly, and that the amount expended in connection with this Monier culvert comes out at £238? Yes.

8271. Do you say that the whole of that amount, with the exception of £13, was properly chargeable against the construction of the Monier culvert? Yes.

8272. You mean, I suppose, against the whole affair, including the removal of the old structure? Yes.

8273. As to the cement;—do you say that the whole of the cement appearing in these vouchers was put into the work? I might state that in going through the papers I noticed that about five casks of cement were sent to the Iron Cove store. Excepting that five casks of cement, the other was used on the works to the best of my knowledge.

8274. Now, with reference to the day labour—how long was the work in construction? About six or eight weeks.

8275. Were the whole of the men on it working there the whole of their time during that period? Yes; they were engaged on that work. They were not sent anywhere else to work.

8276. They would not be employed on any other work? They were not employed anywhere else until they had finished, when they were sent to do a small work at Five Dock.

8277. As to Mr. Bramston, he received a salary and was paid monthly? Yes.

8278. And you think that the whole of that two months' salary should be charged against this work? I think so.

8279. Was he doing anything else at the time besides the superintendence of this work? I cannot say. It is possible that he might have been.

8280. Had he other duties? I do not think he had any other work in hand when this culvert was being constructed.

8281. But do you know whether he had or not? He was there whenever I went to the work.

8282. Did you go there every day? No; sometimes twice, and sometimes three times a week.

- J. Symonds. 8283. With regard to the estimates for several culverts to which you have referred, No. 2 would be the work at Strathfield to which we have been referring? Yes.
- 10 July, 1896. 8284. How did you arrive at your estimate of £500 for the three works? I made an estimate for each culvert, and put the three sums together.
8285. What did you put down for No. 1 culvert at Ormond-street, Ashfield? It is difficult to say. I have no data before me.
8286. What did you put down for No. 3? I think it was £160.
8287. And for No. 2? I think it was £110.
8288. Therefore, No. 1 would absorb the balance of the £500? Yes. But I may mention that both No. 1 and No. 3 are larger culverts than the one at Strathfield.
8289. Still you would have £230 left for No. 1? Yes. In making up these estimates it is usual to allow a margin. There are often other matters which crop up. For instance, there is the removal of water-mains and other matters which cannot be foreseen.
8290. You think that £230 left margin enough in the case of No. 1? Yes.
8291. Did you discuss this matter with Mr. Smith before you sent your estimate in? I do not remember doing it.
8292. Did you not some two years before recommend an expenditure of £350 for No. 1 culvert? Not to my knowledge.
8293. You will see that in the document which I now hand you you recommend the expenditure of that amount? Yes.
8294. *His Honor.*] In what year was that? 1892.
8295. *Mr. Parkes.*] What were the dimensions of the culvert? There was a 4-ft. span with 66 feet of roadway, with a buckle-plate top. It is quite possible that in that case I allowed for the removal of water-mains. We knew from our experience that they would have to be lowered. I know that in one case it cost us some hundreds of pounds to lower the mains.
8296. *Mr. Smith.*] You wrote this minute on 4th May, 1892, recommending that £350 be expended on culvert No. 1? Yes; but, as I have explained, a good deal of that would be for the lowering of the water-mains.
8297. *His Honor.*] You had to provide for that? Yes. I remember that in another case, where a culvert was put in, it cost us more to lower the mains than for the culvert itself.
8298. *Mr. Smith.*] Did you take that into consideration when you wrote your minute of 17th August, 1893? Probably.
8299. How did you come to drop from £350 to £230 in the eighteen months? The price of nearly all classes of work had dropped very much. When I left the Department we were doing some kinds of work 50 per cent. lower than the price at which we had been doing it in former years.
8300. *Mr. Parkes.*] Competition had become greater? Yes.
8301. *Mr. Smith.*] As to this transfer of money from one account to another—if you had not enough money in one of your votes, did you ever get any money from another vote;—do you remember doing that? Only in a small way in the last months of the year. For instance, if I had not enough to pay wages on the Main Western Road, and I had a balance on the Main Southern Road, I would borrow the money and pay it back in some future month. I kept my accounts as strictly as it was possible to do so.
8302. When you expostulated with Mr. Smith on the occasion to which you have referred, what did Mr. Smith say? I do not know that he made any reply.
8303. Was any adjustment of the accounts made? No.
8304. Did you state your objection in the form of a minute? I will not be certain that I mentioned it to Mr. Smith directly, but I mentioned it to Mr. Bryant, who was making out the vouchers for him. I remember saying to him, “You have been taking my funds.”
8305. And what did he say? He laughed at that.
8306. *Mr. Gummow.*] I think you have spoken of a brick culvert double the size of the old one;—you mean a culvert with a 4-ft. diameter? Yes.
8307. And that you thought would cost about £220? Yes.
8308. Do you know what a brick culvert having the same waterway as the Monier culvert at Strathfield would cost? I have not gone into that matter.
8309. You could not tell whether it would cost more than £220? Probably it would.
8310. I mean with the same waterway as the present culvert? I should not have put in a brick culvert of that capacity, because it would not be necessary.
8311. How much would a culvert with the same waterway as the present culvert cost;—that is what we want to get at? About the same, I think.
8312. Do you know if you could put in a circular brick culvert with the same waterway as the present culvert? No; I do not think there would be room for it. We might put it in, but it would cost a good deal for the deepening of the watercourse. I do not know whether we could get the fall for the water.
8313. Therefore, that may be left out of the question? Yes.
8314. With regard to the buckle-plates—what is the average life of a buckle-plate? It used to be considered a century.
8315. At that rate they are as durable as the Monier system? I presume so.
8316. *Mr. Parkes.*] If you had built a culvert at Strathfield with 9-inch brickwork instead of on the Monier system, would there have been a saving in that particular case? A 9-inch brick arch would have been cheaper than the Monier arch.
8317. Much cheaper? Considerably cheaper.
8318. The cheapness of the Monier arch comes in in the extent which it spans, does it not;—in a small work such as a culvert it would be more costly, would it not? It might be cheaper with a greater span.
8319. Do you know what the Monier arch in the Strathfield culvert cost apart from the other portions of the work? I have not gone into that.
8320. Do you think it cost £90? I have no separate records at all.
8321. What would you generally allow for brickwork of that kind? Thirty-five shillings a cubic yard generally.
8322. Then if the Monier arch work costs £4 10s. a cubic yard it would be much cheaper to put in an arch of brick? Yes; brickwork would be cheaper than the Monier system.



8323. Taking a Monier arch  $4\frac{1}{2}$  inches thick at £4 10s. a cubic yard it would be dearer than 9-inch brick-work at 35s. a cubic yard? Yes. J. Symonds.  
10 July, 1896.
8324. You think then that it would have been cheaper in this particular case to build a brick arch? Yes. I pointed out to Mr. Smith that there was no saving in what he proposed to do. He said he hoped there would be a good deal of saving, but I told him the Monier work would not be cheaper, and that it would cost more.
8325. Would not a brick arch be more substantial? It would have been quite as good.
8326. *His Honor.*] As to the size of the culvert and the necessity for a large one—do you know whether the former culvert had frequently become choked in times of heavy rain? That was not on account of the size of the culvert, but on account of the bullocks treading in the outlet.
8327. Was that the only reason? That, I think, was the only reason.
8328. Could not the outlet have been deepened? You might deepen it one day, but in the evening a mob of bullocks would come along and the outlet would be trodden in again.
8329. A barrel culvert would not have crossed the whole of the road? It would cross the formation and one footpath.
8330. On the other side there would be a hollow, I suppose, through which the cattle would pass? There was a piece of vacant land and the cattle used to run round that way.
8331. I suppose the ground is now very much more built upon than it was, yet you say that it is not a proper thing to put in a culvert of the size which was put in? I do not think it was necessary, because a 2-ft. diameter culvert would have taken the water.
8332. Have you measured the area and calculated out the probable discharge? No; but I know that it was not large.
8333. You have not gone into the question specially. You have considered it only in a general way, and it appears to you that a 2-ft. diameter culvert would have been big enough? In these matters I generally take a general view of the country; I find I am usually correct as to the size of the culverts put in.
8334. Has not your experience been that nearly every culvert on your roads has had to be enlarged? No. In some cases we have taken out a comparatively large culvert and have put in a 1-ft. 6-in. pipe, because it has been found sufficient. Some of the earlier bridges and culverts were put in without any regard whatever to requirements.
8335. *Mr. Smith.*] You said you put down the Ormond-street culvert at £230, and that you put down the Wentworth road culvert at £110,—is that so? Yes.
8336. I believe the Ormond-street culvert was 66 feet in length with a span of 4 feet? Yes.
8337. And the Wentworth road culvert was 55 feet in length with a span of 5 feet? Not according to my plans, which were for a 2-ft barrel drain.
8338. What had you in your mind as to the new culvert, if it were to cost only £110? I had in view a 2-ft. barrel drain, and to prove that that was sufficient, I may mention that Mr. Smith himself made provision for four 9-in. pipes leading down into the culvert.
8339. So that it was a smaller work? I said "What is the good of putting in a large culvert of that size and then putting these small pipes into it?"
8340. *His Honor.*] Where were the four 9-in. pipes to come in? They would lead the water from the water-tables into the culvert.
8341. And would that be the whole of the discharge the culvert would have to carry? Yes. I think that finally it was constructed with only 12-in. inlets.
8342. *Mr. Smith.*] If it were necessary to have a culvert of the size which is now there, what would have been your estimate of the cost? I do not know. I never made an estimate.
8343. Would there have been much difference between your estimate for a culvert of the size which was constructed and the No. 1 culvert in your recommendation? It would probably have been about the same price, supposing such a culvert to have been necessary.

George Christie recalled and further examined:—

8344. *Mr. Parkes.*] You have read the evidence given by Mr. Carter with reference to his business transactions with various officers of the Department, and I will ask you now to read the report which you have handed to me concerning the transactions of Mr. Carter with Mr. Weedon. I think Mr. Carter said the transaction was one of a private nature, whereas your researches have shown that it was a transaction with the firm;—is that not so? I have here a statement of certain facts, and I shall be pleased to answer questions as to what might be inferred from those facts. G. Christie.  
10 July, 1896.
8345. Will you read the statement? Yes.

MEMO. No. 3.

*Re* financial dealings of Messrs. Carter, Gummow, & Co., with Mr. S. H. Weedon, Government Resident Engineer, Sewerage Construction Department; and as to payments of interest.

(a) In the documents furnished by the Bank of New Zealand, in connection with Messrs. Carter, Gummow, & Co.'s account with that Bank, information was disclosed showing that a cheque of Mr. Stephen H. Weedon, for £2,000, had been paid in to the credit of the contractors on the 18th June, 1895.

Following upon that information I have made certain investigations and inquiries, particularly at the English, Scottish, and Australian Bank, where Mr. Weedon has his banking account, and am now able to state as follows:—

1. The identical cheque for £2,000 which had been paid into Carter, Gummow, and Co.'s account with the Bank of New Zealand was debited against Mr. Weedon's account with the English, Scottish, and Australian Bank on the 19th June, 1895, the cheque itself being dated the 17th June, 1895.
2. On the 1st of August, 1895, the balance at the credit of Mr. Weedon in the aforesaid banking account was under the sum of £50. On the 2nd May, 1895, the sum of £1,000 was placed to his credit, and on the 27th May, 1895, a second sum of £1,000 was also placed to his credit. This £2,000 represented money which was due to Mr. Weedon personally from Brisbane.
3. After the cheque for £2,000 which had been paid to Messrs. Carter, Gummow, and Co., was charged to Mr. Weedon's account, the balance was less than £50 to his credit.

(b)

G. Christie.  
10 July, 1896. (b) I have also in this connection specially examined the accounts with the Bank of New Zealand in the names of Carter & Co. and Carter, Gummow, & Co., as disclosed by the pass-books, and the cheques and other vouchers which have been obtained from the Bank, and find the following.—

The balances of these accounts were on the 31st March, 30th June, and 30th September, 1895, as follows, viz. :—

|   |             | £      | s.    | d.  |
|---|-------------|--------|-------|-----|
| 1895.   |             |        |       |     |
| 31st March.—Carter, Gummow, & Co., credit           |             |        | 3,709 | 7 2 |
| Carter & Co., debit.                                |             | 6,781  | 17    | 1   |
|   | Net debit   | £3,072 | 9     | 11  |
| 30th June (after Weedon's £2,000 had been paid in). |             |        |       |     |
| Carter, Gummow, & Co., debit                        |             | 1,550  | 17    | 11  |
| Carter & Co., debit                                 |             | 1,507  | 12    | 9   |
|   | Total debit | £3,058 | 10    | 8   |
| 30 September.—Carter, Gummow, & Co., debit          |             |        |       |     |
| Carter & Co., debit                                 |             | 4,067  | 5     | 11  |
|   |             | 606    | 19    | 4   |
|   | Total debit | £4,674 | 5     | 3   |

During this period, from 31st March to 30th September, 1895, there are certain deposits of money from sources outside of their Sydney contracts, such as—

|  |  | £     | s. | d. |
|--|--|-------|----|----|
| <i>In</i> Carter, Gummow, & Co.'s account.                         |  |       |    |    |
| From Adelaide during the three months ending 30th June             |  | 1,804 | 4  | 1  |
| From S. H. Weedon, 18th June, 1895                                 |  | 2,000 | 0  | 0  |
| Transfer from Carter & Co., North Shore account, 26th August, 1895 |  | 2,000 | 0  | 0  |
| <i>In</i> Carter & Co.'s Account.                                  |  |       |    |    |
| From Billyard, Andrews, and Moseley, 10th April, 1895              |  | 4,500 | 0  | 0  |

During the period under review the contractors had to make very heavy payments for purchases of material and to provide for certain payments out of capital for retiring partners, and also to provide for similar heavy claims in the months immediately following.

Certain payments might be mentioned, such as the following :—

|                                     | £     | s. | d. |
|-------------------------------------|-------|----|----|
| Maddison (retiring partner)         | 2,780 | 0  | 0  |
| Ewing                               | 2,250 | 0  | 0  |
| Mort's Dock and Engineering Company | 3,468 | 2  | 7  |
| Parbury, Henty, & Co.               | 2,946 | 16 | 10 |
| Scoutton, R. L.                     | 649   | 10 | 0  |
| Fuller and Sons                     | 400   | 0  | 0  |
| Hervey                              | 395   | 16 | 8  |
| Deposit on Contract 77 (29th April) | 775   | 0  | 0  |
| „ „ (6th June)                      | 605   | 0  | 0  |

It might also be mentioned that on the 8th March, 1895, the sum of £3,500 was paid, through Messrs Billyard, Andrews, and Moseley, to retire the mortgage for that amount with a view of borrowing an additional £1,000, as shown by the deposit of £4,500 on 10th April, 1895.

(c) Messrs. Carter, Gummow, & Co., appear to have paid Mr. Weedon the interest on this £2,000 at the rate of £30 per quarter. The first payment appears to have been made by a cheque, drawn by Messrs. Carter, Gummow, & Co., dated October 1st, 1895, payable to "Cash," amount £30. The second quarterly payment of £30 was by that firm's cheque, dated 16th January, 1896, payable to "Interest." The first of these cheques appears to have been cashed in large notes, and the second one to have been paid into the credit of Mr. Weedon with the English, Scottish, and Australian Bank. I have not as yet identified the further payments to Mr. Weedon by Messrs. Carter, Gummow, & Co. I have carefully examined the Bank Pass-book of Mr. John Carter, who has drawn his cheques in favour of names, and have not discovered any payment to Mr. Weedon therein, nor is there an amount corresponding with a quarter's or two quarters' interest during the six months ending 30th June, 1896.

(d) My investigation of the accounts also shows that the whole of the payments for interest on the loans per Messrs. Billyard, Andrews, and Moseley, of £3,500, subsequently £4,500, extending from March, 1893, to April, 1896, were paid out of the accounts of the firms of Carter & Co., and Carter, Gummow, & Co.

GEO. CHRISTIE,  
F.S.A.A.

Sydney, 10th July, 1896.

8346. There can be no doubt in your mind from your investigations that the money of Mr. Weedon was used for the purposes of the firm, whereas Mr. Carter said that it was advanced upon his own security for his own purposes? The transaction shows that the money went direct to the firm's account, and the state of their banking account shows that the money was necessary—that they really required it. I inferred from Mr. Carter's answers to the questions he was asked the other day that he considered the transaction a private one. I think he said he gave personal security.

8347. Have you examined the transactions of Mr. Carter with Mr. Rudolph and Mr. O'Hanlon? I have the original records as to the searches I made in those matters.

8348. Are the loans in those cases from the firm, or from Mr. Carter as a private individual? The payments to Mr. Rudolph are by the firm. There is a cheque of April 19th, 1892, drawn in favour of Henry Rudolph for £250 upon Carter & Co.'s North Shore contract account, and a cheque under date of 26th May, 1894, drawn in favour of Henry Rudolph for £40 upon the account of Carter, Gummow, & Co., Contract 69. I have also papers which show that four of Mr. Rudolph's salary cheques were paid into the credit of Messrs. Carter, Gummow, & Co.

8349. Therefore the transaction, instead of being a private transaction, was one with the firm? It would appear to be so.

8350. In Mr. O'Hanlon's case, what was done? There were four cheques paid to Mr. O'Hanlon, and in each case from the account of Carter, Gummow, & Co., Contract 69. The particulars are as follows:— July 6th, 1894, £145; July 26th, 1894, £150; August 30th, 1894, £60; September 6th, 1894, a cheque drawn in favour of cash for £60. It was cashed in large notes and gold. From reference to the contractors' pass-books I find that it was chargeable to Mr. O'Hanlon.

8351. There can be no doubt that those transactions were with the firm and were not of a private nature? Yes.

8352. *Mr. Smith.*] Take a case of this nature—Suppose one of the members of a firm had a private account—it is not an uncommon thing, is it, for a partnership cheque to be drawn on the partnership account to meet a private liability, the individual partner being debited in the books of the partnership with that amount;—from your experience in dealing with partnership accounts can you say whether that is not a common transaction—a daily occurrence? Where there are properly kept books it would occur, but I should prefer to answer some specific question upon these points instead of answering general questions. For instance, if you could find a question upon any one of the cheques to which I have referred I should be glad to give you an answer relative to that cheque.

8353.

G. Christie.  
10 July, 1896.

8353. But is not a case such as I have just mentioned a common transaction? It may be a matter of arrangement between partners; but in this particular concern where there are so many partners, each having a specific monthly drawing, it could not occur to any extent, and I presume that in a case where each partner had a private banking account his private liabilities would be paid out of that account.

8354. But how can you say that these particular transactions could not be private matters simply because they went through the partnership books in the way you have described. Take, for instance, the transaction in relation to the £2,000? The trend of my report is that the firm at that time were needing money very badly. They had certain claims to meet, and the inference is that the money was required to meet those claims.

8355. Suppose such a state of things to exist, and suppose also that Mr. Carter said to his partners, "I have a private property upon which I am willing to borrow £2,000 outside of the firm; we have to meet certain liabilities during the next few months; I will put that £2,000 into the firm's account; as between myself and the borrower it is a private transaction; he will look to me only in the matter; so far as the members of the firm are concerned, I am to be credited with the £2,000; it is money brought by me into the firm's accounts, and the firm will pay the same interest to the borrower as I should have to pay myself";—suppose the transaction were carried out in that way; suppose that instead of the £2,000 going into the account of Mr. Carter, and his drawing a cheque upon his account, and paying it into the firm's account, a straight cut was taken by paying the cheque at once into the firm's account;—would it not be still a private matter? I am afraid I cannot follow the whole of your suppositions.

8356. *His Honor.*] The point is this—would it not be a short cut, instead of the roundabout course generally adopted in such cases? In this particular case the matter is very clear, and there is no supposition in it at all.

8357. You draw only one inference? Only one inference.

8358. *Mr. Gummow.*] Supposing this firm had an overdraft at their Bank, do you think the Bank would lend them money at 6 per cent. Not unless it were a large amount. I suppose it could be obtained at 7 per cent.

8359. Without security? With security.

8360. But I am speaking now upon the supposition that it would be without security? I could not say. I do not think a Bank would advance money without security, and at this particular time, if I am not mistaken, you had security lodged with the Bank.

8361. What security would that be? I think you will see, upon reference to the papers which have been handed in by the Bank, that at that time you had lodged securities with them.

8362. If there were no securities what would be the inference? I think the Bank would want the money paid up.

8363. That is the inference you would draw? Yes.

8364. Suppose the Bank would lend the money without security—do you consider that Mr. Carter, if he had £2,000, was taking an unwise course in his own interests, as well as in the interests of his partners, in lending the firm the money at 6 per cent.? I should think that if any one partner in the firm had money, and paid it into the firm's account with a view to reduce an overdraft, there would be some arrangement among the partners in regard to the transaction.

8365. Is not such an arrangement likely to be made? I could not say.

8366. What inference would you draw from the transaction? I should say that the money had been paid in with the knowledge of the other partners.

8367. Would it be beneficial to the interests of Mr. Carter's partners that he should do so? No doubt if it were his money it would be beneficial to his interests as well as to the interests of his partners that he should do so.

8368. I understood you to say that you thought the transaction could be carried out if there were properly-kept books, but could it not be carried out without any books whatever? I have very strong views upon the matter of books.

8369. Do you not think it would be possible for a member of a firm to lend his co-partners money without the existence of any books—would it not be fair to make allowance for a certain amount of honour and good faith as between the partners? Possibly, but the partner would stand the risk of losing the money if no proper record were kept.

8370. Are books the only bond between individuals who come together in business? They are not the only bond, but they save disagreement afterwards.

8371. Do you think business cannot be done, then, without putting everything down in black and white? I do not think your business could have been.

8372. If it were proved that it could have been, you would be wrong? I should like to see it demonstrated. Speaking of the rate of interest, is not Mr. Wheedon receiving more from you than he could from any other investment?

8373. *Mr. Parkes.*] Where partners draw regularly sums of money over and above their usual salaries, would it not be very difficult for an adjustment to be made without a proper set of books being kept? It would seem to me to be so.

8374. Take the account of Messrs. Carter, Gummow, & Co., the sum of £43 6s. 8d. appears to have been drawn regularly by Mr. Carter, Mr. Gummow, Mr. Snodgrass, and Mr. Forrest;—would not that denote that these gentlemen were partners in all the business of Messrs. Carter, Gummow, & Co.? It would indicate that. I might mention that Mr. Gummow's name does not appear continuously, as do the names of the others. But taking Mr. Carter, Mr. Forrest, and Mr. Snodgrass, they appear to have drawn this sum of money regularly from the firm's account. They commenced at £20 16s. 8d., I think, and they afterwards came up to £43 6s. 8d.

8375. And since 1894 they appear regularly to have drawn that salary? Yes. I have an extract from the books showing the drawings of the various partners, but it is not yet complete.

8376. But the regular salaries have been paid every month? Yes. Mr. Forrest, up to March, 1893, drew £20 16s. 8d. From that date throughout he has drawn at the rate of £43 6s. 8d.

8377. Out of the account of Carter, Gummow, & Co.? Out of the various accounts.

8378. Throughout this period various sums—sometimes £100, sometimes £20—have been paid to Mr. Forrest in addition to his drawings on account of salary? Yes, even sums of money, and the same with regard to Mr. Carter.

- G. Christie. 8379. These sums of money have been paid out of Messrs. Carter, Gummow, & Co.'s account? Yes.
- 10 July, 1896. 8380. And the same, I suppose, with regard to the other partners? Yes. All the payments to Mr. Carter, apart from salary, are even sums of money. There would be £20 or £100, as the case might be. There are no broken sums.
8381. Under these circumstances, in order to keep a proper adjustment of accounts as between the partners, books must have been kept? It is difficult to understand how any adjustment can have been made without a proper set of books.
8382. The bank-books denote that Mr. Forrest was a partner in all the firm's contracts? Yes; I should think so.
8383. *Mr. Gummow.*] Would it surprise you to know that a partner could tell how much the firm owed him, and how much he owed the firm, without any set of books? I hope that each member of the firm is in a position to tell what he is entitled to; but I do not see how he can arrive at it without books.
8384. Could he not arrive at it from the firm's bank pass-books? No.
8385. If I owed that firm £150, should I not know it, and would not the other members of the firm know it? There are certain necessary precautions which every man takes, and insists upon, especially when dealing with various classes of men, such as I understand your firm to have consisted of—that is to say, the members not being all of the same standing as yourself. It would seem necessary, in such circumstances, for the protection of the interests of some of the members that they should insist upon books being kept.
8386. You conjecture that they would insist upon it? Yes.
8387. But suppose that, allowing for the fact that all the members of the firm are not of the same standing, they have no disputes, and that no member considers that he is getting more or less than his share;—what would you say to that? I should say that it would be reasonable that at various times members of the firm should wish to make an adjustment of accounts. Any careful contractors would want to know the profits they had made on each job, if only by way of a guide to them for future tendering. It is a simple matter of business in all concerns. Each man naturally wants to know that he has had justice done to him. In the first place it would seem necessary that the cost and profit of each contract should be arrived at before each man can know what he is entitled to beyond his monthly drawing. The amount of profit having been ascertained, there is the distribution of profit to be considered.
8388. Supposing a partnership had been properly dissolved, and that the members had settled up all their affairs without the slightest dispute or unpleasantness, without the keeping of any books, what would you think of that? I do not know. There are certain circumstances in which a man is glad to take what he can get in order to save trouble and expense, and possibly equity suits.
8389. But suppose there is no dispute and no ill-feeling of any kind—suppose each partner takes a certain amount, not because he has to take it but because he is satisfied that he is being fairly treated in taking it—what would you say to that? I should say that there were very few such cases. They would be very exceptional.
8390. Then there is the question of Mr. Weedon's transaction—to whom did he lend the money? I am going simply upon the transaction as disclosed by the books at our disposal. I have not seen any deeds or documents, but it seems to me that the money must have been lent for the use of the firm.
8391. In whose favour was the cheque drawn? It is drawn in favour of No. 547.
8392. *Mr. Smith.*] I should like to know how you arrive at the quantity of cement which has been obtained by Carter, Gummow, & Co., from Parbury, Henty, for instance? From the returns furnished by that firm.
8393. Did you make an abstract of those returns;—did you make a note of them, or what did you do? I have kept all the papers which I have received from the various firms, but I do not produce them.
8394. How did you arrive at the totals which you have put into the report which you have read;—have you the papers upon which you arrived at those totals? Yes; but I do not produce them.
8395. Where are they then? They are in my possession, but I object to their production at the present time.
8396. *His Honor.*] You must produce all the documents by means of which you have arrived at your conclusions;—if cross-examination is directed to the mode by which you have arrived at them they must be thoroughly explained? I have endeavoured to make the information afforded in my report as explicit as possible, and I think I have afforded sufficient information to enable other persons to prove my figures for themselves. I have seen the ledger accounts of the various firms and the whole of their transactions during the time referred to. They have given me information as to the quantities which represent the amount charged in the accounts, and they have also furnished me with particulars of the delivery of those quantities. From this information I have compiled my report.
8397. I presume Mr. Smith would like to know the names of the individuals to whom you had recourse? In the case of Parbury, Henty & Co., Mr. Henty, junior, the resident manager, afforded me the information.
8398. *Mr. Smith.*] I understood you to say that you had been furnished with particulars from that firm, from which you had made up your returns, showing the total number of casks in that case;—that is the document I should like to see? I do not produce it.
8399. Have you it? It is within my control.
8400. *His Honor.*] I suppose you have taken a number of extracts from the account books of various firms, and that you have made up your report from them? Yes; the statement I have made is quite complete.
8401. *Mr. Smith.*] Upon what ground do you object to produce the documents which you say contain the figures upon which your report is founded? I am appearing here more particularly under the instructions of Mr. Parkes. That is my position.
8402. Have you any other reason for not producing them? It is not for me to say what is to be done with any papers which may be in my possession bearing upon this question.
8403. *His Honor.*] The papers are yours and no one else's;—you have full control over the whole of your own calculations? I take it that if I am employed by any person to make those calculations the papers will be theirs, and not mine.

8404. You are merely asked to give the simple data from the books upon which you found your calculations? The contractors were asked to prepare this very same statement, and they have had an opportunity to prepare it. They ought, as a matter of fact, to know more about their affairs than I do. G. Christie.  
10 July, 1896.
8405. *His Honor.*] Under the circumstances I must direct production of the papers? Of course that being so they will be furnished to the Commission.
8406. *Mr. Smith.*] I understand that in the case of Parbury, Henty, & Co. you saw Mr. Henty, junr.? Yes, and some of his subordinate clerks.
8407. Do you know who they were? A ledgerkeeper and his son. I think their name is Holden.
8408. Whom did you see in the case of Mr. Henry Austin? I saw Mr. Austin himself and his book-keeper. I do not know the name of the book-keeper or the clerk.
8409. Whom did you see in the case of Burns, Philp, & Co.? Mr. Alexander.
8410. And in the case of Mr. John Try? I did not, for certain reasons, visit Mr. John Try's.
8411. Did you get your returns from each of the persons you have named? Yes, except in the case of Mr. John Try.
8412. How did you arrive at your figures in that case? You will see from the report that I took the amount paid to Mr. John Try, and estimated the price at 9s. 6d. per cask.

Mr. John Carter recalled and further examined:—

8413. *Mr. Parkes.*] Apart from the merchants named in Mr. Christie's report, have you within the last four years purchased cement of any others? Those of whom we have purchased are Parbury, Henty, & Co., Henry Austin, Burns, Philp, & Co., and John Try. I think that is the lot. J. Carter.  
10 July, 1896.
8414. *His Honor.*] I understood you to say that the whole of the names appeared in your bank pass-book? Yes.
8415. *Mr. Parkes.*] What is the greatest stock of cement you have kept? I think we have had 5,000 or 6,000 casks in stock.
8416. What number have you in stock now? I could not tell you.
8417. Where do you keep your stock? Wherever we are at work.
8418. Where are you working now? At Baimain, on the sewerage contract.
8419. What is the street there in which you keep your cement? I am referring to the Johnstone's Creek works. The store is on vacant land.
8420. Near the aqueduct? Yes.
8421. Is the cement there in bags or in casks? In casks.
8422. Is that the only stock you have? We have another stock over at White's Creek on the same job.
8423. How many casks are there there at the present moment? I have not the faintest idea. I have not been there for a month.
8424. You do not keep such a stock, for instance, as 10,000 casks? No, we should not keep that quantity; but we have had quite 5,000 or 6,000 in stock.
8425. *Mr. Gummow.*] Do you know when the duty came off cement? Yes.
8426. Had you a large stock on 30th June? No. We wanted to save the duty of 2s. a cask.
8427. You did not get more than you absolutely required? Certainly not.
8428. *His Honor.*] Are there any other places besides the White's Creek and Johnstone's Creek aqueducts where you have any cement stored at the present time? No. I think I may go so far as to say that we have at times had as many as 7,000 or 8,000 casks stored on our various contracts. Sometimes we have had the cement 6 or 8 months before we wanted it so that we might get it tested and have it ready for use. That accounts for contractors coming to us to borrow cement. We were the only firm who had it. No one else had the pluck to get it.
8429. When you lent cement on various occasions, did you always get it back in the form of cement? No; sometimes by cheque, so that we are hopelessly mixed on that subject at present. I could remember what we received at the time of the transaction, but I could not remember now.
8430. Did you ever get any cement in respect of which payments would not appear in your bank books? No.
8431. Was any cement given to you in exchange for anything else which you had lent? No.

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George Christie recalled and further examined:—

8432. *Mr. Smith.*] In the memorandum you submitted the other day you told us that the total amount of cement purchased by Carter, Gummow, & Co., of Parbury, Henty, & Co., was 17,970 casks—how did you arrive at that total? First of all by an examination of their ledger account from 1st January, 1892, and obtaining a copy of all the details making up the total of each item charged to debit or credit. The ledger account included debits for purchases other than cement. These were separated, and a complete list was made out of the purchases of cement apart from other purchases. Messrs. Parbury, Henty, & Co. were then requested to supply certain particulars as to deliveries, and these were supplied. G. Christie.  
13 July, 1896.
8433. What were those particulars? Information which was not in the invoices they supplied. There were certain deficiencies in the particulars as to delivery.
8434. What were the deficiencies you speak of? They had not a record in their principal books of the whole of the information as to delivery.
8435. So that the whole of the 17,000 casks did not appear in their ledger account—is that it? The quantities were right, but certain inquiries had to be made as to the exact locality of delivery. The principal ledger did not show in all cases the exact locality.
8436. Although the ledger account showed the whole total of 17,970 casks it did not give you particulars to enable you to say to what places the cement was sent? No. The ledger would not show that.
8437. The same observation, I take it, applies to the other cases; the figures appearing in the first column of your table show the amount appearing in the ledgers of these four firms—is that not so? A ledger is an index to all the other books; practically it sums up all the other books. Starting with the ledger,

- G. Christie. ledger, you get a key to all the information in the books. The ledger gives a date and the total, and you have to go to the subsidiary books for the details. In some small businesses all the details are shown in the ledger, but in the case of a merchant's business the ledger is the key to the other books.
- 13 July: 1896. 8438. So that only the total quantity would appear in the ledger? Not in the ledger itself.
8439. Not the whole of it, do you say? It all depends. All debits would appear, the date and the amount of the debit. The date of any particular supply and the amount of it would appear in the ledger.
8440. But not the number of casks? No.
8441. So that all that the ledger would disclose would be the total amount charged against the firm? Yes.
8442. And you say you have to go to the other books and to the invoices to get at the number of casks—is that so? Yes.
8443. Did you get from Parbury, Henty, & Co. a list of invoices? Yes.
8444. Have you it with you? Yes.
8445. Will you hand it in? I do not do so at present. I would rather leave that for future discussion.
8446. At all events you have a list of the various invoices? Yes.
8447. Did you get the invoices themselves of which you have the list? Yes. What I now hand you is the copy from Parbury, Henty, & Co.'s books, made by their own staff.
8448. This document purports to be a copy of the invoices? Yes.
8449. In full? Yes.
8450. It is not merely an extract from invoices, it is a copy of each invoice? Yes, of all the essential points. There may be some little item in the invoices which would not appear—matters, for instance, which they may have put down for their own information.
8451. *His Honor.*] As far as you know it is a copy of the account of the firm with Carter, Gummow, & Co., and covers everything? Yes.
8452. *Mr. Smith.*] Are the marks in red ink against some of the items made by you? No.
8453. What is the meaning of the marks in red ink? They are in the handwriting of Parbury, Henty, & Co.'s clerk.
8454. Do the red marks purport to be a copy of what is in the invoices? No.
8455. They have been added since the invoices were made out? That which appears in black ink is on the face of the press copy of the invoices. The writing in red ink has been added.
8456. So far as the invoices themselves go, as they stand there is nothing to show to what particular contracts these particular quantities of cement went? It appears in many of the invoices, but not in all. This is not my writing. It is information furnished by the firm at my request. They furnished the documents as they appear in black ink in the first instance, and I pointed out to them that that was not enough and that I required other information. The additional information appears in the red ink. In some cases the details appear in the invoices.
8457. Can you show me from the items the number of casks which make up the total of 4,300 which are alleged to have been sent to the North Shore contract—have you any list showing that? Yes; I have a detailed list.
8458. It refers to the invoices, I suppose? Yes; the number of the invoice is given for identification.
8459. And the statement shows how you arrive at the 4,300 casks which were supplied to the North Shore contracts? Yes.
8460. And it also shows how you arrived at the number supplied to other contracts? Yes; the one statement supplies the whole of that information.
8461. It is founded upon the invoices with the additional information supplied by Messrs. Parbury, Henty, & Co. since the invoices were made out? Yes.
8462. I do not know whether I quite understand how you have arrived at the 1,200 casks supplied by Mr. John Try. You say that the whole of this cement went to the Annandale and Leichhardt contracts? Yes.
8463. How did you arrive at that conclusion? For certain reasons the books of Mr. John Try were not asked for, and the information regarding the purchases from him are based upon the payments to him as disclosed by the Bank passbooks and the cheques mentioned therein. I have a list of these payments, making a total of £588 6s. According to the contract, Mr. John Try was to supply the cement at 9s. 6d. a cask.
8464. Was there an agreement in writing? Yes; I have referred to that, and I have the information definitely, so that in taking a liberal calculation—that is to say, 10s. a cask—I put down the number at 1,200. That is a very liberal calculation, indeed.
8465. What was the nature of the agreement—was Mr. Try to supply so many casks a month? I have not seen the agreement itself, but I obtained certain information in reference to it, and from this information I ascertained that 9s. 6d. per cask was to be paid for the cement delivered at Annandale.
8466. Did the agreement specify any particular contract? I could not say that it specified the contract, but you will see from the return that there were two contracts in the neighbourhood of Annandale, and they are included in one column in my statement.
8467. The Annandale and Leichhardt contracts? Yes.
8468. And you arrive at this total in that way? Yes; it is calculated simply upon the amounts paid to Mr. John Try.
8469. With regard to the 1,402 casks obtained from Henry Austin and the 1,000 casks obtained from Burns, Philp, & Co., you have corresponding lists of invoices? Yes; I have the same particulars in the case of Burns, Philp, & Co. and Henry Austin.
8470. Where did you get the information, in the case of the supply of cement by Burns, Philp, & Co., as to the places to where the casks were sent? The items in the case of Burns, Philp, & Co. were furnished to me with the copies of their ledger in the form of an account current, and after eliminating certain items which do not come within the period, there is only one item in which we are concerned. That is dated 14th July, 1893, the amount being £487 10s., represented by 1,000 casks of cement, for which the invoice is produced.
8471. But why do you come to the conclusion that it went to North Shore? Because it is invoiced to Carter & Co. at North Shore; and in the second place because they required that quantity of cement to make up the total amount on which they obtained the advance referred to in my memorandum.

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8472. And this, you say, is the only invoice that is material? Yes.
8473. The invoice dated 23rd June, 1892, shows that 118 casks of cement were sent to Carter & Co., Shea's Creek? Yes.
8474. On 7th July, 1892, 109 casks were returned? Yes.
8475. On 17th May, 1893, 750 casks were sent to Carter & Co. at North Sydney? They were destroyed in the course of delivery. The punt caught fire, and it being necessary to deluge it with water, the cement was spoilt.
8476. These are all the items relating to cement, all the invoices for cement that you can find in Burns' Philps' books for that period? Yes.
8477. As to Henry Austin's account, you produce a copy of the ledger account, and it contains two items to Carter & Co.—July 15th, 1893, 400 casks, and July 24th, 1893, 1,002 casks? Yes.
8478. And these make up the 1,402 casks mentioned in your return? Yes.
8479. Have you the invoices relating to those? These are the invoices I obtained relating to that case.
8480. How do you know the cement went to North Shore? In the same way as in the other cases.
8481. How is that? From the dates, and from the fact that it was the only contract which Carter & Co., had at the time.
8482. What do you say to the item of 619 casks on 30th April, 1892? That the cement was delivered to Gummow and Gillan.
8483. You do not know what became of it? No; I had nothing to do with that.
8484. On the same date—that is, April 30th, 1892—there is an item of 967 casks;—what do you say as to that? That it was sent to Shea's Creek.
8485. On May 7th, 1892, there is an item of 994 casks;—what do you say as to that? It went to Shea's Creek, according to the invoices.
8486. On the 23rd May, 1892, there is an item of 184 casks? It is not stated definitely in the invoice where it was sent to, but it evidently went to Shea's Creek.
8487. On 11th July, 1892, there is an item of 331 casks? That was delivered to Gummow and Gillan.
8488. On 11th August, 1892, there is an item of 409 casks? Yes; delivered at Waverley.
8489. And all those items are excluded from your return? Yes. Of course you will understand that in dealing with this matter of cement, the dates were in my possession on which Carter & Co. obtained their Contract No. 79, after the stoppage of No. 72 Contract. They were then, as far as I can judge, finishing the Waverley contract, but Contract 79 was practically the only contract they had to go on with, and they do not require cement until some time after they have started a contract, because they have to get down the shafts. These various points have to be considered when you are dealing with the question of cement.
8490. From March, 1891, to November, 1891, there were large purchases of cement by Mr. Carter? Yes, for various contracts.
8491. On 12th February, 1892, for instance, there is an item of 175 casks? Yes; delivered to the Glebe.
8492. And on 20th February, 1892, an item of 464 casks? Yes; delivered at Waverley.
8493. And on 18th February, there is an item of 464 casks? Yes; delivered at Waverley.
8494. On 22nd April, 110 casks? Delivered at Waverley.
8495. Those are all the items which appear in connection with the account with Henry Austin? Yes; all that refer to my return may be summed up in two invoices—that is to say, the invoices of July 15th, 1893 and July 24th, 1893. The others all have reference to contracts prior to Contract 79.
8496. Those are the only items out of all those appearing which you put in your return? Yes; because they are not connected with Carter & Co.'s Contract 79, 79A, and 69. The items represent other cement which did not go into those contracts.
8497. In the list of invoices which you received from Parbury, Henty, & Co., are there any items which are not included in the 17,970 casks? No; the whole of them are included.
8498. All those invoices are included? Yes; because the transaction with Parbury, Henty, & Co. was in connection with the supply of cement to the North Shore contract, and the finishing of the Waverley contract. It is pretty clear I think that a little cement was required to finish at Waverley, and then they went straight on with the work at North Shore.
8499. *Mr. Gummow.*] You have had copies of invoices from Burns, Philp, & Co.? Yes.
8500. Have you copies of invoices from Henry Austin? Yes.
8501. Were these copies made by the firms themselves? Yes.
8502. Did Parbury, Henty, & Co. make out the copies you have in their case? Yes.
8503. They were made by one of their staff? Yes.
8504. You are quite sure of that? Yes.
8505. Did the firm guarantee them as correct? They are prepared to attend, and swear that they are correct.
8506. They told you that they were absolutely correct? Yes.
8507. And as to the deliveries of these different quantities of cement, do they guarantee those as correct? Yes.
8508. In each case? Yes; whatever is stated in their documents.
8509. Are the statements as to the delivery of cement guaranteed by the firm, or are they only your own statements? I think in the case of Mr. Henry Austin's deliveries, the cement went into lighters as stated in the invoices. I made searches which show that it went to North Shore.
8510. But did the firm give you particulars of the delivery definitely? Yes; other than in the case of Henry Austin, and that was clearly delivered at North Shore.
8511. Do you know whether the cement delivered at these different places was used upon the works there? My report does not go into that matter at all.
8512. Do you know whether Carter & Co. in buying cement bought for particular contracts, or on a large scale for future use? I could not say as to that.
8513. Have you seen any of their contract notes? No; but I have seen information gathered from the contract notes.
8514. Do you know how much cement Carter & Co. had in stock prior to 1st January, 1892? Where?
8515. Anywhere? That would be shown upon the certificates upon which they obtained advances, I presume.



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8516. But what had they in stock previous to January, 1892? I should say that you had none, because you made such petty purchases to complete other contracts that you had. I should argue from that that you could not have had any stock.
8517. That is the inference you draw? Yes.
8518. You said you had checked everything, and that you had no doubt that your audit was perfectly correct? Yes.
8519. That is the case, is it? Yes.
8520. As to these advances upon cement, let me refer you to the Parliamentary papers. In your memo. as to advances on cement made to Carter & Co. upon Contracts 79 and 79A you refer us to page 360 of the Parliamentary papers as to the Department's rule in regard to advances, viz., "75 per cent. of value up to 75 per cent. of contract deposit";—will you show me that paper? The wrong page is given. It should be page 366.
8521. Do you know whether it is the rule of the Department to give this advance? If you will refer to page 366 you will find the following minute by Mr. Davies:—
- The contractors have been asked that an advance be made on approved cement on this contract. It is usual for this to be done, and I recommended that the request be complied with to the extent of 75 per cent. of the amount of the fixed deposit (£485), at the rate of 75 per cent. of the value of the cement on the ground, on condition that the contractors sign the usual agreement.
- That passed through various officers. It was approved by Mr. Hickson, and was referred to Mr. Davies, and sent on by him to Mr. Norrie.
8522. What does the agreement upon page 367 say? It runs as follows:—
- In consideration of the Minister for Public Works in and for the Colony of New South Wales advancing to us the sum of £485, and of any future advances to be made to us, we hereby agree to repay to the said Minister for Public Works the said sum of £485 and future advances.
8523. That refers to future advances as well as to the £485? It contains the usual condition in any mortgage.
8524. But does the agreement mean anything;—what is meant by it? The minute which I have quoted was noted by various officers, going on finally to Mr. Hungerford; and I suppose it is intended to convey the information that no greater advance than that specified should be made; but more has been advanced.
8525. But what is the meaning of the term "and future advances"? I take it that the use of that language only fixes the amount more definitely.
8526. But it does not prevent the Department from making advances over and above £485? If it be necessary to go through the whole of this formula in reference to the advance of £485, I presume that any increase upon that amount could not be made without the same formula being gone through.
8527. Further on in your report you say: "Contract 79A. Contract deposit, £485. The amount advanced exceeds 75 per cent. of deposit, £485, viz., £360"? I believe that is the amount.
8528. Do you know the amount of the deposit in the case of 79A? I have taken the percentage to be upon the £485.
8529. Does not the minute say, "I recommend that the request be complied with to the extent of 75 per cent. of the amount of the fixed deposit (£485)"? I now see from the other documents that the deposit is £650. I accepted as correct the amount in the minute, viz., £485.
8530. You clearly made a mistake? Well, there would appear to be a mistake in the minute.
8531. Would it make a difference in your statement? I had better say exactly what difference it would make. It will make a difference of £125 in the items referred to in the last paragraph. It will reduce each of the four sums of £296 to £171, and it will reduce the amount of £179 to £54. It will make an over-advance of the amounts which I now state upon those five different certificates. The amount of £15 in the paragraph disappears.
8532. As regards the value of cement on the ground, how do you arrive at it? I think I have been liberal in putting it down at 11s. 6d.
8533. How did you arrive at that price? The price at which the cement was purchased was 9s. 9d., and I am allowing the most expensive mode of delivery.
8534. What do the schedule rates for any contract accepted by the Department say;—do they not provide for payment upon material delivered by the contractors? Yes. To what items do you refer?
8535. I refer to the item for cement? The price quoted for the supply by you of a dozen casks of cement was never intended to apply to an advance upon the whole stock of cement. Besides, anyone advancing upon cement would naturally advance upon the cost. You supplied about twelve casks ultimately at the price named in the schedule, viz., 16s., but an advance would, as a rule, be upon the cost of the goods to the person holding them.
8536. Would not the 75 per cent. advance be upon the schedule rate in just the same way that the 90 per cent. advance upon work done would be at schedule rates? I can only repeat what I said—that 16s. was intended to be the price for a few casks, which you might have to deliver to the contract as cement, but if the Department were requiring 1,000 casks of cement they could be purchased at less than 11s. 6d. a cask.
8537. The point is this: If the Department make an advance at all, would it not be to the extent of 75 per cent. upon the schedule rates? I had no intention of being present this morning as a witness, and I have not with me the papers referring to this particular matter.
8538. The point I wish to bring out is this: That there is a certain schedule price for cement, and in the lending by the Government of 75 per cent. upon cement, the value of that cement would be the value set down in the schedule? I could not agree with that conclusion. No matter what the contract price would be for a small quantity, it does not follow that the Government are expected to lend at that same price upon 2,000 or 3,000 casks.
8539. Do you think the Government have lent money upon that basis? Yes.
8540. And you do not agree with that course? No. I have referred again to certificate No. 17, and I find that it substantiates fully what I stated in my memorandum. The certificate shows that the cement was valued at the rate of 16s. a cask to the amount of £2,160, and that you received 100 per cent., and that there was not the usual deduction of 10 per cent. for contract work. The Government advanced you 16s. a cask upon the cement.
8541. Sixteen shillings a cask is the price appearing in the schedule? Yes; but it was not intended that you should supply 3,000 casks of cement at that price.
- 8542.

8542. Is it not greatly to the advantage of the Government to make this advance upon cement? In what way. G. Christie.
8543. By obtaining more competition, by assisting contractors financially? I think the Government are really destroying the security they have by making an advance upon it. 13 July, 1896.
8544. But are they not getting their work done more cheaply by assisting competition? I do not think so. I do not think it is of any benefit whatever to the country. It would be much better in the interests of the State to have stable contractors who would not require these advances, contractors who on entering into these works were able to finance themselves. No good Government would take off 10 per cent. from the work and then advance £2,000 upon cement. That is not business at all.
8545. But does it not assist competition if a tenderer knows that he can obtain financial assistance from the Department—take the case of a tenderer who, if he had not that assistance, could not afford to tender? With reference to the specification and your statement that the Government did authorise this advance upon cement, I suppose the only matter which would influence a tenderer if he studied the specification would be a clause stating that he was entitled to the advance.
8546. *His Honor.*] What you mean to say is that if there were a condition in the specification permitting the advance it is right to assist the tenderer; but that otherwise you do not think it would be so? Quite so.
8547. *Mr. Gummow.*] Will you look at page 120 of the Parliamentary papers; look at the last two lines of clause 34 of the general conditions—does it not show that contractors can get an advance upon material on the ground and not in position? That is not in the specification in the case of Contract 79 with which we are now dealing. That is a new specification.

George Edward Hudson sworn and examined:—

8548. *Mr. Parkes.*] You are a contractor? Yes. G. E. Hudson.
8549. In 1891 you were allied in your business with another gentleman named C. B. Bond? Yes. 13 July, 1896.
8550. Who is Mr. Bond? A commission agent, carrying on business in Sussex-street.
8551. Is he a builder? No.
8552. Is he a financial agent? He was a commission agent; he has now retired from business.
8553. Was he a man of means? I suppose so; he was supposed to back me up through any work I got.
8554. He found the money and you found the experience? He found the money and I had to do the work.
8555. Do you recollect tendering for Contract 79—I mean the contract in Alfred-street, North Shore? Yes.
8556. You and Mr. Bond were the lowest tenderers? Yes. [*Vide Appendix No. 32.*]
8557. Did you not wait for a considerable time for the acceptance of your tender? Yes.
8558. For how long? Three or four months.
8559. Not longer? I could not swear to the time now. I fancy that it may have been longer, but I would not swear to any time. I remember coming to the Department on several occasions, and asking them when they were going to start the work.
8560. When your tender was not finally accepted, what did you do—did you come to the Department? Not afterwards.
8561. I mean when you found that there was delay in the acceptance of your tender? I came and asked them if they were not going to give me the job, and they said they were not likely to go on with it for two years.
8562. Who told you that? Mr. Piper, I think.
8563. Where did you see that gentleman? In the Department.
8564. In what part of it? I could not say.
8565. Was it in the tender board-room? I could not swear.
8566. Was it in the big room in the front of the building? I saw a good many persons about the getting of my money; but I think it was Mr. Piper who told me that I could, by writing, get my money back without prejudice.
8567. What did you take him to mean by that? I took him to mean that we could put the money up at any future time.
8568. And you left with that understanding? Yes; we wrote for the money, and got it back.
8569. Who wrote? Mr. Bond did all my correspondence. I told him that if he wrote for the money he would get it.
8570. When you wrote for the money, was it your intention to relinquish the contract, and not to take it up? No. I had to pay Mr. Bond 9 per cent. for the money. That was the amount he charged for any money which he advanced for works. I think £369 was the amount of the cheque paid to the Government, and when the Department told me that they were likely to be two years before they went on with the work, I naturally wished for the money back again, because I did not want to pay 9 per cent. upon it for the two years. Mr. Bond wrote for the money, and he told me afterwards that he got it.
8571. Did you understand that he was to write, relinquishing the contract altogether? No; I did not know that.
8572. You continued to anticipate that you would have the contract until you saw something in the newspapers, did you not? Yes. I remember one evening my boy saying to me, "Dad, did you see they were going to call for fresh tenders for the North Shore job?" I said "No," and he said, "Well, it is in the papers." I saw in the newspapers the next morning, at breakfast time, that the Minister had given the job to Carter & Co., on account of their agreeing to forego some claim in connection with the Shea's Creek contract.
8573. During all that time you had been expecting Contract No. 79? Yes.
8574. Would you be surprised if you knew that Mr. Bond—after your conversation with him—wrote, upon the 28th September, 1891, in the following terms, to the Department?—

*In re Contract No. 79, Sydney Sewerage Works.*

Dear Sir,

88, Sussex-street, Sydney, 28 September, 1891.

On 10th June of this year, we had the pleasure of submitting a tender for the above works, and, we believe, were successful in being the lowest tenderers.

We

G. E. Hudson. We have been anticipating the acceptance of our tender for some months, but not hearing from your Department, we have, in the meantime, entered upon other obligations, and must consequently respectfully ask you to permit us to withdraw our tender, and to return us the deposit attached thereto now lying in your hands, viz., £369.

13 July, 1896.

We are, &c.,

C. B. BOND

(Bond and Hudson).

I never heard of that letter before. I did not know at that time what letter Mr. Bond wrote. I simply told him to withdraw the money, as I could not be paying interest upon it.

8575. You did not know that he was going to withdraw the tender as well? No; I understood that he was going to withdraw the money.

8576. And that, ultimately, you were to go on with the contract? Yes. If the Government had called upon us to put up the money again, to go on with the contract, we should have done so. That is what I understood.

8577. Had you any communication at all in writing, or by word of mouth, with Mr. Hickson about this contract? No. I have only spoken to Mr. Hickson once or twice, and that was in connection with a contract for water-pipe laying.

8578. Did you know of the existence of the following letter from Messrs. Carter & Co. and Messrs. Gummow and Gillan to the President of the Tender Board?

Sir,

Sydney, 10 June, 1891.

We have the honor to enter our protest against the acceptance of the tender of Messrs. Bond and Hudson for Contract No. 79, North Shore sewerage, on the following grounds:—

1. That the tender of Messrs. Bond and Hudson for Contract No. 56, Potts' Point sewerage, was accepted by your Board and not taken up by them,

2. Upon fresh tenders being called the tender of Mr. G. E. Hudson was the lowest, but was not accepted by the Board, in accordance with their rules and regulations.

Upon these grounds we, as tenderers for the North Shore sewerage, beg to protest against the tender of Messrs. Bond and Hudson being now accepted.

We have, &c.,

GUMMOW & GILLAN.

CARTER AND CO.

I know nothing about that. I know that we did tender for the job in Victoria-street.

8579. Will you tell His Honor how you came to throw up the job? We tendered for the job in Victoria-street £3,000 or £4,000 lower than the price of the next tenderer to us.

8580. Who were the next tenderers? Gummow and Gillan; I cannot be positive, but I am almost sure that we had an amount of £120 in with the tender. Looking at the fact that we were a good bit below the next tenderers, I thought there might be something more in the work than I anticipated, and that it would pay us to throw it up although there would be a loss of £120. I told Mr. Bond so, and he pointed out that the loss was considerable. I said to him that while there was one brick over another in my house he could hold it as security against any loss. I told him I thought it would be better to let the job go and tender for it again. I afterwards did so, on behalf of Mr. Bond as well as myself, but he was not at home at the time, and I did not put in his name. Mr. Bond was on the Richmond at the time, but he had left a signed cheque to be put in with any tender, and his son had directions to fill it in. When Mr. Barling was reading over the tenders in the board-room he read out, I think, Hudson as the lowest tenderer, but it was determined that as I had previously thrown up a job the Department would not accept it.

8581. Who got the contract? Messrs. Carter & Co.

8582. They carried out No. 56 Contract? Yes.

8583. Did you look upon Contract 79 as being a losing or a profitable contract? I was satisfied with my prices.

8584. What did you expect to make? I thought about £5,000. I am not an educated person. I am a practical man, and I knew what I would get per yard for driving, and upon that I made out my calculations.

8585. Did you receive any indication at all from the Department after your tender had been sent in that it had been accepted? I do not remember.

8586. Did you see any officer of the Department about the acceptance of your tender for the North Shore Contract? Only when I came, as I have told you, about the return of the money.

8587. But not before that? No.

8588. Do you know whether Mr. Bond did so? I do not know. All my communications with the Department by letter were carried out by Mr. Bond.

8589. Did he put up a deposit anywhere in connection with the carrying out of the work—did he put a deposit in any bank? I remember some money being put in the English, Scottish, and Australian, Chartered Bank, but whether it was for the Victoria-street job or the North Shore job, I am not sure.

8590. What was the amount? It was about £2,000, I think. I think arrangements were made for the money with the English, Scottish, and Australian, Chartered Bank.

8591. Did you know any other officer of the Department besides Mr. Piper? No, I cannot say that I did. I saw a good many, but I do not know their names. I was a perfect stranger in the Department at the time.

8592. You know where the tender-board room is? Yes.

8593. Did you ever speak to the clerk in the board-room? You mean Mr. Mitchell—yes. I went often down to him to get back the amounts which we had put in with other tenders.

8594. Did you speak to him about the contract? I could not say now.

8595. Therefore the only intimation you had as to the acceptance or rejection of your tender was through the newspapers? Yes; I saw from the newspapers that Carter & Co. had the job.

8596. In the meantime you were under the impression that you would get the work, although it might be hung up for two years? Yes; they told me two years might elapse before it was proceeded with.

8597. *Mr. Smith.*] Who is Mr. Bond? Mr. Chapman Bonnard Bond, of Sussex-street.

8598. What is he? He was a commission agent. He has retired from business now, and it is being carried on by his son.

8599. Did you enter into partnership with him? There was no written partnership. I worked for him at first as a licensed drainer, and I gave him satisfaction on some private job. Afterwards I got a contract under a son-in-law of his, a Mr. Kenwood. I also completed that work to his satisfaction. Then I tendered for a job with a man named Chandler to do all the water-pipe laying in the city of Sydney. I went to Mr. Bond and asked him to become a bondsman, and he did so. 8600.

G. E. Hudson  
13 July, 1896.

8600. For a consideration? I put £100 in his hand as security that he would not lose anything.
8601. Did he get a share of the profits? He got interest upon any money which he lent to me for the carrying on of the works. He got 10 per cent. at that time. After that Chandler took to drinking hard, and Mr. Bond would not lend me any more money while I had any connection with him. I therefore had to dissolve partnership with him. Mr. Bond lent me money until that job was finished, and as soon as it was finished we tendered for work under the style of Bond and Hudson.
8602. So that there was no general deed of partnership? No. Mr. Bond was always secured because all the vouchers were payable to him.
8603. You were partners in respect of any particular contract you took up together? Yes. I used to get wages every week from the day the job started until the day it was finished. When the last man was sacked my wages stopped.
8604. How did you share your profits? We divided them equally after Mr. Bond had taken 9 per cent. for the money advanced.
8605. I suppose you looked to him to manage all the financial part of the business? Yes.
8606. You left that entirely to him? Yes.
8607. After you had sent in your tender for Contract 79, and it was not accepted, did you enter into any other contract with Mr. Bond? Since then we have done a job at Parkes.
8608. But you have not gone into any other job with him since then? We did a job at Devonshire-street under the Water and Sewerage Board.
8609. Can you remember any other partnership contracts? I am not sure whether some of these were before or since the job you are referring to. For instance, there was the job from the Ryde pumping station to the Chatswood reservoir.
8610. Is that a big work? It was a job of over £8,000.
8611. I think you said that you had a talk with Mr. Piper about the return of your deposit? Yes.
8612. What made you go to him about it? I wanted to find out where I ought to go.
8613. You came to the Department to know what they were going to do with regard to this particular contract? Yes.
8614. And you say you saw Mr. Piper? Yes.
8615. Before you went to see Mr. Piper did you see Mr. Bond? Of course.
8616. And what did you arrange with him? He told me that I should have to pay interest on the money if we did not go on with the job.
8617. Did he tell you to find out how the thing stood? Yes. To see when the job was going on. He pointed out that if we did not get back the deposit money I should have to pay the interest on it.
8618. After you had seen Mr. Piper did you see Mr. Bond again? Yes; I was always in communication with Mr. Bond. I told him to write for the return of the deposit, and he did so. I never saw the letter that was sent.
8619. Did you not generally see the letters which were written for the partnership? No. I never bothered my head about it. I simply told him to write a letter and get the money.
8620. You left the whole thing to Mr. Bond? Yes. He did all the financing.
8621. And now it turns out that Mr. Bond wrote a letter withdrawing the tender absolutely? Yes.
8622. You did not know that? I cannot say I did. I never before saw the letter to which you refer, and I never heard it read.
8623. Who drew the money when it was returned by the Department? Mr. Bond, I suppose.
8624. You do not know whether you got the money back or whether Mr. Bond got it back? I asked him to go to the Treasury after the money, and I do not know whether he did so or whether it was paid into an account. If it were paid into a bank, I suppose it would have been paid into Mr. Bond's account.
8625. As to the Potts Point sewerage work, Contract 56, you tendered for that work? Yes.
8626. I suppose you knew that there were certain rules and regulations of the Department attaching to all tenders? Yes. Of course I read the specification.
8627. One of the clauses is that if you make a default or forfeit a deposit you are afterwards excluded from competing—is not that the effect of clause 14? I think there is a clause to that effect, but I do not know the number of it.
8628. It was on account of that clause that you were not given the contract to which you have referred, I suppose? I did not expect it altogether; I did not expect to get it.
8629. *Mr. Gummow.*] Did you get back the deposit you made in connection with Contract 56? Yes; I got it back during the Dibbs' administration.
8630. *His Honor.*] How long afterwards would that be? It must have been two years afterwards. I know that I applied for it when Mr. Bruce Smith was in office, and he would not give it to me. They did not know enough of me in the Department. Some time afterwards, when Mr. Dibbs was in office, I applied for the money, and I then succeeded in getting it back.
8631. On what date was that? I have no idea.
8632. But it was two years afterwards, you say? It would be about that, I think.
8633. *Mr. Gummow.*] You say that Gummow and Gillen were the next tenderers to you upon Contract 56? Yes.
8634. Did you expect that they would get the work after you threw it up? I thought it very probable that they would. Sometimes the contract was given by the Department to the next tenderer, and sometimes fresh tenders were called for. In this case they called for fresh tenders.
8635. Would it not have been fair play to give it to the tenderers next to you? I thought that would be done. I should not have thought there was anything wrong about it.
8636. When tenders were called for the work again Carter & Co. got it? Yes.
8637. Do you know whether their price was more or less than Gummow and Gillen's first tender? That I do not know, but I think it was lower than your first tender.
8638. You threw up the contract because you thought you would probably make a loss upon it? I did not think we should make enough on it.
8639. You did not think you had a good enough price for the work? Not when I saw the other tenderers so much above me.
8640. In the case of Contract 79, you were £3,000 below the next tenderers? Yes.

- G. E. Hudson. 8641. Did you know anything more about that class of work than you had known previously? No, I cannot say that I did. I had not much experience.
- 13 July, 1896. 8642. You had not done any work in the meantime? I had done some work under the Water and Sewerage Board.
8643. But tunnelling work I mean? There were a few chains of tunnelling on the work I did on the Challis estate.
8644. You thought you might make about £5,000 out of the North Shore contract if you got it? Yes.
8645. How did you arrive at that estimate? I cannot go into it now. The thing happened a long while ago. I know that Mr. Bond asked me, as he always did, what the profit would be, and I remember that I worked it out at about £5,000. I must have had someone to work it out with me for his satisfaction.
8646. Did you base your tender upon what you knew of the other tenderers? No. Every item was separately worked out not only by myself but Mr. Bond's son-in-law.
8647. Do you know who got Contract 79? Carter & Co.
8648. Not Carter, Gummow, & Co.? That I do not know. It is rather a fine distinction.
8649. *Mr. Smith.*] When you did hear that Mr. Bond had written in this way withdrawing the tender did you say anything to him? No.
8650. Did you protest against his having done so without your knowledge? No.
8651. You said nothing at all; you simply accepted whatever Mr. Bond did? Whatever Mr. Bond did in that line was binding upon me. I had thorough confidence in him.
8652. *Mr. Parkes.*] Have you not heard of this letter for the first time to-day? Yes.

John Carter recalled and further examined:—

J. Carter.  
13 July, 1896.

8653. *Mr. Parkes.*] Before you received Contract No. 79 at North Shore had you any conversation or arrangement with Mr. Hickson, or had you any conversation with him before you paid to Mr. Bond £750 to drop his contract? Not the slightest.
8654. You had no conversation at all with Mr. Hickson? None at all. I did not know him at that time.
8655. Was it about the period of Mr. Bond writing this letter that you gave him £750 to relinquish his tender; that would be about 18th September, 1891;—was it at that period? At about that period I presume, but I do not remember the date.
8656. At the same time did you pay a sum of money, namely, £200, to Mr. Bond's son-in-law, Mr. Kenwood? That I could not tell you. I had some dealings with Kenwood & Co. over the Silkstone railway and other contracts.
8657. Did you not on 23rd March pay a cheque for £200 to Mr. Kenwood for arranging matters with Mr. Bond? Yes; I paid him that sum. He had a lot of trouble in the matter.
8658. Upon the 9th October, 1891, the Minister instructed the Engineer-in-Chief to re-call for tenders for this work, did he not? I could not tell you.
8659. On 22nd February, 1892, at all events, a notice was sent to the *Gazette*? I believe that was about the time the matter was re-advertised.
8660. Had you any knowledge of the fact that it was to be re-advertised—did it come to your knowledge? Not that I am aware of.
8661. How came it then, that Mr. Hickson upon the next day—that is 23rd February, 1892—wrote as follows:—

Since writing my minute of 6/10/91, complications have arisen with Carter & Co., *re* their Contract No. 72 having been stopped. They have made large claims on this account, some of which no doubt could not be entertained, but on some items they have made a good case. They are prepared, if they obtained this work, to waive all claims on No. 72. As their tender is a reasonable one, and some £3,600 below the estimate, I think it might fairly be accepted. If this course were adopted, work would be given at once to a large number of men.—R.H., 23/2/92. Under Secretary. Important.

? I could not say.

8662. When did you put in the claim which has been referred to in connection with Contract 72? The papers are here, and I daresay if I referred to them I could give you the date.
8663. Did you between the 22nd and 23rd call upon Mr. Hickson? Possibly.
8664. Had you any conversation with him? Certainly, if I called upon him.
8665. Do you not remember whether you called on him with reference to your claim? Certainly I did; but I do not remember the dates.
8666. Was it after you heard that there was to be a *Gazette* notice? I did not hear of it, and I have already said so. I may have called upon Mr. Hickson repeatedly on various businesses.
8667. But did you have any chat with Mr. Hickson as to the nature of your claim? No. Mr. Hickson would not discuss it with me. He repudiated it entirely. That minute of his which you read has until recently been news to me. I did not know his opinion on the subject.
8668. In connection with Contract 72, I believe the claims referred to consist of these items:—"Rent of Knight's paddock, £10; sandstone for concrete, broken and stacked, £400; Portland cement, £958 15s.; loss on sale of cement, £250; gratings, £87 10s.; manhole covers, £30; interest on expenditure, £64 4s. 6d.; valuation of plant on ground for completion of contract, £500; loss on profit on work withdrawn, £1,750—making a total of £4,050 9s. 6d."? Yes. [*Vide Appendix No. 33.*]
8669. What was the date of that claim? 15th February, 1892.
8670. The date of your obtaining this contract is 23rd February, 1892, so that the two dates are very close? Yes.
8671. How long before you sent in your claim had the work upon Contract 72 been stopped;—had it been stopped six months? Possibly.
8672. You sent in your claim upon 15th February, and on 23rd Mr. Hickson wrote his minute? Yes.
- 8672½. Is it not a fact that Contract 72 was re-started within a fortnight after the matter in connection with Contract 79 was settled? I do not think so; but it may have been. I know that it was re-started, but how and when I cannot say.
8673. On 12th October, 1891, Mr. Hickson stopped the contract? Yes; I believe that was the date. [*Vide Appendix No. 34.*]
8674. And in April, 1892, you re-started it? Yes.
8675. When you re-started Contract 72 did not this entire claim of yours disappear? Not necessarily.

J. Carter.  
13 July, 1896.

8676. Take the rent for Knight's paddock—would not that disappear? No.
8677. Take the sandstone for concrete, £400—would that be used? Yes; certainly.
8678. Take the Portland cement—would that be used? Yes.
8679. Then there is loss of sale upon the cement,—would that be lost? Yes; because I had bought cement to arrive for other contracts, and also for Shea's Creek, so that we had too much in stock.
8680. What did you do with the 2,000 casks? I transferred it to North Shore and Waverley—some to both places, I think.
8681. Then it was used? Yes; but what about the carting and the interest on the money, and the high price as compared with the cheaper price afterwards.
8682. Then take gratings, £87 10s.—did not the Government take them off your hands and pay you for them? I could not say now.
8683. Take the manhole covers at £30—they were not lost? No.
8684. Then take the interest on the expenditure, £64 4s. 6d.? That is neither here nor there.
8685. Then there is the valuation of the plant on the ground for the completion of the contract, £500—that was not lost; and there was also a loss of profit on the work withdrawn, £1,750—that is not lost? No; I hope not.
8686. Then really there was no claim? Certainly, there was.
8687. Where did it come in? Because the contract had been taken from us.
8688. Was it not intended all along that this work should go on when the Estimates were passed? Certainly not. At all events, we had no intimation to that effect.
8689. Then by what arrangements did you get the job on afterwards? There was no arrangement that I know of. We were told to go on with the work. The Department wrote to us, and told us to go on with it.
8690. Did they ask you for any consideration in the letting of Contract 79? No; I do not see why they should.
8691. In connection with your purchase of cement—as a matter of fact, you do not always take delivery from merchants—you do not have from two to five thousand casks sent out to the works? Yes, certainly; we do not want to handle it several times.
8692. Would it not be better to leave it in the merchants' stores? No; that would put 6d. or 8d. a cask on to it, to pay for storage and handling.
8693. Where had you this 2,000 casks of cement stored? At Shea's Creek.
8694. In a shed there? Yes; we had four cement-sheds, if I remember rightly.
8695. Did you have any inspection by an inspector of works upon Contract 72 prior to your signing the contract for 79 a short time previously? I really could not say. If the official correspondence says so, I presume it occurred, but I do not remember it.
8696. When you obtained Contract 56, did you enter into any negotiations with Bond and Hudson to withdraw their tender? No; I do not know them.
8697. Do you know Mr. Bond now? Yes, slightly, I met him half a dozen times, I suppose.
8698. *Mr. Gummow.*] As to Contract No. 72, if payments were made to you on 20th January, 1892, would not your claim have been put in after that date? Yes.
8699. But it would not be months after the completion of the contract? No. Of course, I could not put in any claim until I got payments upon which to base the claim. The details had to be worked out. They were not worked out by me.
8700. Who worked them out? Mr. B. C. Simpson.
8701. Do you not consider that you suffered a great loss through delay? Yes.
8702. Do you know why Contract 72 was started again? I have no idea, except it was necessary to go on with it.
8703. Do you think it likely that the municipal council and Members of Parliament for the district might have been hurrying on the Government in the matter? Probably.
8704. It would not be due to your action? I never approached them on the subject.
8705. When Contract 79 was accepted did you know if you were going to get the continuation of Contract 72—had you any idea of it? Not the faintest.
8706. As to Contract 56—the Potts' Point contract—Bond and Hudson were the lowest tenderers, and Gummow and Gillan were the second lowest? Yes.
8707. Do you think that Gummow and Gillan were fairly treated in not being allowed to go on with that contract? No; I do not.
8708. Do you think they should have got that contract? Yes, being the second tenderers, and their price being exposed. If the prices had not been exposed, we should not have beaten you the second time.

George Christie, recalled and further examined:—

8709. *Mr. Smith.*] I think the other day you told us that in your investigation you had come to the conclusion that the transaction of Mr. Carter with Mr. Weedon, relative to the £2,000, was not a private transaction between himself and Mr. Carter, but was a transaction between Mr. Weedon and the firm;—  
8329? That does not refer to the transaction with Mr. Weedon, but to sundry cheques.  
8710. Turn to Question 8326;—do you not agree that it was a private transaction so far as Mr. Weedon and Mr. Carter were concerned? As regards Mr. Weedon, I cannot say. As regards the object of obtaining the money, I would distinctly say that it was for the benefit of the firm.  
8711. You said in reply to His Honor that you could draw only one inference from the transaction? Yes; Mr. Weedon handed Mr. Carter a cheque, which Mr. Carter paid into the firm's account, and the firm were wanting money at the time.  
8712. So far as Mr. Weedon is concerned, you do not dispute Mr. Carter's evidence that this was a private transaction between himself and Mr. Weedon? I cannot give any evidence, of course, as to what may have taken place between Mr. Weedon and Mr. Carter; but it seems to me clear that the money was obtained from Mr. Weedon for the benefit of the firm, and you have also the fact that the firm needed the money. Mr. Carter is the leading member of the firm, and whether he wanted money for himself privately, or for the firm, does not seem to me to matter very much. It is almost impossible to  
my

G. Christie.  
13 July, 1896.

- G. Christie.  
13 July, 1896.
- my mind to draw a distinction between Mr. Carter as an individual, and Mr. Carter as a leading member of the firm of Carter, Gummow, & Co.
8713. *Mr. Parkes.*] The benefit of the transaction having been derived by the firm? Yes.
8714. *Mr. Smith.*] Is there not a great difference between the lending of money to an individual and to a firm? I cannot see that in this case there is much difference.
8715. Will you look at the memorandum which I now hand you? Yes. It reads as follows:—

MEMORANDUM of charge made the seventeenth day of June, one thousand eight hundred and ninety-five, by John Carter, of North Sydney, contractor (hereinafter called mortgagor), in favour of Stephen Henry Weedon, of North Sydney (hereinafter called mortgagee). Whereby in consideration of the sum of two thousand pounds lent to the said mortgagor by the said mortgagee upon the execution of these presents (the receipt whereof the said mortgagor doth hereby acknowledge), the said mortgagor doth hereby charge all those the lands comprised in the deeds and certificate of title mentioned in the Schedule hereto (which deeds and certificate have this day been deposited by the said mortgagor with the said mortgagee), with the payment by the said mortgagor to the said mortgagee of the sum of two thousand pounds on the first day of June one thousand eight hundred and ninety-seven, and also interest on the said sum, until payment thereof, at the rate of six pounds per centum per annum, such interest to be paid half-yearly, on the first day of December and the first day of June in each year. In witness whereof the said parties have hereunto set their hands and seals the day and year first before written.

THE SCHEDULE.

- 13 June, 1892. Conveyance, J. W. Johnson and others, first part; The New South Wales Property Investment Company, Limited, second part; J. P. Wright and others, third part; Augustus Morris, fourth part; and John Carter, fifth part—registered number 541; Book 501.
- 4 January, 1888. Conveyance, Thomas John Cook to John Carter; registered number 906, Book 514.
- 27 February, 1867. Conveyance, Thomas John Fisher to Thomas Ellen; registered number 463, Book 102.
- 4 December, 1868. Conveyance, Thomas Ellen to Edward Carter; registered number 1,000, Book 156.
- 29 May, 1894. Certificate of Title, volume 1,128, folio 191, in name of John Carter.

Signed, sealed, and delivered by the said John Carter, in the presence of,—

JOHN CARTER.

F. M. GUMMOW.

Received on the day and year first within written, of and from the within named Stephen Henry Weedon, the sum of two thousand pounds, being the consideration money within expressed to be paid by him to me.

JOHN CARTER.

Witness—F. M. GUMMOW.

We, the undersigned, hereby certify that the typewriting above and on the preceding page of paper is a true copy of the original memorandum of charge, the same having been compared therewith by us this thirteenth day of July, 1896.

T. C. BLUETT, } Clerks in the Bonds and Contracts Branch  
W. M. CLANCY, } of the Public Works Department.

8716. When was it executed? I see that it was filled in with the date, 17th June, 1895.
8717. *Mr. Parkes.*] Is the document registered? No.
8718. *Mr. Smith.*] It is a memorandum of charge from Mr. Carter to Mr. Weedon. It is a matter between those two and those two only? That is what it purports to be. It is an equitable mortgage. It is not an ordinary business transaction.
8719. And you know, as a matter of business, that there is a great difference between a document of that kind, as between two individuals, and a lender of money and a firm? I have no evidence to give upon that point. I cannot comment upon what may have taken place between Mr. Carter and Mr. Weedon.
8720. But you are here, I take it, as an expert in matters of account, and I ask you as an expert whether there is not a great difference between a loan such as this purports to be, from an individual to an individual, and a loan to a firm? I cannot distinguish between Mr. Carter, and Carter, Gummow, & Co., because they are so connected in this matter. Besides, I take it that Mr. Weedon is not an outside friend. The connection is through the contracting firm. There is one series of connections.
8721. *Mr. Gummow.*] How do you know that Mr. Weedon is not an outside friend? Well, from the time Mr. Weedon has been in the Colony and his connection with the Sewerage Department.
8722. But I ask you how you know that he is not an outside friend? Of course I can only express an opinion.

Stephen Henry Weedon examined:—

- S. H. Weedon.  
13 July, 1896.
8723. *Mr. Smith.*] You are a civil engineer? Yes.
8724. You are in the employment of the Public Works Department? Yes.
8725. What are you doing at the present time? At the present time I am surveying.
8726. In the country? Yes.
8727. You know Mr. John Carter? I do.
8728. Some time last year there was a transaction between yourself and him relating to a sum of £2,000? Yes.
8729. Will you state how it came about—that is to say, what was the beginning of it? Last December twelve months, I came into a little money through the death of my father. At that time, I was in charge of a contract for which Mr. Carter was one of the contractors.
8730. What was that? 79A.
8731. I believe you succeeded Mr. Boys there? Yes. When I knew that I was going to have a little money I thought of building, and at different times I had spoken to Mr. Carter as well as to other persons, and had consulted him about the price of land, and what a house would cost, and that sort of thing. In the month of March I was told I was going to be removed from the work I was in charge of and that I was likely to be sent into the country. I therefore gave up the idea of building, seeing that I was so unsettled, and I asked one person and another whether they could give me any advice as regards the investment of the money. I spoke, among others, to Mr. Carter. I was then sent away to do some work elsewhere, and in the meantime Mr. Carter made me an offer. He said that he was paying 8 per cent. for an overdraft, and that if I found I could not do better he would give me 6 per cent. for my money and would give me security for it. He told me at the same time that, if it should so turn out that I at any time wanted the money, I could, if I gave him reasonable notice, get it back. It was a friendly sort of transaction, and in that way I came to lend him the money upon the security which you have before you.
8732. This security was drawn up at the time? I presume so. That is what was handed to me when Mr. Carter got my cheque.
8733. You gave the cheque, and Mr. Carter handed you over that memorandum of charge as security? Yes.

8734.



S. H.  
Weedon.

13 July, 1896.

8734. The transaction was between yourself and Mr. Carter, and not between yourself and the firm of Carter, Gummow, & Co.? Quite so.
8735. You have not been over any of the contracts of this firm since that transaction? No.
8736. And the money was lent after you had left Contract 79A? Yes.
8737. Have you known Mr. Carter for any number of years? Since I have been in New South Wales—since 1891.
8738. *Mr. Gummow.*] Can you tell me what firm prepared this memorandum of charge? Messrs. Johnson, Minter, and Simpson.
8739. When did you pay your cheque to Mr. Carter—do you remember the date? It was drawn on 17th June.
8740. Upon what date did you get your interest? From 1st June.
8741. How was that? I should have paid the cheque before, but I was away at that time, and Mr. Carter said it was not worth while making the date 17th June. He said we had better date the transaction from the 1st of the month.
8742. How did you get paid this interest of 6 per cent.? It was to have been paid half-yearly, but after the first quarter I had a cash payment. I had various payments to make, and I asked Mr. Carter to let me have the payment for the first quarter in advance. He gave me the first quarter in cash as I wished it so. I had some outstanding accounts and I wished to pay them.
8743. Do you know how you received the second and third payments? The second payment was by cheque paid into my account, and the third payment was made in cash.
8744. Why was it made in cash;—was it for any particular reason? I asked Mr. Carter to let me have it in cash because I wanted to pay it into the Savings Bank. I was only up for the day from Wollongong, where I was at work, and I asked him to let me have the payment in cash so that I might put it into the Savings Bank at once.
- 8744½. When you were lending this money did you take security from any parties other than Mr. Carter? No.
8745. Were any other names used? No.
8746. Do you know who witnessed the transaction? I was not there when the document was made out; but you witnessed it, apparently.
8747. *Mr. Parkes.*] When was the deed drawn up? I do not know.
8748. Was it drawn up lately? Not according to the date upon it.
8749. Has it not been drawn up lately? It has been in the bank ever since I received it.
8750. Will you look at the blotches in the ink and also at the signatures? I do not require to look at it, because I know that it has been in the bank. I went to the bank myself and got the document out.
8751. Why did you not get the document registered;—would not your solicitor register it? I had not a solicitor.
8752. Would not the solicitor who drew the document for you be likely to get it registered? I did not see him about it.
8753. From whom did you get the document? From Mr. Carter.
8754. *Mr. Smith.*] It was then deposited with the bank? Yes.
8755. *Mr. Parkes.*] Before coming to this Colony were you not in the Public Works Department in Brisbane? Yes.
8756. In what years? Up to 1886.
8757. Under a Mr. Ballard? No.
8758. He was chief of the department you were in? No; he was the chief in North Queensland. Mr. Stanley was the chief engineer for the Southern and Western lines.
8759. Did not Mr. Ballard have some question raised about the placing of money of his at fixed deposit with a contractor? He lent money to contractors who were working for him.
8760. All through Contracts 79 and 79A you were the resident engineer? No.
8761. You were acting on Contract 79 on February 19, 1894, were you not? Mr. Boys was in charge upon 79.
8762. But were you not acting there as well as Mr. Boys? No. I think I relieved him for a few days.
8763. Did you not on 20th February, 1894, recommend that Inspector Reid be removed on account of his quarrelling with Mr. Carter's men? I know the thing cropped up while I was relieving Mr. Boys.
8764. Did you not write this minute?

When I first observed mixed concrete on the board at mouth of Shaft No. 5, and found from Inspector Reid that it would not be used before evening, I pointed out to him that this was too long for it to stand, for, though mixed dry, the stone had been soaked with water and the sand wetted by the rain. He told me the matter had been inquired into and settled by yourself and the contractors. I am still of opinion that it is detrimental to the strength of the concrete for the cement to be mixed for hours with the other wetted materials before going into the work. [I beg to point out that such friction as is evident by this report, between our inspector and the contractors' men, should be put a stop to at once by removing the offending party from the works, as no satisfactory work can be done under the strained conditions obtaining at present. S.H.W., 20/2/94. Mr. Davis.]

Yes.

8765. Your signature, I notice, is attached to minutes right through the papers in connection with Contract 79 showing that you were in close connection with the work. For instance, on page 331 of the Parliamentary papers you will see this minute by Mr. Davis—"Mr. Weedon to see that the surplus material is delivered to the places named." That is dated 21st August, 1894. Almost from the beginning of the contract you seem to have had some connection with it. For instance, you reported upon the case of alleged sweating on the North Shore contract, did you not? Yes; I reported on that.
8766. You were engaged in supervision all through Contract 79A, were you not? Not all through.
8767. During the greater part of the work, at all events? No. I took up the work at an early stage, but there was a good deal to do when I left it. I do not know whether it is finished even now.
8768. I see from the papers that in October, 1894, you wrote a letter, and I observe there are minutes following that which are noted by you. Then Mr. Davis writes, "Mr. Weedon to see about this," in allusion to the substitution of brickwork for concrete. Your name appears right through the papers in connection with the contract. You must have been engaged upon it right through the job? I was engaged upon that job until it was handed over to the Water and Sewerage Board, on 8th April, 1895.
8769. When the greater part of the work was done? No

8770

S. H.  
Weedon.  
13 July, 1896.

8770. In what condition was the job when you left it? There were most of the shafts to build and the tunnel lining to go in.

8771. On what date do you say it was handed over to the Water and Sewerage Board? On April 8th, 1895.

8772. All through the work up to that date you acted upon it, did you not? I was practically in charge of the work up to that date. The shafts were sunk when I took it over from Mr. Boys.

8773-4. What did you do when you left that contract? I was given charge of other contracts for a short time. On April 9th I was instructed to take charge of Contract 110 at Clay Cliff Creek, Parramatta. Then there was 79A, Rookwood Cemetery drainage; then No. 109, Kensington storm-water channel; and No. 116, Easton Park, Balmain.

8775. You also had to do with Contract 69 at Marrickville? I relieved Mr. Milner once when he was on his holidays.

8776. For how long? He was away six weeks, I think.

8777. It was you who recommended that the filling that was to be done for the altered work, the substitution of one sewer for two, was to be paid for—not at 6d. per yard as in the contract, but—at 5s. a yard? I cannot remember that.

8778. Mr. Davis, on 17th November, 1894, wrote: "Will Mr. Weedon please let me have quantity of filling?" And in reply to that you say, "Quantity of filling due to alteration in design, 410 cubic yards." Mr. Davis, on 21st November, writes as follows:—

The schedule rate for filling is 6d. per cubic yard, but it is manifest that the contractors, in giving this low price, did not contemplate doing the kind of filling required in connection with the western branch sewer, between Premier-street and Illawarra Road. The 5s. asked is, I consider, a little high, but I suppose, as they will lose something by the reduction of concrete and brickwork, occasioned by the alteration, it will be just to take this into account, and allow them what they ask. There will be about 400 cubic yards of this filling, which at 5s. per cubic yard, would amount to £100. I recommend that the price named be approved.—J.D., 21/11/94. Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage.]

Then following that there is this minute by Mr. Hickson:

This addition is caused by an alteration in the original design, which has the effect of reducing the cost of the work in this contract by about £750, and a further reduction on the whole work of £10,000. Recommended for approval.—R.H., 21/11/94.

I suppose it was upon your report that this recommendation was made? I could not be sure now, it is so long ago. I cannot remember these things at a moment's notice; I was only there for six weeks.

8779. Were you on the work when the substitution of a single sewer for a double one was carried out? I believe it was started; I think some of the tunnelling was done.

8780. Was any of the work done during the time you were there? I was only there six weeks. They were not working at the Premier-street shaft then.

8781. Were they working in the tunnel? I do not think they were, but I could not be sure without looking the matter up.

8782. *Mr. Smith.*] The deed which is produced to-day was given by you to the bank? It was lodged with the bank on 17th June, 1895, and I obtained it from the bank to-day on hearing that you wanted it.

8783. *Mr. Parkes.*] It was you who measured up the work upon contract 72? Yes.

8784. At Shea's Creek you had charge of the work all the way through had you not? That was the first work I did.

8785. That was the first contract you went on after you came to the colony? Yes.

8786. When that contract was completed, what quantity of cement had Carter, Gummow, & Co. in their store upon that work? I could not tell you.

8787. Used you not to make a return of the cement in the store? I do not think that on that contract they had any advance upon cement.

8788. Did you not notice what stock they kept. How big was the shed? They had a big shed in a paddock across which we cut with the sewer.

8789. Do you recollect a claim being sent in for a stoppage of contract 72? Yes.

8790. Did you report upon that? I think not.

8791. Do you recollect how much cement was in stock then? No. I never kept any account of it.

8792. Did you have to test the cement? Certainly, it was tested.

8793. Did you test it? No.

8794. Was it your duty to see that the cement used was good? It was my duty to see that only tested cement was used in the work.

8795. Therefore, you would know how many casks were in the shed? No; I had no check upon what they had.

8796. Suppose they had 2,000 casks in the shed on the completion of the job, would you not know that? I might know it, or I might not know it. I know that a large quantity of cement was stored there.

8797. How many casks? I could not pretend to say how many. Unless they got an advance upon the cement I should not have any reason for taking account of it.

8798. *Mr. Gummow.*] As to contract 72—the Munni-street contract—did you supervise the whole of that work? Yes.

8799. Where from? From the junction with the old work—from where the Munni-street branch started.

8800. Did you supervise the whole of the work which Carter & Co. carried out from Munni-street to Shea's Creek? No; what I had charge of was a short branch from the main sewer. Parry and Farley did the top piece of that.

8801. Who did the lower part of the work? Carter & Co.

8802. You had nothing at all to do with the lower part? No; I have been on it. I think I gave Mr. Boys a day's levelling. I know I did some work there one day.

8803. Would you know when the lower part was finished and when it was stopped? No.

8804. Would you know whether the part you supervised was a part of the original Shea's Creek Contract? If I remember rightly it was upon the same schedule. It was like an extension of the original contract.

8805. You do not know whether the part you supervised was part of the original contract? No, not positively.

8806. Do you know anything about the claim made by Carter & Co. upon the Department? If you mean the claim in connection with the delay upon the work, that was never brought before me.
8807. Had you charge of Contract 72 before it was stopped? No, not below the Munni-street branch.
8808. You merely had the portion which it was ordered should be proceeded with in April, 1892? That would be it, I expect.
8809. You do not know what cement Carter & Co. had in stock when the work was stopped? No.
8810. Who had charge of the work? Mr. Boys I believe.
8811. You were not there when the contract was stopped originally? No.
8812. You had nothing to do with that? No.
8813. You merely came on when the extension was ordered to be proceeded with? That is so.
8814. As to Contract 69, you were there for about six weeks? Yes.
8815. You merely relieved Mr. Milner when he was away on a holiday? Yes.
8816. During the time you were there, some stone-filling was ordered to go in? I am not prepared to say without looking through the diary I kept.
8817. Will you look at page 131 of the Parliamentary Papers;—you will see there a letter from Carter, Gummow, & Co. to the Engineer-in-Chief for Sewerage with regard to the alteration of design between the Premier-street shaft and the Illawarra Road, and stating that they would accept the terms in the Department's letter of 11th October if a special item were arranged for the filling at the rate of 5s. per cubic yard; the minute following that letter, stating the quantity of filling in the alteration of design, is initialed by you? Yes.
8818. That minute of yours merely stating the quantity of filling due to alteration in design could not be construed into a report that Carter, Gummow, & Co. should be allowed 5s. a yard for filling? No; my minute was merely written under instructions from Mr. Davis.
8819. You did not recommend the 5s. a yard if it does not appear upon the papers? No.
8820. Were you the resident engineer upon Contract 79? No.
8821. Who was the resident engineer upon that contract? Mr. Boys.
8822. How did you come to initial and sign papers in connection with it? That is while I was relieving him when he was away upon a holiday, I think.
8823. Were you there long? Not more than three weeks.
8824. How many times did you take charge of that contract? I could not be sure, but I think only twice.
8825. That is how it comes about that your initials are appended to some of the papers in Contract 79? Yes.
8826. You were merely there temporarily relieving another officer on his holidays? Exactly.

S. H.  
Weedon.

13 July, 1896.

Henry Melville sworn and examined:—

8827. *Mr. Parkes.*] You were at one time an inspector for the Government upon sewerage works? Yes.
8828. What works were you inspecting? I was on the main sewer at Bondi first of all with Mr. Smail. Then I was at Bourke-street. From that work I was transferred to Parramatta, and then back again down to Bondi and Double Bay.
8829. Were you an inspector upon any of Gummow and Gillan's contracts? I was an inspector on Mr. Gummow's work in Hyde Park.
8830. Were you an inspector upon any work undertaken by Carter, Gummow, & Co.? No.
8831. Was any member of the firm of Carter, Gummow, & Co. associated with any work over which you had supervision? Besides Mr. Gummow's contract which I have just mentioned, I was inspecting work done by Mr. Snodgrass, Mr. Gillan, Mr. Ewing, and Mr. Mathieson, in Abercrombie-street.
8832. How long were you over that work? I was about eighteen months in Abercrombie-street over Mr. Snodgrass's work.
8833. During that eighteen months was a man working there named John Reid? Yes; he was supposed to be gauging cement for the bricklayers and sending down concrete and compo.
8834. What sort of man did you find him? I had a great deal of trouble with him at various times.
8835. What sort of man did you consider him? I looked upon him as a man who had to be watched to make him do his work properly.
8836. During the whole of the time you were there? Yes; I constantly came into conflict with him—once at Thomas-street severely.
8837. Did you ever report him to the Department? It was not "systematical" with me to report him. I used to make him take out work when I found any bad work going in.
8838. To what class of bad work are you now referring? I mean the gauging of the bricklayers.
8839. How did he do bad work in that case? He was supposed to gauge 2 to 1—16 feet of stone, 8 feet of sand, and 4 feet of cement.
8840. What used he to do? Well, I ordered up some stuff which he had once sent down at Thomas-street.
8841. *His Honor.*] Why? Because there were not the proper quantities in the stuff.
8842. In what way? The quantities should be 2 to 1 for the compo. used for the brickwork.
8843. What did he make it? I found it 3 and 4 to 1.
8844. *Mr. Parkes.*] By that means he saved about a barrel of cement in the yard? Not quite a barrel. It would be about three-quarters of a barrel, I should think.
8845. Was he not a source of annoyance to you from the beginning to the end of the work? Yes; I could not pay attention to the men individually, because I had all the brickwork to look after, from one end of the job to the other, and a lot of things might have been done which I did not see.
8846. Did you catch Reid doing bad work a dozen times? I could not be certain that I caught him a dozen times, but I think you might say seven or eight times.
8847. Did Mr. Davis come on to the job? He had nothing to do with that contract; it was under Mr. Wade. Mr. Davis was over the contract from Hyde Park to Balfour-street.
8848. For what reason were you removed from the Department? I was supposed to be removed for allowing bad work to be done. That would be under Mr. Davis, out at Brown-street, Paddington.
8849. What contract was that? Gascoigne's, Heeney's, and Tracey's.

H. Melville.

13 July, 1896.

8850.

- H. Melville. 8850. You received a letter from Mr. Davis? Yes; it is dated 7th February, 1893, and is as follows:—  
 “Mr. Henry Melville having applied to me for a certificate as to his fitness to undertake the drainage of houses, I have pleasure in stating that for about seven years he was employed in the Sewerage Branch of this Department as inspector supervising important works, and since then for over twelve months as foreman for Messrs. Jones and Atherton, on one of our largest and most important contracts. His experience gained in this way should fit him to carry out any drainage works.”
- 13 July, 1896. 8851. Were you told that you had been allowing bad work to go in? Yes.
8852. As a matter of fact, were you allowing it? As far as I could judge, Mr. Davis found fault with me for not getting 6 inches of concrete put round a 24-in. pipe. I should like to mention that another man was dismissed from the same contract—a man named John Brown—because he allowed bad pipes to go in. I had orders to remove all these pipes inside of twenty-four hours, and I believe a complaint was lodged against me that I allowed the same pipes to go back again, which I emphatically deny.
8853. Did the contractors complain of the way in which you dealt with them? Yes. There were constant complaints right through the contract as to my severity.
8854. Were you ever threatened with removal by any contractors' workmen? I was threatened with removal by Mr. Pritchard at Double Bay.
8855. But were you threatened with removal by anyone belonging to Carter, Gummow, & Co.? No.
8856. You said you were inspecting on a work which Mr. Gummow did? Yes.
8857. How did his men behave? A report went into the office that concrete was put in one morning mixed with pure sludge from the bottom of a shaft. That was reported to Mr. Wade. Mr. Davis was conversant with the facts.
8858. Did you take any of this stuff from the position in which it had been fixed? I found it at the top of the shaft when I went there early one morning. I had charge of the concrete, and another man had charge of the brickwork.
8859. Besides Jack Reid, there was a man working on that contract named Bandeen? Yes; he was a man who was not to be trusted. I was always coming into conflict with these men, and Mr. Davis heard of my doing so on various occasions. It was over concrete and various other things.
8860. You mean that you came into conflict with them over the bad work they did? Over the mixing and gauging.
8861. Could you mention the names of other men who did bad work upon that job? Not on that job.
8862. According to Mr. Davis' letter you worked under Jones and Atherton;—had Mr. Carter anything to do with that work? Only when I first went there for employment. He withdrew, and the firm of Atherton and Jones carried out the contract.
8863. Where did the work run to? From Castlereagh-street to the Argyle Cut.
8864. You were a contractor's foreman? Yes.
8865. Did you see defective work going into that job? I could not make myself answerable for all the men down there, because I had all the work to supervise from one end to the other.
8866. Was any bad work going on? They made me take out the crown of the shaft at No. 16, Harrington-street.
8867. Was there any bad work there? The inspector said it was bad work, and Mr. Davis had it taken out. I myself did not think it bad work; I have seen plenty worse.
8868. How was the packing done upon that job? I was not always down below to see what the packing was like.
8869. Was any timber once put in the packing over the sewer for concrete? No.
8870. Do you know whether any timber was put in as concrete at any time upon that contract? I could not be answerable for that.
8871. *His Honor.*] Did you hear of its having been done? No.
8872. Did you suspect that it was done? No.
8873. *Mr. Parkes.*] Was the packing on that job well done? As far as I know, it was. I could not always be present when that work was being done.
8874. Coming to the work in which Mr. Gillan and Mr. Snodgrass were interested in Abercrombie-street, was there any defective work there? A man named Johnson was put away from that work by Mr. Wade for bad packing.
8875. Was a man named Stone also put away? He never worked on that contract.
8876. Was any other man put away? A man named Malcolm, a bricklayer.
8877. Any other men? Not that I know of.
8878. As regards Reid, you positively assert that you have caught him putting in insufficient cement into the compo.? Yes; I stopped him from doing so at the shaft at Thomas-street, and I had the stuff taken out.
8879. Did you stop him from doing that more than once? Yes, and I had the stuff put into a bottle to test it.
8880. And you found it defective? Yes.
8881. *Mr. Smith.*] You did not report him? It was not “systematical” with me to do that. When I found bad work I had authority from the engineers to have it taken out; I remember, upon one occasion, fetching Mr. McMordie out at 2 o'clock in the morning. That was on a section of the Double Bay work—the contract that Mr. Pritchard finished.
8882. *Mr. Gummow.*] With regard to the contract in Abercrombie-street? You had nothing to do with that.
8883. Had Mr. Carter any connection with that contract? No; I was not over any work in which you and Mr. Carter were concerned together.
8884. Was Mr. Forrest interested in the work? No.
8885. Take the work in Harrington-street—was I interested in that? No.
8886. Was Mr. Gillan interested in that? No.
8887. Was Mr. Forrest? No.
8888. Was Mr. Carter? He was one of the three contractors when I first went there, but he withdrew from the contract, as I was given to understand. I do not know anything about his object in withdrawing. I am not supposed to know his business.
8889. Was he ever one of the contractors for the Harrington-street contract? He held a tender for the contract with Atherton and Jones, but he left it. He was there for about a fortnight after the work started.
- 8890.

8890. Was he there when the bad work which you were ordered to take out was done? I know he left H. Melville.  
the firm. I know nothing further about him than that.
8891. Was he there, do you know, when any bad work was done? Not that I know of. He was there 13 July, 1896.  
a fortnight, as I have said.
8892. As to the Hyde Park contract in which you say I was interested, you say that some sludge was  
used in the concrete? Yes; the stuff was taken out, and some of it was sent into the office at Riley's  
Chambers, Bathurst-street.
8893. Were you head inspector? No, Gledhill was.
8894. He was over you? No.
8895. What were you then? We held two distinct positions. I had the concrete to look after and  
Gledhill had the brickwork to look after. It was early one morning when I found this stuff going down  
one of the shafts. A man named Shellback was putting it down.
8896. What happened to him? I do not know; but a sample of the stuff was taken out of the shaft,  
and was placed before Mr. M'Mordie by Mr. Wade's orders.
8897. Did Shellback continue on the contract? Yes.
8898. He was not removed? No. The responsibility of removing him was left upon Gledhill's shoulders.
8899. Was the man who did this bad work kept upon the contract? Yes; you persisted in keeping him  
on.
8900. You were on the outlet works at Bondi? Yes.
8901. You may remember that I was there too? Rather.
8902. You had charge of the concrete work? Yes.
8903. Whose gang were you supervising? Banteen's principally.
8904. Had you occasion to find fault with him for the carrying out of the work? Yes—more than once.  
I was always checking him in his gauging of the stuff on the board.
8905. As a matter of fact were you not always well satisfied with the way in which he carried out his  
work;—have you not spoken about the splendid quality of his work, and about the great amount of work  
which he could put through in a day? I was satisfied with the amount of work he put through.
8906. Was it put through in a proper way? I think that if I had not been there to keep him in his place  
the work would not have been done as well as it was.
8907. *Mr. Parkes.*] By keeping him in his place you mean keeping him straight? Yes.
8908. *His Honor.*] What sort of man was Reid;—was he given to drinking? Yes.
8909. Was he often under the influence of drink when he was upon the works? I have seen him once or  
twice under the influence of drink on the works. What he did off the works was of no business of mine.
8910. When he was doing the bad work to which you have referred was he under the influence of drink?  
I do not think so.
8911. When he did improper gauging, for instance, you think he knew what he was about? Yes.
8912. *Mr. Gummow.*] Is it not a fact that you are a natural grumbler? I am much obliged to you for  
the compliment. There is one thing I should like to mention. Through the kind influence of yourself, I  
presume, I have been shifted out of Government employ. I was a nuisance to you because I would not  
allow your men to do bad work.
8913. *His Honor.*] Then you say that you are not a natural grumbler? No man who has charge of these  
contracts can always control his temper. I was thirteen years in the employ of the Department. And under  
Mr. Bennett I lost one of my hands. Finally I got dismissed as I have told you. Mr. Gummow knows  
very well that at the time of the job in Hyde Park he would not speak to me for three weeks because I  
would not allow him to do what he liked. It was a question of his tearing the ground to pieces. I would  
not sanction the measurements without their going to Mr. Wade. I was sent from Abercrombie-street to  
stop Mr. Gummow from tearing the ground to pieces.
8914. When you say that Mr. Gummow persisted in keeping Shellback on the work what did you mean?  
I was referring to what occurred under him. The inspecting work was divided between Gledhill and  
myself. I was supposed to look after the concrete; but I could not see all the stuff that went in, because  
the inspector is not supposed to go on to the works until 9 o'clock in the morning, and the men start at  
7 o'clock.
8915. There is plenty of time for them to do bad work before the inspector is there? If they choose.
8916. Did Gledhill report Shellback, do you know? I reported him to Mr. Wade. I know nothing of  
what took place between Mr. Wade and Gledhill; I know that I went there one morning at twenty  
minutes to 8 o'clock and saw this bad stuff going down the shaft. I did not think it ought to be allowed  
in justice to the work itself, and I reported it to Mr. Wade, who had some of the stuff taken into the  
office.
8917. Then did Gledhill try to get Shellback taken off the work? I cannot say. The matter was taken  
clean out of my hands.
8918. All you know is that Shellback remained? Yes.
8919. You do not know how that came about? No.
8920. *Mr. Parkes.*] Used Mr. Davis at any time to read the bible to you? He told me that I would  
never go to Heaven if I were not a better man.
8921. Used he to give you lectures upon religion? Yes.

WEDNESDAY, 15 JULY, 1896.

Joseph Davis recalled and further examined:—

8922. *Mr. Parkes.*] Will you tell His Honor from the specifications of Contract 79 the nature of the concrete  
used for making the invert of the sewer—that is to say, the bluestone concrete of 4, 2, and 1, and 7, 3, and  
2, and the sandstone concrete of 5, 2, and 1? If you look at clause 27 of the specifications, which you  
will find upon page 280 of the Parliamentary papers, you will see that it is as follows:—

27. All concrete to be prepared close to where it is required on sawn timber plank platform, all proportions to be  
correctly ascertained by measurement, the metal to be well washed when put on the platform and levelled at top, the  
sand to be placed in a level layer above the metal, and the cement to be placed upon the sand; after which all materials to be  
carefully mixed and turned twice over, and then the whole to be mixed with fresh clean water, and thoroughly turned  
over twice, and oftener if required, until, in the opinion of the Engineer, it shall be well incorporated and fit for the work  
before it leaves the platform; it shall then be at once conveyed to the works as shall be directed; and to be used fresh.

J. Davis.  
15 July, 1896.

8923. That concrete has to be put in in certain layers, and then grouted with a special cement—that is to say, one layer of concrete is put on and it has to be grouted before the next layer is put on? Where the engineer requires that to be done. The grouting is usually done at the beginning of the day, when the concrete has had time to set.
8924. But the work has to be carried out right through layer by layer, with grouting between? The work has not been carried out in that way.
8925. Is that not according to the specification? The specification may provide for it to be done if it be required, but in most cases it would not be advisable to do the work in that way.
8926. But would not that be in accordance with the specification? The specification requires the work to be done in that way supposing the engineer thinks it desirable to call upon the contractor to do it.
8927. Where is the conditional clause? I am aware of the existence of clause 95 upon page 286 of the Parliamentary papers, but I may say at once that it would not have been desirable to put that clause into operation, because in my judgment the work done in that way would not have been so good as it was, done in the way in which we did it. (*Vide Appendix No. 35.*)
8928. The clause to which you have referred, then, was never carried out? Not unless there were some particular case where it might be advisable to carry it out. Generally it would not be so.
8929. But it is mentioned that the concrete has to be put on in layers? Yes. A layer is put on the top of the layer already laid before it has time to set, and so the work proceeds.
8930. What would be the extent of a layer? Nine inches.
8931. Do you put a cement grouting between? No; there is no necessity for cement grouting, because the lower layer is green—in fact, it is quite wet—when the other layer is put on the top of it.
8932. What section would be done at a time? In a tunnel, I suppose, they would work right ahead, and do as much as could be done in a day—probably a chain and a half. It would depend upon circumstances. It might be more or less, according to the quantity of concrete that would have to go in.
8933. And do they commence with the second layer on the next day? No; the whole sewer is finished in one operation.
8934. But take the first layer of 9 inches—to what extent is it carried? Perhaps I had better explain how the work is done, and then you will know precisely what happens. Take a tunnel: After the excavation is finished the tunnel is thoroughly cleaned out, and what are known as pats—that is small blocks of concrete—are put along the centre. The levels and lines are given on the top of these concrete pats. Then the pats are allowed time to set, probably two or three days or more. The centering is then put in on the concrete blocks; and when the centering is put in the concrete is put round the centre. You could not put it in layers in the case of the tunnel. There are circumstances in which it would be advisable to have the work done in that way, but not in the case of a tunnel.
8935. But is it not the intention of the specification that the work should be done in that way in a tunnel? There is a general clause applying to the whole of the concrete work.
8936. Take clause 27? That has to do with the way in which the concrete has to be mixed, and not with the putting of it in position.
8937. But take clauses 93 to 97;—what do they indicate? They have to do with the way in which the concrete is put in position generally.
8938. Are all the clauses in the section dealing with concrete work adhered to? Where they apply; but we do not adhere to a clause simply because it is there. We make use of these clauses intelligently.
8939. And is the specification generally carried out? In its entirety.
8940. As far as concrete work is concerned? Yes.
8941. Take the proportions of 7 of metal, 3 of sand, and 2 of cement, and treat them as separate heaps;—will you let us know the total quantity that would proportion to one cask of cement? I may say at once that that is a most difficult question to decide.
8942. For instance, how much cement would there be in the 24 feet, taking the 7, 3, and 2 mixture? There would be four parts of Portland cement.
8943. That is a cask? Not necessarily.
8944. What is a cask? A cask is a cask.
8945. Is not 4 feet the standard measurement of a cask? No.
8946. Is it not the standard put in your specification? We say we will accept a cask for 4 feet, but that is not the measurement of a cask.
8947. Is it not what you put down in your conditions? We say that we will accept a cask of cement as equal to 4 cubic feet of cement.
8948. Is that not accepted as a standard quantity of a cask in all the selling and buying trades, in all the building trades in which cement is used? We accept it in connection with the sewerage contracts. In the case of the harbours and rivers I think the standard is  $4\frac{1}{2}$ ; in some cases it is  $4\frac{3}{4}$ . In the sewerage contracts we have kept to 4 cubic feet. It is an old measurement introduced years ago by Mr. Bagge.
8949. If  $4\frac{1}{2}$  feet were allowed to a cask, would that be a fair average measurement? That again would depend upon the fineness of the cement.
8950. That will not interfere with the bulk, will it? Yes; it will make all the difference. If you take fine cement out of a cask of German cement, and coarse English cement out of another cask, and then measure the two quantities of cement, you will find that you get more from the German cask than from the English cask.
8951. Still the bulk is the same in the cask? The bulk is compressed into the same space. Of course if you take it out of the cask it is another thing.
8952. But half a foot in 4 feet is a very fair margin to give? I would not say that it averages a half. It would depend upon the fineness of the cement.
8953. Would the average be less than  $4\frac{1}{2}$ ? The average would be more I should think, but I could not say positively. It depends entirely upon the fineness of the cement.
8954. Take the 4, 2, and 1, concrete—suppose you do not mix the quantities but take the bulk of each material, 4 feet of cement would go to 28 feet unmixed, would it not? Four parts of Portland cement would go to 8 parts of sand and 16 parts of bluestone metal.
8955. Then take the 5, 2, and 1 sandstone concrete—if you put the sandstone, the sand, and the cement side by side in that case 4 feet would go to 32 feet, would it not? The 4 feet would correspond with the 8 feet of sand and 20 feet of stone.

8956. Take the 4, 2, and 1—you say that taking the bulk of the material independently it comes to a certain total;—if you mix the materials of each lot together would not the 2 of sand and the 1 of cement disappear in the interstices of the stone in each of the cases? Certainly not.
8957. To a great extent it would do so, would it not? Most decidedly not.
8958. What fills up the interstices? The compo., of course. What you say is that they disappear, and I do not agree with you.
8959. If they fill up the interstices they must disappear? They disappear in so far as they are required to fill up the interstices of the stone, but not beyond that.
8960. The same thing would happen in the 5, 2, and 1 mixture, would it not? The sand and cement when mixed together would disappear in so far as they are required to fill up the interstices of the stone, but not beyond that.
8961. The same thing would apply to the other concrete? Necessarily so.
8962. This would, in the three cases, reduce the bulk considerably? I do not think it would do so considerably, but it would reduce the bulk.
8963. *His Honor.*] Do I understand that the concrete pats are so brought up that the level of the top of the invert is the level of the top of the pats? Yes; the level of the invert corresponds with the top of the pats. The centering is placed on the pats, and the sewer is constructed round the centering.
8964. What length of centering would be constructed at once before you begin to put in the concrete? In the case of a tunnel the centering has to be constructed at the same time as the sewer. In these small tunnels you have to breast the work forward.
8965. How far can you get back? Not more than 10 feet. The work is breasted forward in 10-ft. lengths. The men go midway between the shafts, and then build the sewer outwards towards the shafts.
8966. So that the concrete has to be forced between the centering and the wall of the tunnel? Between the centering and the sandstone rock.
8967. So that you could not put it on in layers? It would be impossible to do so in that position.
8968. *Mr. Parkes.*] Can you not work over the side of your centres? You can do so when you get to a certain height, but you cannot do so in the lower portion of the work.
8969. You do not put in your centering until you get some of the concrete fixed? It is put in on the top of the pats.
8970. *His Honor.*] You are referring now to cases where you are building a concrete invert with a brick arch on the top? Yes. The brick arch is another operation entirely. Generally the concrete is finished up to the springing level of the sewer between the two shafts. The bricklayers are then sent in, and start midway towards the shafts with the brick arching.
8971. The centering for the concrete is merely a half centering? Yes; it completes the work up to the level of the springing of the arch.
- 8972-3. How is the centering kept down? Stays are put across the tunnel, and the centering is bolted to the cross-pieces. In some cases, where necessary, there is a stay coming down from the roof, but of course where the cross-pieces are fixed in the rock of the tunnel the vertical pieces are unnecessary.

William Kenwood sworn and examined:—

8974. *Mr. Parkes.*] Do you know Mr. C. B. Bond? Yes.
8975. He is your father-in-law, I believe? Yes.
8976. Do you transact his business for him? No, I do not.
8977. Do you not generally advise him in his business? No. His business is that of a produce merchant.
8978. But he consults you in business matters? In certain business matters.
8979. Do you know Mr. John Carter, the contractor? Yes.
8980. Did Mr. Carter call upon you with reference to a contract at North Sydney known as 79 Contract? I remember his calling upon the firm of Kenwood & Co.
8981. What did he ask you to do;—what was his business with you in connection with that contract? He asked me, if I remember rightly, whether I thought Mr. Bond would withdraw his tender for a consideration. I remember telling him that that was a matter for Mr. Bond to determine, but if he thought Mr. Bond would do so, I would introduce him.
8982. On what date was that? I could not say, speaking from memory.
8983. The letter I now hand you is in your handwriting, is it not? No; it was written by my partner at that time, Mr. Kerle.
8984. The letter is dated 28th September, and the effect of it is to withdraw Mr. Bond's tender? It is addressed to the Secretary for Public Works.
8985. I suppose it was before that letter was written that Mr. Carter called upon you? Yes.
8986. Did you go with him to see Mr. Bond? I did.
8987. What did Mr. Carter say to Mr. Bond? Mr. Bond's interview with Mr. Carter was to a certain extent a private one, and as far as I can remember I did not hear all that passed. I was present, but I did not take cognisance of what was said further than that I knew what the business was about.
8988. Do you remember Mr. Bond asking Mr. Carter what guarantee he had that he would get Contract 79 before this other arrangement was arrived at? Mr. Bond certainly required some consideration from Mr. Carter on the ground that he was losing the contract. He wanted some consideration from Mr. Carter before he withdrew his tender.
8989. When was that consideration paid? At about that time, I think.
8990. Will you look at the promissory-note I now hand you;—have you seen it before? No.
8991. What date does it bear? 23rd March, 1892.
8992. This letter which you say Mr. Kerle wrote is dated 28th September, 1891? Yes.
8993. What guarantee then had Mr. Bond that he would receive the money which was agreed upon? No further guarantee than the bill, I take it.
8994. But the promissory-note was not made until March, 1892, whereas Mr. Bond withdrew his tender in September, 1891? I could not say anything further as to that than this,—that Mr. Carter is a reputable man, and, I presume, his bill would be considered good.
8995. But Mr. Bond did not get a bill then, he only got a promise to pay? Well, I take the promise to be the bill.

J. Davis.  
15 July, 1896.

W. Kenwood.  
15 July, 1896.



- W. Kenwood. 8996. The bill is dated March 23rd, 1892, and the contract is signed March 13th? Yes. I suppose that Mr. Bond took Mr. Carter in good faith. I remember his asking me who Carter & Co. were, and I said they were very reputable men, and that he could depend upon them. I have no doubt, therefore, that he took Mr. Carter in good faith.
- 15 July, 1896. 8997. But the date of Mr. Bond's letter withdrawing the tender is 28th September, 1891;—is it not? Yes.
8998. Was any bill executed at that time? No; not to my knowledge.
8999. Was Mr. Bond a man likely to enter into an arrangement to withdraw his tender without some guarantee from Carter and Co. that they would get Contract 79? Of course there must have been some guarantee, but I do not know whether it had reference to that contract.
9000. But the promissory-note comes in after the contract was signed;—what I want to know is what guarantee was given at the time the letter was written withdrawing the tender? I really do not know.
9001. Do you know whether Mr. Carter informed Mr. Bond that he had a promise that he would receive Contract 79? I do not know about that; but he certainly did not tell me so.
9002. Do you remember the conversation which took place at the interview to which you have referred? The conversation, as far as I can remember it, was this: there was a proposal by Mr. Carter to purchase Bond and Hudson's right to the contract, Mr. Bond undertaking to withdraw their tender.
9003. But when were they to be paid for doing that? That I could not say. That was a matter arranged between Mr. Bond and Mr. Carter himself. Mr. Bond subsequently saw me and asked me what I thought of the proposal and I remember pointing out to him that as he would have to find a very considerable quantity of plant for the job—plant of which he had none in stock—it was probably a very good opportunity for him to sell. Beyond that I do not know what arrangement was made.
9004. Was there any agreement drawn up at the time? An agreement was drawn up by Mr. Kerle between Mr. Carter and Mr. Bond.
9005. Could you produce it? I could not say. It was handed to Mr. Bond, I believe, and he has been out of business so many years that I question whether it could be found.
9006. *His Honor.*] Is Mr. Kerle in business now? Yes. I ought to explain that I was requested by Mr. Bond to watch his interest and to assist Mr. Hudson in making up their tenders. This matter being connected with one of their tenders, Mr. Bond asked me my opinion upon it. When Mr. Bond accepted Mr. Carter's terms I asked Mr. Kerle, as I thought it better for him to do it, to write out an agreement between Mr. Bond and Mr. Carter. That agreement I believe was written out, but whether it was destroyed among other papers in connection with Mr. Bond's business, or whether Mr. Bond kept it afterwards, I could not say. The agreement was written, and was witnessed by Mr. Kerle. The cheque which is produced was received by Mr. Kerle. I did not receive it.
9007. You are referring now to the cheque of £200 which was given to you by Mr. Carter? Yes.
9008. There is an indorsement of Kenwood and Kerle upon that cheque? Yes.
9009. Therefore it was paid into their account? Yes.
9010. Have you no recollection as to where the agreement between Mr. Bond and Mr. Carter was put? It is extremely probable, I think, that it has been destroyed. Mr. Kerle and I dissolved partnership fourteen or fifteen months ago, and Mr. Bond and Mr. Hudson have had no work together for the last three years. I imagine that a document of the kind to which you refer would not have been kept by Mr. Bond, even supposing it to have been sent down to him. I very much question whether it was. I think we may have kept the agreement ourselves. In that case it would be put with the papers in connection with Kerle and Kenwood's affairs. When we were shifting our offices I do not remember seeing it, but I can search for it if you wish it.
9011. Can you tell us the nature of the agreement—that is, what it contained? I do not remember ever reading it, but I know its nature. It was this—that for a certain consideration Mr. Bond should withdraw his tender.
9012. Will you make a search for the document and produce it if you can find it? Yes.
9013. After this transaction with Mr. Carter did you see Mr. Hickson at all? No; I never met Mr. Hickson at all in connection with any of these contracts.
9014. Did you see any officer of the Department? No.
9015. Had you any conversation with Mr. Hudson? Yes.
9016. You did not tell him anything about the matter, did you? Yes, to a certain extent, I told him. I believe he understood that the matter had been arranged. I think he had been previously told by Mr. Snodgrass. I remember his saying that Mr. Snodgrass had met him and had told him on two or three occasions that the job was not a good one for him, and had asked him what he was going to do in the matter. I think, therefore, that Mr. Hudson had some knowledge of the arrangement. I think he understood that matters had been arranged between Mr. Bond and Mr. Carter.
9017. Did he know that Mr. Bond had received £750 to withdraw the tender? That I could not say.
9018. You did not tell him that? No; I believe he knew there was to be some consideration, because there had been previous losses on contracts, and he must have known that this money went to reimburse him for losses. I think Mr. Hudson must have known that, but, of course, I cannot say to what extent his knowledge went.
9019. You did not tell him yourself that Mr. Bond had received the £750? No.
9020. *Mr. Gummow.*] Do you know of your own knowledge whether any cash passed between Mr. Bond and Mr. Carter? I could not say.
9021. With regard to the document which Mr. Kerle drew up—I mean the agreement between Mr. Bond and Mr. Carter;—when the payment was made, would not that document be useless as far as any further transactions were concerned? The promissory-note may be a renewed one for all I know; I do not know whether it is so or not.
9022. But if the money were paid in connection with the transaction, would not the promissory-note be worthless after the payment had been made? Certainly.
9023. I am assuming that it had been paid? Exactly.
9024. When Mr. Carter saw you with reference to this tender of Bond and Hudson's, did he not point out to you that you were rather low in your tendering? No; the first I heard of that was through Mr. Hudson. He said that he had seen Mr. Snodgrass and that Mr. Snodgrass had asked him what we were going to do.
9025. But you had heard that your tender was low, taking the schedule basis? No; I thought we had a fair price.

John Carter recalled and further examined :—

9026. *Mr. Parkes.*] When you made the arrangement with Mr. Bond, which has been referred to this morning, did you then give him a promissory note? No; I gave him a cheque.
9027. For what amount? £750.
9028. That was another £750, then? Yes.
9029. In all then you paid Mr. Bond £1,500? Yes.
9030. First you gave him a cheque for £750 and then a promissory note for £750? Yes.
9031. Did the cheque go through the account of Carter & Co.? Yes. I have some faint recollection of the agreement which has been referred to. To the best of my recollection it was torn up in Mr. Bond's presence.
9032. Was it after the promissory note had been paid that the document was torn up? Yes.
9033. *His Honor.*] I do not understand how it comes about that the promissory note bears this date—was that the date of the transaction? No; the transaction occurred towards the close of 1891. Your question refreshes my memory to some extent with reference to the agreement. There were only a few words in it. It was to the effect that we were to pay Mr. Bond £750 down, contract or no contract—I risked that £750—and that if the tender were accepted, a promissory note was to be given to him for the balance of the £750. I presume the tender would be accepted about that date—that is, the 23rd March—and that I then gave him the promissory note.
9034. *Mr. Parkes.*] The contract was signed on March 13th, was it not? Yes; you will see that that would allow me ten days for the transaction of this business with Mr. Bond. The cheque to Kenwood and Kerle was a payment for services rendered.
9035. Why did you not pay that in September instead of March? They were not entitled to it until the transaction was completed.
9036. It was not completed until the payment of the promissory note in June, 1892? I think that when I once gave the promissory note the transaction was settled.
9037. *His Honor.*] Then it cost you £1,700 to get the contract? Yes.
9038. You must have had great confidence in it? Yes, I had from the fact that we knew our business, and that I thought we should make a fair profit out of it. I also wished to employ two or three thousand pounds worth of air-blowing and other plant which was lying idle. We had about £3,000 worth of plant ready for the job, and we wanted to utilise it, and get some return for it.
9039. *Mr. Parkes.*] At that time you had completed all your contracts? No.
9040. You had a lot of plant lying idle? Yes. It was being released every day—hoisting engines, air-blowing plant, and things of that kind.

J. Carter.  
15 July, 1896.

George Edward Hudson recalled and further examined :—

9041. *Mr. Parkes.*] When you were here the other day, you stated that you had several interviews with officers in the Public Works Department? Yes. I do not know how many, but I was down there three or four times.
9042. Would that be after the commencement of the year 1892? I could not tell you the date at all. I know it was after we had tendered for the job, and before we got our money back.
9043. Do you recollect when the money was really got back? No; all that I know is that we got it back. I remember Mr. Bond telling me so.
9044. On what date did he tell you? I do not know, but the cheque would show the date.
9045. How long before you saw from the newspapers that the contract had been let to Carter, Gummow, & Co. was it that you had been calling at the Public Works Office? It must have been a couple of months.
9046. Did you know that Mr. Bond received £1,500 to withdraw your tender? No; I knew there was an arrangement of some sort or other, but what it was I did not know. I know that Mr. Carter saw Mr. Bond in reference to the matter. I remember Mr. Snodgrass seeing me and telling me that we should not make anything out of the job as we were so much below them. I thought he was merely endeavouring to frighten us from taking up the job.
9047. And that he was inducing you to relinquish it? Yes. They were the next tenderers, and I took it that if we let the job go they would have a show of getting it. I thought they were trying to get at Mr. Bond and myself.
9048. On Monday you said that you had never before heard of a letter of Mr. Bond's withdrawing your tender? No; I never heard it until you read it.
9049. Therefore you did not know that the contract had been withdrawn? No. I told Mr. Bond to write withdrawing the deposit, and I understood that that was what was done.
9050. You did not understand that he was to forfeit the contract? No; but he may have misunderstood me, and have written accordingly.
9051. If you were told that a former witness had informed us that he paid Mr. Bond £1,500 to withdraw your tender, would it surprise you? It does seem rather funny. I saw from the newspapers that Mr. Carter had paid £750.
9052. Did you ever hear of that before you saw it in the newspapers lately? No; I cannot say that I did.
9053. You had no knowledge of it? No.
9054. *His Honor.*] Did you not get anything? I have been contracting with Mr. Bond, and we have had several losses. I was in Mr. Bond's debt to the extent of some £700 or £800 at one time and another, resulting from losses on jobs. He held my name as security for that amount, and I should not wonder if this transaction had taken place, and he had taken the money in repayment of that debt. The old man is a gentleman, and he is honorable, and I trusted implicitly in him in whatever we did. I was satisfied that what he did would be for the benefit of the firm. I made inquiries yesterday concerning a matter, but I could not get any satisfaction from his son-in-law.
9055. You think he may have written a sum of money off your debt? It may be so. I have not had time since I gave evidence here the other day to find out the rights of the matter. I saw the statement in the *Sydney Morning Herald* of yesterday, and I came into town to interview Mr. Kenwood about the matter.
9056. *Mr. Parkes.*] Mr. Bond is very ill, is he not? Yes.

G. E. Hudson.  
15 July, 1896.

9057.

- G. E. Hudson. 9057. You know Mr. Kenwood very well, do you not? Yes; I have been acquainted with him ever since I have been acquainted with Mr. Bond.
- 15 July, 1896. 9058. You had to do contracting work with Mr. Kenwood? Yes; I had to submit all tenders to him so that he might check them. I put down the items and he checked them on behalf of Mr. Bond. He looked after Mr. Bond's interest in every shape and form.
9059. Did Mr. Kenwood ever mention to you the transaction which has been referred to this morning? All that I knew was that Mr. Carter had seen Mr. Bond. Mr. Snodgrass saw me as I told you, but he never offered me a shilling.
9060. Did he tell you that they could get the job if you were out of the way? No; but I knew they were the next tenderers, and that if we threw up the job it would probably fall to them.
9061. Has it not been your experience as a contractor that in such cases the work is re-tendered for? Not in all cases.
9062. Do you know of any case where that has not been done? I could not call them to mind at the present moment, but I know there are several cases where the contract has been given to the next tenderer.
9063. Where the next tenderer has been £3,000 over the amount of the lowest tender, do you know whether it has been done? I do not know that I do.
9064. What do you say would be the probable profit upon the work if you had gone on with your tender? To the best of my recollection I made it run out at £5,000.
9065. Is that the profit you expected to make? Yes; about £5,000. Mr. Kenwood went over the items with me. We had to do this in every instance to convince Mr. Bond.
9066. Only a few contractors tendered for this particular job? I do not know how many there were.
9067. It was a very big work? Yes.
9068. The only contractors were Bond and Hudson, Carter & Co., Gummow and Gillan, D. Sheehy, J. M'Sweeney, Lemme and Spencer, and J. Taylor & Co.? Yes. Carter & Co. and Gummow and Gillan were separate at that time. I reckon that seven tenderers for a big job like that is a fair competition. There are often only three when the job is a very big one. It is out of the reach of poor men, and they cannot afford to go for it. I myself have often been kept from tendering for big jobs.
9069. These big jobs you say keep small contractors from tendering? Yes.
9070. Do you recollect whether it was Mr. Mitchell and not Mr. Piper you saw concerning your tender? Mr. Piper is the only man I know by name. I went to him to get back our cheque when our tender was not accepted.
9071. Would you know the man if you saw him? No; I went to several at that time.
9072. Did you go to the clerk in the tender room—to the officer in charge of tenders? I cannot say, speaking from memory.
9073. He never informed you that Mr. Bond had withdrawn his tender altogether? No.
9074. What did he tell you? He said we could get back our money by applying for it.
9075. And that you could take your tender up at any time? He said that we could withdraw our money without prejudice.
9076. Without prejudice to your tender? Yes.
9077. Was there any probability to your mind of the job being gone on with? Long before that I asked when the Department were likely to go on with the job. I was continually coming down to know if the department were going on with it, and they said they were not likely to be going on with it for two years.
9078. Could you not recognise the officer you saw if he were brought here? No, I cannot say that I could.

George Christie recalled and further examined:—

- G. Christie. 9079. *Mr. Parkes.*] Since you were here on the last occasion, you have gone carefully through the whole of the transaction in connection with the letting of Contract 79? Yes.
- 15 July, 1896. 9080. In these Parliamentary papers there are a great number of papers having reference to Contract 72 missing, which have a concurrent effect so far as Contract 79 is concerned? Yes; there is a necessary connection between the two Contracts—72 and 79.
9081. And the material papers in connection with Contract 72, bearing upon the letting of Contract 79 to Messrs. Carter & Co. without re-tender, are omitted? None of them are included in the Parliamentary papers.
9082. Will you read, as part of your evidence, a memorandum showing the result of your investigation in this matter? Yes; it is as follows:—

MEMO. No. 4.

*Re* the incompleteness of the papers relating to Contract No. 72 (Shea's Creek) in the return furnished by the Department of Public Works to the Legislative Assembly, in compliance with an order dated 10th October, 1895:—

(a) The papers relating to Contract No. 72 appear in the return as printed at pages 135 to 162. Of these, only two pages are occupied with other matter than the Contract Bond and Annexures thereto. (*See* also Index to Printed Papers.)

(b) A perusal of the papers as printed would convey to the Legislative Assembly the following as the story of the contract:—

- (1) Tenders were invited in the usual way, and Messrs. Carter & Co.'s tender for £20,650 (on schedule rates) was the lowest received, and that tender was accepted.
- (2) The contract was signed on 16th March, 1891, and the time for completion was eight months.
- (3) An extension of time of four months from 18th April, 1892, was granted on 19th April, 1892.
- (4.) That the work was duly and satisfactorily completed without any dispute. And that the final certificate was granted for £25,264 19s. 4d.

(c) No information was conveyed to Parliament by the papers that the works had been stopped by the Department for the four months preceding the agreement dated 19th April, 1892, under which the extension of time was granted. Nor that the contractors had made a claim for £4,050 9s. 6d. Several important minutes as to the providing money to meet liabilities under the contract are omitted. The suit, *Macnamara v. Smith*, in connection with which £316 12s. 6d. was paid by the Government is not mentioned. The whole of the correspondence on these important matters, and the usual departmental matters, have been omitted.

(d) I have carefully examined the papers which were withheld from Parliament, which have now been obtained by the Commission. Dealing as they do with such important and special matters as are referred to in the above paragraph (c), there can be only the one conclusion, namely, that the papers were knowingly withheld.

(e) I append a schedule of certain of the papers which were omitted.

Sydney, 15th July, 1896.

GEO. CHRISTIE, F.S.A.A.  
SCHEDULE

SCHEDULE of Papers in connection with Contract 72 not included in Parliamentary Return, ordered 10th October, 1895.

G. Christie.  
15 July, 1896.

| Registration No. | Date.         | Writer.                                       | Subject.   |
|------------------|---------------|---|--|
| 91-2424          | 3 Oct., 1891  | J. Davis (minute) .....                       | Arranging votes available to finish contract.  |
| 91-2637          | 23 „ 1891     | E. A. Nardin (minute) .....                   | do do  |
| 91-2819          | 28 Nov., 1891 | J. Barling (minute) .....                     | do do  |
| .....            | 13 Oct., 1891 | R. R. P. Hickson (letter) to Carter & Co.     | Notifying intention to stop works at a certain point in accordance with clause 3 of the specification.                                       |
| 91-2824          | 21 Nov., 1891 | C. H. Ohlfsen - Baggé (minute).               | Commenting on local Council's communication complaining of stoppage of the Munni-street works.   |
| .....            | 5 Feb., 1892  | R. R. P. Hickson (minute)                     | Re cost of works, and votes.   |
| 92-324           | 15 „ 1892     | Carter & Co. (letter) to Engineer-in-Chief.   | Enclosing claim for £4,050 9s. 6d.   |
| 92-382           | 15 „ 1892     | J. Barling (minute) .....                     | Minute on letter from Council Clerk, M'Donaldtown.   |
| 92-387           | 23 „ 1892     | J. Barling (letter) .....                     | Letter to Mr. Abbott, M.P., re resumption of works.  |
| 92-409           | 27 „ 1892     | Carter & Co. (letter) to Engineer-in-Chief.   | Applying for refund of security deposit.   |
| 92-433           | 2 Mar., 1892  | J. Davis (minute) .....                       | Recommending that above request be granted.  |
| 92-490           | 5 „ 1892      | T. F. Waller .....                            | Report on M'Namara's claim.  |
| 92-644           | 25 „ 1892     | Carter & Co. (letter) .....                   | Asking that time penalties be remitted.  |
| .....            | .....         | J. Davis .....                                | Minute thereon.  |
| 92-771           | 5 April, 1892 | R. R. P. Hickson (minute) to Under Secretary. | Recommending that Contract 72 be proceeded with by Carter & Co.  |
| 92-912           | 28 „ 1892     | J. Davis (minute) .....                       | Recommending that the Department pay one-third cost of turning water out of sewer.   |
| 92-904           | 27 „ 1892     | Parry and Farley (letter) ..                  | Offering to do same on above condition.  |
| 92-2000          | 8 Sept., 1892 | J. Davis (minute) .....                       | Recommending repair of rendering in invert of sewer.   |
| 92-2405          | 1 Nov., 1892  | Carter & Co. (letter) .....                   | Offering eleven gratings at 50s. each.   |
| .....            | 8 „ 1892      | R. R. P. Hickson (letter) to Carter & Co.     | Willing to accept same at 45s. each.   |
| 92-2456          | 12 „ 1892     | Carter & Co. (letter) to J. Davis.            | Asking for remission of time penalties (£100).   |
| 92-2459          | 14 „ 1892     | J. Davis (minute) .....                       | Recommending remission of same.  |
| 93-4             | 31 Dec., 1892 | S. H. Weedon, Resident Engineer (minute).     | Report in connection with final certificate.   |
| 95-273           | 5 Mar., 1895  | W. Piper (memo.) .....                        | Informing Mr. Hungerford that the £316 12s. 6d., re M'Namara v. Smith, had been charged to "Reclamation and dredging, Loan Act, '94, No. 2." |

9083. You have read the minutes relating to Contract 79, upon pages 270 and 271 of the printed Parliamentary papers? Yes.

9084. You will see that the minutes go up to 22nd February, 1892, when the contract was supposed to be gazetted for re-tendering? Yes.

9085. Upon the following day, Mr. Hickson wrote a minute to the effect that Carter & Co. had a claim in connection with Contract 72, which they were willing to forego if they obtained Contract 79? Yes.

9086. Will you read the result of the investigations you have made as to the position in which that claim stood, and as to its validity? Yes; they are as follows:—

## MEMO. No. 5.

Re the letting to Carter & Co., Contract No. 79 (North Shore) without re-tendering.

(a) Tenders for Contract No. 79 were originally invited for, and received on, 10th June, 1891. The lowest tender was that of Messrs. Bond and Hudson, £36,900 (on schedule prices). The next lowest was Carter & Co's., at £39,890.

The Tender Board recommended the acceptance of Messrs. Bond and Hudson's tender.

(b) The papers show that Messrs. Carter & Co. and Messrs. Gummow and Gillan jointly signed a letter dated 10th June, 1891, protesting against the contract being given to Messrs. Bond and Hudson. But as the ground for objection was not sufficient, and of so old a date, the recommendation of the acceptance of Messrs. Bond and Hudson's tender was not withdrawn.

(c) From the evidence that has been taken by the Commission in this matter, Mr. Bond was to finance and attend to the financial part of the undertaking on certain terms agreed to by Mr. Hudson. Mr. Hudson was possessed of the practical experience for carrying on the works, but was not a business man or accustomed to office matters, correspondence, &c.

(d) Though the Tender Board had recommended that Messrs. Bond and Hudson's tender be accepted, no acceptance was ever notified to that firm.

The matter was submitted for the Minister's decision on 13th July, 1891, and again on 19th August, 1891, and the Minister, on 21st August, 1891, made a minute as follows:—"Inform must stand over until the question of further loan expenditure has been determined." And there is a minute—"Ordered to stand over.—J.B., 7/9/91." Following the date of this last minute comes the letter of Mr. C. B. Bond (Bond and Hudson), dated 28th September, withdrawing the tender and asking for a return of the deposit (£369). The minute on this letter is—"Return deposit.—J.B., 2/10/91." But there is no evidence of Ministerial sanction.

In the précis of the case dated 29th January, 1892, it is stated that the £369 tender deposit was returned to Mr. Bond on 7th October, 1891.

(e) One day prior to the date of the deposit being returned, namely, on 6th October, 1891, Mr. Hickson asked for the papers, and wrote a minute recommending that fresh tenders be invited. This recommendation is marked "Submitted, J.B., 9/10/91." But owing, it would seem, to changes in the Ministerial head of the Department, Mr. Hickson's minute of 6th October, 1891, was not dealt with until "Approved, W.J.L., 22/2/92." Then advertisements calling for tenders was ordered to be inserted in the *Government Gazette*, tenders to close 9th March, 1892.

(f) But on 23rd February, 1892, Mr. Hickson wrote a minute recalling his recommendation for fresh tenders, and recommended that Messrs. Carter & Co. be given the contract without any further competition. The reasons stated by Mr. Hickson are set out in his minute at page 271, as follows:—"Since writing my minute of 6th October, 1891, complications have arisen with Carter & Co., re their Contract No. 72 having been stopped. They have made large claims on this account, some of which, no doubt, could not be entertained, but on some items they have made a good case. They are prepared, if they obtained this work, to waive all claims on No. 72. As their tender is a reasonable one, and some £3,600 below the estimate, I think it might fairly be accepted. If this course were adopted, work would be given at once to a large number of men.—R.H., 23/2/92. Under Secretary. Important."

Mr. Hickson's minute is marked to the Under Secretary, and the Minister's minute, dated 23rd February, 1892, is as follows:—"As Mr. Hickson thinks Messrs. Carter & Co. could make good a claim for something like £2,000 as compensation on Contract 72 (Moni-street, partly), should they be willing to forego this claim, their tender may be accepted for construction of the main outfall sewer, North Sydney—£39,890, as worked out at schedule rates. If this firm will not agree to the condition imposed, fresh tenders to be invited.—W.J.L., 23/2/92.

(g)

G. Christie.  
15 July, 1896.

(g) The negotiations with Messrs. Carter & Co. appear to have been completed on 10th March, 1892, as on that date their tender, dated 10th June, 1891, was accepted (after an interval of nine months). Had the decision of 22nd February, 1892, to call for fresh tenders for 9th March, 1892, been adhered to, the fresh tenders would have been dealt with without any more delay than thus did actually occur.

(h) As the "claim" made by Messrs. Carter & Co. in connection with Contract No. 72, the withdrawal of which was made the condition of their being given Contract No. 79 without re-tendering—this claim first appears in a definite form on 15th February, 1892, eight days prior to Mr. Hickson's Minute of 23rd February, 1892, on which the re-tendering was stopped. The claim amounted to £4,050 9s. 6d., and was stated to be for loss consequent upon the stoppage of the contract works at a certain point, and is as follows:—

Copy of Carter & Co.'s Claim in re Contract No. 72.  
Losses by Withdrawal of Contract Work.

|  |                   | Rate. | £     | s. | d. |   |
|--|-------------------|-------|-------|----|----|---|
| Rent of Knight's Paddock.....                            | 40 weeks ..       | 5/-   | 10    | 0  | 0  | Required for storage purposes, Macdonald-street.                          |
| Sandstone for Concrete broken and stacked.               | 1,000 c. yds. ... | 8/-   | 400   | 0  | 0  | Material purchased before withdrawal of work.                             |
| Portland Cement .....                                    | 1,300 casks ...   | 14/9  | 958   | 15 | 0  | Do do   |
| Do loss on sale.....                                     | 2,000 „ ...       | 2/6   | 250   | 0  | 0  | Do do   |
| Gratings .....   | 25 „ .....        | 70/-  | 87    | 10 | 0  | Do do   |
| Man-hole Covers .....                                    | 4 „ .....         | 150/- | 30    | 0  | 0  | Do do   |
| Interest on Expenditure, £3,211 5s. ...                  | 3 months. ...     | 8 %   | 64    | 4  | 6  | Do do   |
| Valuation of Plant on ground for completion of Contract. | .....             | ..... | 500   | 0  | 0  | Cost of cement sold is included in £3,211 5s.                             |
| Loss of Profit on work withdrawn ...                     | £7,000 .....      | 25 %  | 1,750 | 0  | 0  | The greatest profit would have accrued from this portion of the Contract. |
|  |                   |       | 4,050 | 9  | 6  |   |

(i) By letter dated 13/10/91, Mr. Hickson notified Messrs. Carter & Co. that they were not to proceed with the works on Contract 72 beyond a certain distance, and stopped the works from that point in accordance with Clause 3 of the specification. This Clause 3 reads as follows:—

3. It is to be understood that the lower 13 or 27 chains of the channel shall not be constructed until the Engineer gives a written order to that effect; and the Engineer shall have the power to suspend the execution of these portions of the work, or any part of the contract, or to reduce the length of the contract by the extent of the said 13 or 27 chains, or any other part of the sewer shown on the drawings that he may consider necessary, and the contract shall not thereby be invalidated, nor shall the contractor be entitled to any compensation on account of such temporary suspension of any part or parts of the contract or permanent reduction of same.

This clause was specially inserted to allow of the works being stopped at a certain point, on account of the money not being available to carry on the further construction, consequent on the cost of the whole of the works exceeding the Vote.

Messrs. Carter & Co. tendered on this specification with a full knowledge of its contents, and furthermore they had had an extra piece of work to the extent of £ , which had not been originally included in the contract.

(j) The contractors had early notice of the Department's intention to stop the works at a certain point. And it is difficult to conceive, in view of the special clause, No. 3, of the specification, how their claim for £4,050 could ever have been in any way seriously entertained by the officers of the Department, particularly as those officers knew that the work was only temporarily suspended, and that it was their intention to proceed with the work so soon as money was available.

(k) But the matter becomes a very serious one if at the time the Minister on the recommendation of his officers gave Messrs. Carter & Co. an advantage in securing contract 79 without further competition, believing that by so doing he was settling a claim and saving a payment on contract No. 72 of some £2,000—if at that time the officers were aware that the work on contract 72 would soon be proceeded with, and that consequently Messrs. Carter & Co. could not then have even an excuse for a claim.

The Minister's minute is dated 23/2/92, but it is not final, and, in fact, the negotiations were proceeding till 10/3/92, the date when the acceptance of Messrs. Carter & Co.'s tender was notified to them by letter.

There is evidence that on 23/2/92, and on subsequent dates up to 10/3/92, those officers were satisfied in their own minds that the remainder of the works comprised in Contract 72 would shortly be proceeded with. This is shown by the Minutes on the following papers:—

92-387. Minute on letter from Mr. J. Abbott, M.P., who was urging, on behalf of his electorate at Macdonaldtown, that the work be proceeded with. The Minute refers to Mr. Barling's reply 23/2/92, which is as follows:—"Dear Mr. Abbott,—The sum required to finish the Munni-street Storm-water Sewer will be placed on the Estimates, but Mr. Lyne desires me to say that he will not be able to deal with the matter until they are passed, which will, however, now I presume, be now in a short time. Yours, with kind regards.—J. BARLING."

92-382. Minute on letter from the Council Clerk at Macdonaldtown, who asks that the Minister might receive a deputation relative to the stoppage of the construction of the Storm-water Sewer, Munni-street. The Minute is initialled J.B., 25/2/92, and is as follows:—"May perhaps be informed that there is no need for a deputation, and that as soon as the additional money required is voted the work will be proceeded with."

Further, seeing that the "Loan Act, 1892, 55 Vic., No. 35," which contained the required item of £9,000 for Contract 72 (see item "Sewerage Branch—Munni-street to Shea's Creek, storm-water channel, further sum, £9,000"), passed the Legislative Assembly on the 24th March, 1892, the officers of the Department must have been aware on the 23rd February, 1892, and subsequent dates prior to 10th March, 1892, that the work on Contract No. 72 would very shortly be resumed. As a matter of fact, Mr. Hickson's minute, 5th April, 1892, recommended that the work on Contract No. 72 be resumed by Messrs. Carter & Co.

(l) Messrs. Carter & Co.'s claim is dated 15th February, 1892, and was marked by Mr. Hickson to Mr. Bagge for report on 18th February, 1892. Mr. Bagge sent it to Mr. Davis for report on 22nd February, 1892. Mr. Davis returned the papers on 26th February, 1892, with the following minute:—

"This matter has now been settled. I understand the contractors have signed the office measurements accepting them."

It would thus appear that on 22nd February, 1892 (when Mr. Hickson advised the Minister that he thought Messrs. Carter & Co. could make good a claim for something like £2,000 as compensation on Contract 72), that the documents were not with Mr. Hickson, and that the claim had not been looked into or reported on, nor has it at any subsequent date so been dealt with.

(m) It has been stated in evidence before the Commission that Mr. Bond, without Mr. Hudson's knowledge, withdrew the tender of Bond and Hudson; that Mr. Bond received £1,500 for so doing, and that Mr. Kenwood (Mr. Bond's son-in-law) was paid £200 for negotiating the matter.  
Sydney, 15th July, 1896.

GEO. CHRISTIE, F.S.A.A.

9087. *Mr. Parkes.*] Upon what date were the last payments made after Contract 72 had been stopped by the minute of Mr. Hickson? The certificate, I see, is dated 20th January, 1892.

9088. And Contract 79 was let in March? Yes.

9089. You have in paragraph I of your memorandum referred to clause 3 in the specification of Contract 72—that is a special clause, is it not? Yes.

9090. To meet this special case? Yes.

9091.

9091. Will you read the letter of Mr. Hickson withdrawing the work from Carter & Co. for a time—the letter dated 13th October, 1891? Yes. It is as follows:—

Gentlemen,

With reference to your contract, No. 72, Sydney Sewerage Works, Munni-street, Shea's Creek, south-west channel, I have the honor to inform you that, in accordance with clause No. 3 of the specification, which gives me power to make such permanent alterations as may be considered necessary, I have decided to terminate the contract after the construction of the junction chamber and connection with the Macdonaldtown Park storm-water channel at 41.30 chains, thereby omitting that portion of the contract from such junction upwards to the point of termination of the sewer, as shown on drawings at Union-street, and hereby give you notice that the Munni-street storm-water channel is not to be carried on beyond the before-mentioned junction.

That is a copy of Mr. Hickson's letter.

9092. Will you read Mr. Hickson's minute of 5th February, 1892? Yes. It is minuted to the Under Secretary, and is as follows:—

TENDERS were opened in February, 1891, for sewer from B to E, the lowest being that of Messrs. Carter & Co. for £20,650 at per schedule rates. This tender was accepted on the understanding that the cost of the work be reduced so as to bring the cost of the work within the amount allowed without reference to the Public Works Committee. At the commencement of the contract the sum of £15,500 was available, and this was proposed to be expended on the work between the Mitchell Road and Munni-street (C to E on sketch), a clause allowing a reduction of the work, A to C, being inserted in the specification. On starting the work, however, it was found that there was no outlet to the sewer at Mitchell Road, at C, and a channel had to be cut along the proposed course of Shea's Creek canal, A to B, at a cost of £4,000, to provide an outlet, and the sewer continued from Mitchell Road (C) to the commencement of the outlet channel (B), at a cost of £8,000. This unavoidable construction of the sewer in the first instance from A to D exhausted the funds, and that portion of the work from the Macdonaldtown Park junction, at D, to the point of commencement at Munni-street (E), which formed part of the original contract, has had to be omitted for the present.

9093. The date of the last certificate paid after the stoppage of the work was 20th January, 1892? Yes; and it was passed on 3rd March.

9094. What was the vote available? From particulars which Mr. Hungerford has given me I gather that it was £15,500.

9095. What was the total amount given upon the certificate? The total amount of payments to the date I have mentioned was £17,674.

9096. That exceeds the vote? Yes.

9097. Will you explain where the money came from which was not in that vote? The amount paid to the contractors out of the vote of £15,500 is set down as £14,968 18s. 6d., the balance of the £15,500 having been expended on payments for supervision, so that the vote was exhausted after payment to the contractors of the amount I have named. The further money was drawn from the Macdonaldtown Park sewer vote of £8,500. The sum of £2,465 is set down as having been drawn.

9098. Therefore the contract was really proceeding? Well, money had been found to proceed with it beyond the vote of £15,500. I think that a portion of this money may legitimately have been charged to the other vote. Extra work was done by the contractors which was not in the original contract, and it may be that some of it was chargeable to the Macdonaldtown Park sewer vote of £8,500.

9099. Will you read the minute of Mr. Hickson under date of April 5th, 1892, ordering the work to be proceeded with? Yes. It is as follows:—

Now that the necessary funds (£9,000) are voted for this work, I should be glad to have authority to continue the sewer which was stopped some months ago for lack of funds. The contractors have kept some of their plant and a lot of material on the ground. There is nothing, therefore, to prevent the work, which is much needed, being gone on with at once, and thus provide employment for a considerable number of men.

9100. What was the date of the signing of Contract 79? 10th March, 1892.

9101. And the minute ordering the work to be proceeded with in the case of Contract 72 is dated 5th April, immediately upon the passing of the Loan Act? Yes, that was passed on April 1st.

9102. Touching the claim of the contractors in respect to the stoppage of Contract 72, there is an item of 3,300 casks of cement. I believe you saw the sum totals worked out by Mr. M'Creddie and Mr. Thompson as to the cement used after the contract was restarted? I could not give evidence as to that. I was here yesterday, and heard a certain quantity mentioned. I have not seen their reports.

9103. Will you look at the 9th progress-return in connection with Contract 72 and tell me the quantity of sandstone concrete and cement facing paid for at that date? Item No. 5, sandstone concrete, gives 6,015 cubic yards as having been paid for, and item No. 6, cement facing; gives 8,175 square yards as having been paid for.

9104. Will you look at the final certificate in the printed Parliamentary papers and tell me what quantities were ultimately paid for? 8,372 cubic yards of sandstone concrete, and 12,324 square yards of cement facing.

9105. There being a difference of what between the two payments? In the case of the sandstone concrete a difference of 2,357 cubic yards, and in the case of the cement facing a difference of 4,149 square yards.

9106. Which would absorb a great quantity of cement? I could not say what quantity.

9107. Have you prepared a memorandum as to the quantity of cement to be used upon the contract according to the specification and the quantity which was actually purchased? I have not the memorandum complete yet, but I will complete it.

9108. Have you prepared a memorandum as to the nature of this claim in connection with Contract 72? I have not prepared a memorandum, but I have examined the claim carefully, and am in a position to answer any questions in reference to it.

9109. Do you think there really is any claim in connection with Contract 72? You mean, I suppose, from the legal aspect under clause 3?

9110. Yes? In the first place, under clause 3 no claim could arise.

9111. As regards the various items given to sustain the claim, are any of them tenable? Some of the items are small.

9112. Are there any of them which could be made good, regarding them in the light of your experience as a business man? Taking clause 3 strictly I should say that none of them at all had been sustained.

9113. *Mr. Smith.*] Do I understand you to say that you have read carefully not only the papers which were not printed, but also those which were printed? I have perused them carefully. I have gone specially into them.

9114. As regards your first memorandum, you say that it is the result of careful perusal? Yes.



G. Christie. 9115. With regard to paragraph C of that memorandum, do you say that it is absolutely correct? I have every reason to believe so.

15 July, 1896. 9116. You have come to the conclusion that some of these papers were wilfully and knowingly withheld? Yes.

9117. When you drew up that memorandum, did you know that Mr. Barling, the Under Secretary for Public Works, at that time had sworn here that he gave instructions that all the papers should be printed? No.

9118. Did you know that Mr. Hungerford, the officer charged with the preparation of the papers for Parliament, had also given evidence to the same effect, and that both of them had denied that any of the papers had been knowingly withheld? I am not sure that I knew that from the evidence or from the assertion of Mr. Hungerford.

9119. Do you know that he gave that evidence? I cannot say that I knew that any evidence had been given to that effect; but, even if it were, that would not affect my opinion.

9120. I suppose that, if certain papers were not asked for by the House, you would think that a sufficient reason for not including them in the printed papers which were laid upon the Table? I think that in this case the order was generally for all papers in connection with these contracts. The order was in these terms:—

Copies of all papers and correspondence in connection with the contracts of Messrs. Carter, Gummow, & Co., at Marrickville, Balmain, North Sydney, Johnstone's Creek, and Stanmore, including the specification, schedule, &c., for original contracts, and for substituted ones, and all vouchers paid and details of same, and such other matter included in the transactions, from commencement to the present date.

9121. Is there one word in that order referring to papers of Contract 72? The order does not mention 72, nor give the number of any contract, but it mentions the Marrickville contract, and it is possible that the papers in connection with Contract 72 may come in under that heading. But the important point is this, that, whether they do or do not come in under the heading of the Marrickville contract, they do come in at North Shore. It is in that respect that the papers are deficient.

9122. But the order of the House makes no reference to the papers? Yes.

9123. In what way? It says, "and such other matter included in the transactions from the commencement to the present date." That being so, I say that the papers in connection with Contract 72 come in under the heading of the North Shore Contract, 79.

9124. You think it would not be a fair conclusion to arrive at, upon the reading of that order, that the papers relating to Contract 72 should be omitted altogether? I think the papers are necessary in connection with Contract 79 at North Shore, and that contract is referred to in the order. All the papers relating in any way to that contract should be given.

9125. Now that your attention has been specifically drawn to the terms of the order, do you still adhere to your conclusion that these particular papers were wilfully withheld? Yes, and the Department evidently considered that the papers relating to Contract 72 should have been included, by themselves putting in some of those papers. They should have put in the whole of the papers relating to Contract 72, but they have left out very important matters in connection with that contract. The papers purport to include the papers relating to Contract 72, but they do not do so, and to that extent they are misleading.

9126. Clause (c) of the first memorandum you read to day contains these words: "No information was conveyed to Parliament by the papers that the works had been stopped by the Department for the four months preceding the agreement dated 19th April, 1892, under which the extension of time was granted";—is that true? Yes.

9127. Would it not appear from a minute, which you will see on page 271 of the Parliamentary papers, that Parliament was informed that the work had been stopped? There is that slight indication.

9128. So that it would be incorrect to say that no information had been given to Parliament on the point? There is that slight indication of information embedded in a minute.

9129. Is there not a special reference to it on the minute on page 271? Yes; it is embedded in a minute.

9130. Will you read the second clause of that paragraph? Yes. I see it states that the contractors have made claims.

9131. And you still say that in these papers there is no information that the contractors had made a claim for this sum of £4,050? I had not seen that.

9132. Have you read an agreement of the 10th March, printed in the Parliamentary papers upon page 272? I have not read it in this connection.

9133. You will observe, first of all, as to the parties, that it is an agreement made between John Carter, David Snodgrass, and George Forrest? My memorandum has reference to the papers of Contract 72, not to the papers of Contract 79.

9134. But you say that the Parliamentary papers convey no information that this claim had been made? I said the printed papers in connection with Contract 72 did not convey the information. That is where the papers bearing upon the matter should have been.

9135. But is there not upon page 272 a recital of the fact that these contractors had made a claim for the sum of £4,050? I am dealing with the papers of Contract 72, and this reference is embedded in an agreement in the papers of Contract 79. There is some reference to the matter in this agreement, but there are no other subordinate papers, as there should have been, leading up to it. I wish it to be distinctly understood that my memorandum deals specifically with the papers of Contract 72, and, if the Department professed to include all the papers in connection with that contract in this return, then the whole of the papers should have been included.

9136. Let me refer you to page 278—you will find there a letter in which Carter & Co. agreed to forego all claims to compensation in connection with Contract 73;—that is not embedded in anything; it stands out by itself? Yes, but it might refer to general things, whereas I am dealing with Contract 72; and I say that all the papers in connection with that contract should have been included in this return—in the few papers which are given in connection with it. Either the whole of the papers should have been given, or none at all. Anyone reading that letter would say that it related to general matters; no specific amount is mentioned.

9137. Does it not strike you that the printing of the contract of 72 and the final voucher of 72, although no papers in connection with that contract were asked for, was simply because of this recital bearing upon Contract 79? No.



G. Christie.  
15 July, 1896.

9138. You do not think that would be a valid reason? No, because the Department have, in the case of other contracts, given voluminous papers upon all matters of detail, and in this case, where there is really something important, those matters are omitted.
9139. I think your evidence, as to the claim made by Carter & Co. in respect of the stoppage of Contract 72, was that the claim was not legally sustainable? Clearly that is my opinion.
9140. Does that opinion refer to the whole of the items? I think to everyone of them.
9141. And you think that, although the work was stopped in the way indicated, the contractors have no claim to compensation at all? Yes.
9142. *Mr. Gummow.*] You referred in your evidence to a voucher dated 20th January, 1892, in connection with Contract 72? Yes, to a certificate of that date.
9143. Did you notice the prior certificate? Yes; the 8th progress return.
9144. What is the date? It is a return of work to the 30th November. A comparison of these vouchers did receive my attention at the time.
9145. Why did you not refer to it in your memorandum? The position of matters is this—there is a considerable advance in the amount allowed to the contractors upon the January certificate as compared with the amount allowed in November. I had the figures of the two vouchers side by side.
9146. What is the quantity allowed for sandstone concrete in the November certificate, and the quantity in the January certificate? I have not dealt with quantities, but only with amounts. My object was to see whether it was apparent that any more work had been done between the 30th November and 20th January. My deduction from the amounts shown upon each certificate is that work must have been done.
9147. Will you read out the amounts? Yes; I find that the amount upon item No. 5, sandstone concrete, in the 8th progress return, is £10,213 12s., as against £10,226 14s. 6d. in the 9th progress return. In the case of cement facing the amount given in the 8th progress return is £638 12s. 6d., and in the 9th progress return £1,021 17s. 6d.—a difference of £370 on that one item.
9148. Will you give me the quantities? Yes; in the 8th progress return the quantity of sandstone concrete is 6,008 cubic yards, and in the case of the 9th progress return 6,015 cubic yards—a difference of 15 yards. The cement facing upon the 8th certificate is given as 5,109 square yards, and in the 9th certificate 8,175 square yards—a difference of 3,066 square yards. It would seem from that item of cement facing that there must have been a considerable addition to the works certified for in the 9th progress return as compared with the 8th progress return.
9149. In other words the January certificate was a general cleaning up of work which had been done up to November, 1891? I do not think you could say there was a general cleaning up as regards cement facing.
- 9149½. Are you sure it was not so? I am only going from the figures upon which the previous payment was made—5,109 square yards. You will see that there is an addition of 3,066 square yards—an addition of 80 per cent.
9150. But take the concrete;—was any concrete work done? I should think not. The second quantity would be a more exact measurement probably.
9151. Have you any idea as to how much cement it would take to do 3,000 square yards of rendering? I am not dealing with that aspect of the question.
9152. Upon the question of cement the Department, according to your evidence, gave Carter & Co. notice in October, 1891, that this job at 72 contract would be stopped? That is the date of the written notice.
9153. Do you consider that Carter & Co. could have stopped their orders for cement as soon as they received this notice from the Government;—could they have stopped their orders on receipt of that notice? The position is this—Carter & Co. had a certain specification with the Department, and it was their duty to look ahead and see whether they would have to go on with the work or not.
9154. Suppose Carter & Co. had a contract with certain merchants for the supply of 5,000 or 10,000 casks of cement, could they suddenly abrogate that contract and stop the supply? Cement is always saleable at 6d. per cask reduction.
9155. Are you sure of that? Yes.
9156. Does not the price of cement vary in different months? Yes; but if 6d. per cask is taken off you can always sell a thousand casks of cement.
9157. You mean off the price at that particular time? Yes.
9158. Does not the price of cement vary very suddenly sometimes? No. There are advices from London, and cement merchants know how the market is going. They know the shipments to arrive, and there is no unlooked-for change in the price.
9159. If there is no cement in the market does not the price vary very suddenly? Yes, it may do sometimes.
9160. But does not that often occur? No.
9161. Has it not affected other contractors according to your previous evidence? That was tested cement. There would be plenty of other cement in the market.
9162. *Mr. Parkes.*] Mr. Smith asked you with reference to an agreement which appears in the papers for the carrying out of the second section of Contract 72, whether mention was not made in the papers of the claim of the contractors? Yes.
9163. Does not the presence of that agreement in the papers afford a strong reason for the inclusion of the other papers bearing upon Contract 72? Yes, it would seem to do so.

William John Lyne sworn and examined:—

9164. *Mr. Parkes.*] Do you recollect the date upon which you became Secretary for Works in the last administration of Sir George Dibbs? In October, 1891, I think, but I am not sure. The Blue Book will tell you.

9165. Do you recollect Contract 79, one of the North Sydney Sewerage contracts, being let to Carter & Co.? I do not recognise the contract by the number, but I know as a matter of fact that Carter & Co. had a contract at North Sydney.

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W. J. Lyne. 9166. To refresh your memory, I will read to you a minute which you made at that time:—

15 July, 1896. "As Mr. Hickson thinks Messrs. Carter & Co. could make good a claim for something like £2,000 as compensation on Contract 72 (Mori-street, partly), should they be willing to forego this claim, their tender may be accepted for construction of the main outfall sewer, North Sydney—£39,890, as worked out at schedule rates. If this firm will not agree to the condition imposed, fresh tenders to be invited.—W.J.L., 23/2/92."

Do you remember that? Yes.

9167. Had you any conversation with Mr. Hickson before writing that minute? I think the chances are that I had.

9168. Do you recollect the occurrence? I do not remember any special conversation at that time, but upon an occasion of that sort I certainly should have had a conversation with Mr. Hickson before I dealt with the matter.

9169. Did you know at that time that a claim was being made by the contractors in respect of a contract which was started a month and eight days afterwards? I do not remember the circumstances at the present time.

9170. Do you recollect Contract 72 being re-started? I do not recollect it by the number. In any case, it is so long ago that I am afraid that I should not have a distinct recollection of what took place. I do remember writing the minute which you have read, and I remember that that amount of £2,000 was a consideration with me in determining whether the other contracts should be proceeded with by this firm. I wished to avoid any litigation or trouble.

9171. Did Mr. Hickson tell you at that time that in Contract 72 a special clause had been inserted to this effect:—

"It is to be understood that the lower 13 or 27 chains of the channel shall not be constructed until the engineer gives a written order to that effect; and the engineer shall have the power to suspend the execution of these portions of the work, or any other part of the contract, or to reduce the length of the contract by the extent of the said 13 or 27 chains, or any other part of the sewer shown on the drawings, that he may consider necessary, and the contract shall not thereby be invalidated, nor shall the contractor be entitled to any compensation on account of such temporary suspension of any part or parts of the contract or permanent reduction of same."

It is impossible for me to say now. I do not recollect the circumstance.

9172. If your attention had been directed to such a clause would you have sanctioned the letting of 79 to Carter & Co.? It depends entirely upon the circumstances. There may have been reasons why I should have done so. For instance, I may have been actuated by a desire to avoid litigation.

9173. The part of the specification which I have been quoting refers to the extent of the contract, and this special clause was put in to admit of a portion of the contract being deducted to meet the Loan Vote of £15,500? I do not understand how the contract could have anything to do with the meeting of a Loan Vote.

9174. Suppose we say the absorption of a Loan Vote—let me put it in that way? You mean to prevent the Loan Vote from being exceeded?

9175. Yes. Contract No. 72 was let at some £5,000 above the money available under the Loan Vote? Yes, I understand that.

9176. And in order to provide for that this special clause was inserted. If you had known of the existence of that clause would you have admitted the claim of the contractors? It depends entirely upon the circumstances. I do not remember at this moment whether their claim of £2,000 was made through the stoppage of the contract, under that or some other condition.

9177. Does not the condition I have read cover any stoppage of the contract? I thought you said the clause was put in to prevent the Loan Vote from being exceeded.

9178. Quite so. But if it had been brought under your attention and you knew that as soon as funds were available in the next vote this contract would be proceeded with, would you have admitted the claim of the contractors? I certainly would not have admitted it if that were the only reason,—that is, to prevent the Loan Vote from being exceeded.

9179. Take the various items constituting the claim—rent of Knight's paddock, £10; sandstone, for concrete, £400; Portland cement, £958; loss on sale of cement, £250; gratings, £87 10s.; man-hole covers, £30; interest on expenditure, £64; valuation of plant on grounds, £500; loss of profit on work withdrawn, £1,750—making a total of £4,050. If that contract were to be proceeded with do you think that any of these items would have been sustainable? I could not possibly say at the present time.

9180. Was this claim put before you? The chances are that it was. I should imagine that I obtained particulars of the claim. At all events I must have been satisfied that Mr. Hickson had had particulars of the claim before him, and I think it is very likely that the particulars were before me.

9181. If the contract were to be resumed within a month and eight days, there is no doubt that this claim would disappear? That I do not know. I do not know what Mr. Carter would have done, whether he would have absorbed all the material on the ground or not. I do not know whether the claim was absolutely for material which was to have been put into the contract, but which through its stoppage for the reason you have mentioned was not put into it.

9182. Have you any clear recollection of what took place at that time? Not in reference to that part of the matter.

9183. In all these matters, did you depend absolutely upon your officers? To a very large extent. There may have been certain circumstances of which I was aware myself, and, if in such a case I felt that I was justified in deviating at all from the recommendation of my officers, I should do so unhesitatingly; but in the majority of cases—in fact, in nearly every case, and especially where large contracts were concerned—I depended upon my officers, and especially upon Mr. Hickson.

9184. Is it not the custom in the Works Department, when there is a good margin between the lowest and the next tenderer, and when the lowest tenderer throws up the contract, to call for tenders again? No.

9185. Are there any instances to the contrary? There are some instances, but the matter generally goes before the Board of Reference, and the Board would give reasons for calling or not calling for fresh tenders.

9186. Would it not leave an opportunity for fraud to be perpetrated upon the State by one contractor purchasing off another? If anything of that kind came to the knowledge of the Board, or myself, of course the next tender would not have been accepted; but, if it were a *bona fide* case where a man might have miscalculated his amounts, then you would have a different state of things. In some cases the tenderers not only in sewerage but in road works do miscalculate their amounts. In numerous cases of road

- road and bridge contracts it has been clearly shown that the tenderers miscalculated their items, and under those circumstances it would not have been a fair thing to compel them to carry out the work.
9187. Would it not be a fair thing under such circumstances where a contractor had thrown up the contract to call for fresh tenders? Not if there were special reasons to the contrary. Suppose the departmental estimate were lower than the tender of the next contractor, that might be a reason for calling for fresh tenders, but, if the departmental estimate were higher than the next tender and the amount given happened to be a fair amount for the work, it might be given to the next tenderer.
9188. Is the departmental estimate more reliable than the competition of contractors? It often is.
9189. Are not the departmental estimates generally in excess of the tenders that come in? In some cases they have been less.
9190. But it has not been so in the case of these sewerage contracts? You must recollect that the sewerage contracts form but a small proportion of the contracts of the Department. The roads contracts are at all events the most diversified contracts the Department has.
9191. This was a contract of £40,000? You will find that what I say has often happened in the case of road contracts.
9192. Would not it be a safer plan to call for tenders again? That may or may not be so. One thing that often guided me was this—if a man or a firm had been tendering and doing work for the Department for a considerable time, and the Department had come to know that the firm or the man were good contractors, carrying out their work well, I would rather give the contract in a case such as you mention to such men, and save the Department trouble and perhaps loss from litigation. I would rather give a contract in such a case to a man of that kind than to a man who is always litigating. I know we had one case in connection with the railways where a contractor gave us no end of trouble upon every contract he had—so much so that I made up my mind never to give him another contract. It would cost us more through litigation than if we had given the contract to a man who tendered at a higher price. I am mentioning now one of a number of cases of the kind.
9193. If you had known that in this instance Carter & Co. had bought off Bond, the lowest tenderer, for £1,500, would you have sanctioned this business? I do not think I should. I cannot say definitely, but my impression is that I should not.
9194. Would it not have occurred to you that the State would suffer to the extent of £3,000 by the acceptance of Carter & Co.'s contract when the Department might have accepted a tender £3,000 less? It may not have suffered, because the man who tendered at £3,000 less may not have been able to carry out the work. If you have a man who is not able to carry out a work, you do not know where the expense of compelling him to do so is going to end.
9195. Suppose he puts up a £2,000 bond? That would be a reason for supposing that he could do the work, but a £2,000 bond in the case of a £40,000 contract is not much.
9196. It is provided in the specification? Yes, but £2,000 is not very much when you are considering the carrying out of such a large contract.
9197. Supposing the contractor were a substantial man such as Mr. Bond was? If I knew him to be a substantial man I should not have given the contract to another contractor. In any case I might not have done so had I known that the lowest tenderer had been bought off.
9198. Is it not the custom of the Works Department to have in all cases a cash good faith deposit put in with the tender? That is the usual practice, but it has been varied, especially in the case of road contracts. I remember great complaints being made to the Department that if we required a cash deposit in the case of every road contract a number of small men would be debarred from tendering.
9199. But in the case of big contracts, is it not the invariable custom? Yes.
9200. If the contractor forfeits the contract, is the custom to return the deposit? As a rule, it is not done, but it has been done in some cases—cases, for instance, where a man might really have made a miscalculation. If it were due to no fault of his own I should not hesitate to return him the deposit.
9201. Do you remember the deposit of £369 being returned to Mr. Bond in this instance? I do not remember it.
9202. Was it done with your sanction? I suppose it would be; but the papers would probably show.
9203. Would you have agreed to the cancellation of the tender and the return of the deposit if the whole of the facts which I have mentioned had been put before you? If I had been fully aware that the lowest tenderers had been bought off, and that they could have carried out the work, I do not think I should have sanctioned it.
9204. Do you recollect Contract 72? No; I cannot say that I recollect that particular contract.
9205. Do you not remember it, being brought under your notice in connection with Contract 79;—do you not remember having a conversation with Mr. Hickson or any other officer of the Department about it? I do not recollect that particular contract, although I know that I saw most of the works. If you are referring to the contract which was the subject of litigation through the cutting off of water from some wool-washing works, I do remember it. I remember the circumstances of the litigation, but I do not remember anything in particular about the work itself.
9206. You do not recollect that contract being discussed in connection with the letting of Contract 79? No.
9207. Do you recollect seeing the paper which I now hand you in reference to that claim? I see there is no reference to the minute-book upon the paper. These matters were very often inserted in the authority-book of the Works Department, and in that case there would be a reference upon the paper. I may have seen the paper, but I did not deal with it in any way, or my initials would be upon it.
9208. I suppose Mr. Hickson did not put the particulars of this claim before you;—you would take it from his word that there was such a claim? I think the chances are that I knew something of the claim before I dealt with it, but I could not say positively. If Mr. Hickson told me that there was a valid claim of £2,000, or £4,000, or whatever the amount may be, I have no doubt that, unless there was something which would cause me to investigate the papers, I should not have gone any further into the matter, but should have accepted Mr. Hickson's recommendation.
9209. *His Honor.*] You would not have considered the claim at all in that relation unless it were represented to you that it was a valid claim? I certainly should have refused to consider the claim unless I thought it valid.
9210. *Mr. Smith.*] Coming to the question concerning Contract 72—supposing the contract had been stopped by the Government, and that the contractors had been stopped from working for (say) five or six months,

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W. J. Lyne. months, and that they claimed compensation in respect to that stoppage, would you not think it a claim which it would be advisable to settle if you saw a chance of settling it? Do I understand you to mean that the work might be indefinitely postponed under the clause quoted by Mr. Parkes?

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9211. I mean, independently of any special claim in that agreement? I certainly should think that the contractors, even if they had not a legal claim, would, at all events, have a moral claim for compensation.

9212. In the absence of a special condition in the contract? Yes.

9213. Supposing that special condition which was read to you referred to part of the contract which had not been begun at all at that time—to another part of the contract altogether—would you have thought that the claim was one which ought to be settled if you could settle it? Yes, assuredly I should. From what I can gather since I came into the room, I imagine that the contract could not have been stopped under the clause quoted by Mr. Parkes. The matter must have come before me, and if I had understood before hand that the work was stopped under that clause alone I do not think I should have consented to give anything.

9214. You said you acted, as a rule, upon Mr. Hickson's advice. Had you every confidence in Mr. Hickson as an officer of your Department? Every confidence, and I always have had.

9215. You have heard of nothing since you have left office calculated to shake your confidence in him? It would take a great deal to shake my confidence in Mr. Hickson.

9216. *Mr. Gummow.*] With regard to the return of the deposit to Bond and Hudson, in a letter written by Mr. Bond on 28th September, 1891, he says, "On June 10th of this year we had the pleasure of submitting a tender for the above works, and we believe were successful in being the lowest tenderers. We have been anticipating the acceptance of our tender for some months, but, not hearing from your Department, we have in the mean time entered upon other obligations, and must consequently respectfully ask you to permit us to withdraw our tender, and to return us the deposit attached thereto now lying in your hands." That letter is signed by Mr. Bond. Would not the fact of your having kept them waiting so long be a sufficient reason for the return of the deposit money? Certainly, I have done so in many cases where we could not get on with the work as we expected to do. At that particular time there was a difficulty in getting loan money, and I made arrangements in many cases for funded stock which we issued in the Colony to be taken instead of cash. Many delays of that kind arose at that particular time in connection with the carrying out of works in consequence of my desire to keep the Loan expenditure down as low as possible, without finding money from sources outside the vote.

9217. As to tendering through the tender-box, I presume you know that the whole of the tender prices are put up within an hour or two after the tenders go in;—you know that they are made public? Yes, after the Tender Board has examined them.

9218. In the event of the lowest tenderer throwing up the work, would you consider it fair to re-call for tenders after the exposure of everyone's prices;—would not that be unjust to the contractors? That is one thing which sometimes guided me. The Department should decide what they are going to do beforehand, and I do not think they ought to take it upon themselves to call for fresh tenders unless there be some special reason.

9219. Supposing the price were from 5 to 10 per cent. below the Government estimate, would that be a fair reason for accepting another tender? In most cases I should accept another tender, but the case put before me by Mr. Parkes was one in which the lowest tenderer had been bought off. In a case of that kind I should probably not accept another tender.

9220. If the lowest tenderer has been bought off, would the Department know of it? I did not know of it in this case; you may be sure of that.

9221. *Mr. Parkes.*] I should like you to read a copy of Mr. Hickson's letter under date 13th October, 1891, stopping the works upon Contract 72, and, having read the letter, to tell me whether, if you had had that before you at the time, you would have consented to the claim of the contractors? That would be a matter for investigation. I cannot say that I would not have consented to it, because I have very great doubt as to whether the clause you have read from that specification applies in the way in which it has been sought to make it apply.

9222. Read clause 3 again, and tell me whether you do not think it refers specially to this case. Mr. Hickson in his letter says, "I have the honor to inform you that, in accordance with clause 3 of the specification," &c.? The clause you have asked me to read refers, I take it, to a portion of the sewer beyond a certain point. It refers, further, to an alteration of the works in a part other than that in respect of which the contractors made their claim.

9223. If you had known of Mr. Hickson's letter referring to that clause in connection with the stoppage of the contract, would you have allowed the claim? I should not like to say positively one way or the other what I would have done. If Mr. Hickson advised me that the contractors had a valid claim I should have taken his advice.

9224. You did not know of the existence of this paper? No; I did not. There is one matter to which I should like to refer. I have seen in the newspapers some reference to the extension of the North Shore Contract. That is a matter which applies to myself as well as Mr. Hickson. Carter & Co. were carrying out the North Shore Contract, and—when they had about finished the work—there was an extension to be done. At that particular time there was a good deal of distress about. The men who were employed upon the contract were likely to be turned adrift, and the question arose as to whether we should invite fresh tenders for the extension or not. I think that was the only time I ever saw Mr. Carter or some other gentleman, whoever it may have been, connected with the firm. I inquired what the cost of the extension of the sewer would be, and I think they wanted £16,000 or £17,000. The departmental estimate was about £12,000 or a little over, but they would not, for some time, take the lower sum, and I spoke to Mr. Hickson about it. He was certainly in favour of inviting fresh tenders, which I should have done had they not eventually taken the contract at the departmental price. I think I did, in my minute, write that there was to be no claim of any kind for extras. I am not quite sure about it, but I think I made some minute of that kind. Even after I had practically made up my mind to do this, Mr. Hickson suggested that fresh tenders should be called; but I wished to get the work on as quickly as possible. Besides, Carter & Co. had a good record in the office. I looked upon them as one of the best firms of contractors we had for that class of work, and I decided to accept their tender at the departmental estimate. What I wanted to say, however, is that Mr. Hickson never influenced me in the slightest degree to do what I did. The course I took was rather in opposition to the course which  
Mr.

Mr. Hickson desired me to take. I knew all the circumstances in connection with the case, and I am quite prepared to take the responsibility for what I did. W. J. Lyne.

9225. *Mr. Gummow.*] Mr. Parkes read you a letter of Mr. Hickson's under date of 13th October, 1891, in reference to the termination of the contract, and in which no allusion is made to the giving of compensation. Is it not usual for the Department to write letters of that kind to contractors asking them to stop work, and is it not usual under such circumstances for the Government to allow the contractors to make a claim, if any foundation for such a claim exists, for compensation;—it is not usual for the Department to say, in writing such a letter, "We will give you compensation?" Certainly not. The Department is not at all anxious to pay compensation unless it is necessary that it should do so.

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9226. A letter of that kind may be bluff or it may not be bluff, but it is for the contractors to see whether they can make good any claim? Yes. Notice would be sent from the Department that a certain thing is to be done, whether by way of alteration in the work or by way of stoppage, and if the contractors have any claim they must endeavour to make it good.

9227. If afterwards Mr. Hickson received notice of a claim from the contractors, backed up by various evidence, could he not alter any opinion expressed in his letter of 13th October, and give you reasons, although you may not remember them at the present time, for entertaining a claim for compensation? His letter would not bind him absolutely, I should imagine. I probably had several conversations with Mr. Hickson about the matter. In a large Department like the Works Department, where the Minister's time is pretty well occupied, it is not the custom to put everything in writing. I suppose other Ministers have acted as I did. I frequently sent for a particular officer, and asked him to explain matters to me, and in such a case there would be nothing in writing.

9228. This letter of Mr. Hickson's, of 13th October, does not actually bind him with regard to any compensation which may be claimed? No. He would be quite at liberty to vary it afterwards. The Department can always vary matters of that kind if it likes. Of course the last letter bearing upon a matter of that kind would be taken to have the greatest force.

John Carter recalled and further examined:—

9229. *Mr. Parkes.*] You hand in a statement giving full particulars of landed property held by Carter, Gummow, & Co.? Yes; a memorandum of the firm's property, including all fixed deposits in Banks. It may be incomplete as to some of the legal details, otherwise it is quite complete. J. Carter.

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FRIDAY, 17 JULY, 1896.

George McCredie recalled and further examined:—

9230. *Mr. Parkes.*] You have perused the vouchers in connection with Contract 72? Yes. G. McCredie.

9231. The last voucher after the stoppage of the work was paid on January 20th, 1892? That is correct. 17 July, 1896.

9232. And you have ascertained the quantity of cement which would require to be used in the concrete and cement facing which has been done since that time? Yes.

9233. You saw the final certificate which was paid, in November, 1892? Yes.

9234. And you have taken out the quantity of cement used between the time of restarting the work and its completion? Yes.

9235. How many casks were used in the concrete and cement facing during that period? 3,432 casks.

9236. That is your report, is it not? Yes. In the final return the number of casks was given as 12,008, and in the ninth progress return the number given was 8,576, showing a difference of 3,432 casks.

9237. Therefore, if the claim made in October, 1892, contained an addition of 3,000 casks, that quantity would have been used in the interval between that date and the restarting of the works? Yes; that is the quantity which should have been used.

9238. According to your valuation? Yes.

9239. *Mr. Davis.*] Have you made your calculations for the concrete in this case on the same basis as your other calculations? Yes.

9240. You have estimated that 16 feet of bluestone metal would make 16 feet of concrete? Yes.

9241. And that 20 feet of sandstone would make 20 feet of concrete? Yes.

9242. *Mr. Parkes.*] You have put the three classes of concrete to a practical test within the last week? Yes.

9243. The concrete is not quite set yet? No.

9244. Still you are perfectly satisfied that your measurements are correct? Yes.

William Thompson recalled and further examined:—

9245. *Mr. Parkes.*] You have perused the vouchers in connection with Contract 72? Yes. W.

9246. You made a note of the quantities paid for at the time of the stoppage of the work? Yes, as shown by the ninth progress return. I have compared that with the final certificate. Thompson.

9247. And you have taken out the difference in the cement used during that period? Yes. 17 July, 1896.

9248. What do you make it? In the case of the sandstone concrete there is a difference of 2,356·59 yards, representing 3,181 casks of cement, and in the cement facing there is a difference of 4,149·79 yards, representing 237 casks of cement, making a total difference in the number of casks of cement of 3,418 casks. To that total may be added 21 casks for brickwork, making a grand total of 3,439 casks.

9249. You have made your report quite independently of Mr. McCredie? Perfectly.

9250. Had there been 3,000 casks of cement in the hands of the contractors at the time the works were restarted, that cement should have been used before they were completed? Yes.

9251. *Mr. Davis.*] I suppose you made your calculations upon the same data as those upon which your previous calculations were made? Upon exactly the same data as far as the quantity of cement is concerned.

William

William Henry Warren recalled and further examined:—

W. H.  
Warren.  
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9252. *His Honor.*] I believe you have made some researches in connection with the use of the Monier patent in public works, and are in a position to give us information with reference to the Monier system generally? Yes. In accordance with your instructions, I have written a report concerning the use of concrete with iron in the Monier and other similar systems. That report is as follows:—

THE use of concrete combined with iron in the Monier and other systems; by W. H. Warren, M. Inst. C.E., M. Am. Soc. C.E., Challis Professor of Engineering, University of Sydney.

CONCRETE in combination with iron or steel has been largely used during the last five or six years for a variety of purposes. In America the chief use made up to the present of this system occurs in the foundations of high buildings and in warehouse floors; but a few highway bridges have been constructed, consisting of concrete arches, in which iron or steel is used in combination with the concrete.

In Europe a large number of bridges have been constructed chiefly on the Monier principle, but there are several other methods which have been adopted both in America and Europe, among which may be mentioned—

- The Ransome concrete and twisted iron system.
- The Melan system.
- The Sidero cement (Bordenave system).
- The Wunsch system.

Probably the largest structure of this class in America occurs at Topeka, Kansas, where a fine arched bridge has been constructed over the Kansas River. The span of the central arch is 125 feet, and the width of the roadway and foot-paths is 40 feet over all. This bridge is constructed on the Melan system, which consists of steel ribs of the lattice-girder type, spaced 3 feet apart, centre to centre, and 26 inches deep, forming the metal skeleton of the bridge, filled in, and completely surrounded, with concrete. Probably the largest arch bridge yet constructed occurs at Munderkingen, in a road bridge over the Danube, and consists of a span of 164 feet, with a rise of 16.4 feet. The depth at the crown is 3½ feet, increasing to 3½ feet at the springing. In order to understand the function of the steel or iron in combination with concrete in arches, it is necessary to consider the stresses developed by the load in an ordinary arched bridge or viaduct. These consist of—

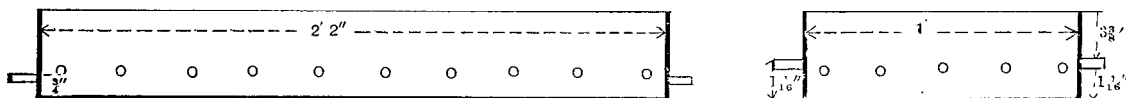
1. A compressive stress or normal thrust distributed uniformly over the area of the section of the arch.
2. A shearing stress at the section.
3. A bending moment, producing tension and compression on opposite sides of the neutral axis of the section.

The direct compression, combined with bending, produces an unequal distribution of stress over the section, which may be tensile at the intrados and compressive at the extrados, or conversely. The compressive strength of good concrete three months old may be taken at 1,600 lb. per square inch, while the tensile strength of similar concrete is about 160 lb. per square inch. These results are less than those obtained on small-size specimens. In the tensile tests the area under tension was 100 square inches, and in compression 144 square inches. The figures have been taken from a very large number of tests made on specimens prepared by the Sewerage Department in the University Testing Laboratory. The low tensile strength of concrete, compared with its compressive strength, has restricted its use in arches of large span, as failure would always occur by the fracture of the concrete under tensile stress. This has given rise to the various systems mentioned in which iron or steel is associated with the concrete in such a manner as to enable it to resist greater tensile stresses. One of the most extensively used of these systems is that introduced by Jean Monier, which consists of a wire-netting placed near the intrados in small arches, and near both intrados and extrados in large arches, in the body of the concrete, the sectional area of the iron or steel in tension being proportioned as much smaller than that of the concrete as its tensile strength is larger.

The iron netting used with the Monier system is not stiff in itself, and its co-operation with the concrete can be expected only after hardening. The following experiments were made at the University Testing Laboratory on slabs of mortar 26 inches long and 12 inches wide by 3⅜ inches thick. These slabs were supported at points 20 inches from centre to centre, and loaded in the centre until fracture occurred. The proportion of sand to cement was about 3½ to 1. In three of the slabs an iron network was placed 1⅛ from the lower side of the slab where tension was developed. The results of these experiments are given in the following table:—

CROSSBREAKING Tests of Monier Plate Mixings.

| Description.   | No.  | Proportions.      |       |        | Age in days. | Weight of specimen. | Breaking weight. | Modulus of rupture. | Age in days. | Weight of Specimen. | Breaking weight. | Modulus of rupture. |         |        |
|--|--|-------------------|-------|--------|--------------|---------------------|------------------|---------------------|--------------|---------------------|------------------|---------------------|---------|--------|
|  |  | Cement            | Sand. | Water. |              |                     |                  |                     |              |                     |                  |                     |         |        |
| Cement, Globe brand.<br>Sand, Nepean...<br>Dimensions:<br>2' 2"<br>1' 0"<br>0' 3⅜" | Made with wrought-iron—longitudinal bars, dia. ⅜", 2½" centres | 1                 | 1     | 3.50   | 0.918        | 36                  | 75.3             | 2,054.1             | 550.2        | 120                 | 75.3             | 3,091.2             | 834.42  |        |
|  |  | 2                 | 1     | 3.50   | 0.918        | 36                  | 75.3             | 2,025.0             | 542.5        | 120                 | 75.3             | 1,702.4             | 467.83  |        |
|  | Transverse bars, dia. ¼", 2¾" centres.                         | 3                 | 1     | 3.38   | 1.108        | 36                  | 75.3             | 2,737.3             | 730.1        | 120                 | 75.3             | 1,904.0             | 521.00  |        |
|  |  | 4                 | 1     | 3.50   | 0.918        | 36                  | 74.9             | 770.6               | 212.0        | 120                 | 74.9             | 1,388.8             | 384.86  |        |
|  |  | Made without iron | 5     | 1      | 3.50         | 0.918               | 36               | 74.9                | 660.8        | 183.1               | 120              | 74.9                | 1,433.6 | 396.69 |
|  |  |                   | 6     | 1      | 3.38         | 1.108               | 36               | 74.9                | 788.5        | 216.2               | 120              | 74.9                | 963.20  | 272.50 |



The average value of the modulus of rupture, or co-efficient of transverse strength, was 608 lb. per square inch with the Monier plates and 351 lb. per square inch with the mortar only, without the Monier network. These results are about the lowest I have ever seen recorded, and are probably due to the rough handling they received in loading and unloading from the cart, with a number of other large specimens of concrete which were tested at the same time.

It is unfortunate that these experiments were not repeated, as other results obtained by similar tests give values about twice as great for Monier beams.

THE strength of the Monier arch, as compared with concrete and brick arches, also with combinations of concrete and iron or steel, arranged in a special manner.

By far the most valuable information on this subject is supplied by the results of an exceedingly comprehensive series of experiments conducted by a committee of leading scientific men and practical engineers, which were appointed by the Austrian Society of Engineers and Architects. The Committee built arches of all kinds and sizes (from 7 to 77 feet). These were tested by loading them and determining the elastic deformation, which means that after the load was removed the arch sprang back to its original form. The arches were also loaded to destruction, and the load which produced cracks was carefully noted.

The

The following results on arches of 8 86 feet span are tabulated —

RESULTS of Testing Arches of 8 86 Span.

| Description of arch tested | Rise of intrados in inches | Thickness of arch in inches | Total dead load applied on half span in pounds | Load applied on half span in lb per square foot |
|----------------------------|----------------------------|-----------------------------|--|---|
| Concrete                   | 9 1                        | 3 5                         | 4,430  | 1,128   |
| Monier (1)                 | 10 2                       | 2 0                         | 3,810  | 1,218   |
| Monier (2)                 | 10 2                       | 2 2                         | 5,410  | 1,320   |
| Brick (1)                  | 9 8                        | 5 5                         | 4,170  | 835   |
| Brick (2)                  | 5 3                        | 3 9                         | 3,010  | 492   |
| Corrugated plate (1)       | 9 8                        |                             | 2,970  | 974   |
| Corrugated plate (2)       | 10 2                       |                             | 2,130  | 1,100   |

The method of testing consisted in levelling the top of the arch, which was built between rolled beams as in ordinary floor construction, with plates and channel bars at ends, and tie rods in the middle. A board-floor was laid upon the top of the arch and loaded with pig iron. The arches were made in each case four months before testing. The loads were gradually applied, and at each increment of 200 pounds the horizontal and vertical displacement at the crown of the arch was carefully measured. It was observed that the concrete arch deflected less than one half the brick arch.

Another series of experiments was made on spans of 13 3 feet, with the following results —

RESULTS of Testing Arches 13 3 feet span.

| Description of arch tested | Rise of intrados in inches | Thickness of arch at crown, in inches | Weight of steel used in pounds per square foot | Breaking load in lb per square foot |
|----------------------------|----------------------------|---------------------------------------|--|-------------------------------------|
| Brick in cement mortar     | 15 $\frac{3}{4}$           | 6                                     | .. ..  | 321 5                               |
| Concrete                   | 15 $\frac{3}{4}$           | 4                                     | .. ..  | 737 3                               |
| Monier                     | 15 $\frac{3}{4}$           | 2 $\frac{3}{4}$                       | 4  | 839 7                               |
| Melan                      | 11                         | 4                                     | 1 4  | 3,360 0                             |

The Monier arch had one wire net 2  $\frac{3}{4}$  in by 2  $\frac{3}{4}$  in meshes made out of  $\frac{3}{16}$  in round wire. The load was applied on half the span. The cracks observed occurred in the concrete arch with twice the load which was necessary for the brick arch, and in the Monier arch it required two and a half times the load necessary for the brick arch.

The Melan arch was made with I beams 3  $\frac{3}{4}$  inches deep, and was one year old when tested.

Five other arches, each 75 4 feet span, 15 1 feet clear rise, and 6 56 feet width, were especially constructed for the purpose of experimenting, and were tested to destruction. One load was applied at six points over half of the arch, and the thickness of each arch, and the rupturing load, are as follows. —

TESTS of 75 6 feet span.

| Description of arch tested | Thickness of arch at crown in inches | Thickness of arch at springings in inches | Ultimate breaking load in lb per square foot |
|----------------------------|--------------------------------------|---|--|
| Rough stone                | 23 6                                 | 43 3                                      | 660  |
| Brick                      | 23 6                                 | 43 3                                      | 602  |
| Concrete                   | 27 6                                 | 27 6                                      | 742  |
| Monier                     | 13 8                                 | 23 6                                      | 1,300  |
| Steel                      | 12 6                                 | 12 6                                      | 1,564  |

The stone arch was of rough quarry stone, laid in mortar made of 1 part Portland cement and 2 6 parts of sand. Both the stone and the brick arch were tested fifty one days after their completion, and the manner of failure was similar in each, radial cracks appearing on the extrados near the skewback on the loaded side, and over the haunches on the unloaded side. The steel arch was formed of ribs spaced 5 9 feet centre to centre, each rib having a solid web, with flanges of angles and plates, while the ends abutted against pins at the skewbacks. Failure occurred by the lateral bulging of the unloaded half of the arch.

It will be observed that the Monier arch carried 1 75 as much as the concrete arch, although it was only half the thickness at the crown. Comparing the carrying capacity of these large arches with that of the smaller ones it will be seen that the economy of the Monier principle is proportionately greater. This result might have been anticipated, as failure occurred by lateral deformation in consequence of the bending moment produced by the partial loading, which called into play the tensile strength of the concrete to a greater extent than in the smaller arches.

The following considerations should be noted in connection with the strength and durability of the Monier system. In regard to the association of iron and cement mortar in arches or beams on the Monier system, it might be urged that two such materials could not be expected to work together, and that the cement would probably crack before the tensile stress was distributed over the iron net work. This is answered by the experience of the late Professor Bauschinger, of Munich, who found that the cement mortar adhered to the iron with a force of 336 lb per square inch. The adhesion of cement mortar to bricks and stone is very much less, and the average of a large number of experiments made by the writer gave for bricks with cement mortar in the proportion of 3 to 1—using Nepean River sand 24 lb per square inch, and with crushed sandstone 48 lb per square inch. These results were obtained by testing specimens twenty eight days old. Although these results are less than those obtained by Prof Bauschinger for cement mortar and iron I see no reason to doubt their accuracy, indeed no one who knew the work of the late Prof. Bauschinger could possibly doubt the accuracy of any result he published. Cement mortar is an elastic material, although its limit and modulus are most difficult to determine, but Prof Back, of Vienna, gives the modulus as 750,000 lb per square inch, which is much lower than those given by other experimenters. Taking into consideration the elasticity of the cement and sand compo, with the adhesive strength of the compo to the iron net work, it follows that these two materials should work well together in the Monier arch, provided that the areas of the two materials are so proportioned that the resistance to compression of the compo without the iron is equal to the resistance to tension of the compo with the iron net work. This will be true, provided the relative stresses in the iron and the mortar are always within the adhesive strength, which appears to have been the case in the experiments on arches and beams, the results of which have been tabulated. As to the durability of the iron surrounded with cement mortar, all experience goes to show that iron is perfectly preserved from rust, and will show a clean surface after it has been buried for years in cement mortar. Iron is said to form a silicate with the mortar, which acts as a protective coating, resisting all further oxidation. This was one of the reasons which induced the writer to recommend that the steel cables in the North Sydney suspension bridge should be surrounded with 3 to 1 cement mortar, and the tunnels leading to the anchorages should be filled up with concrete. As to the effect of variation in temperature in producing relative stresses in the mortar and iron net work, the coefficient of expansion of iron is 0000145, and of cement mortar 0000137 to 0000148 so that the small relative stresses, due to the small alterations in length of the two materials, would be completely equalised by the elasticity and adhesive strength of the mortar.



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As to the method of putting in the compo. or mortar in the Monier arch and incorporating it with the netting of iron, the cement and sand used should be of the very best description, and the compo., formed by mixing 1 part of cement to 3 of coarse Nepean sand, or crushed sandstone, should be thoroughly packed and rammed round the iron network, the work being pushed on so as to avoid the possibility of anything approaching a dry joint in the arch, the object being to form a homogeneous mass of mortar or compo. surrounding the iron. The quantity of water necessary to be used in the compo., and the precautions necessary in work of this character, are similar to those used in the preparation of specimens of mortar and concrete for testing, and for making first-class concrete.

The price of such work, although not great when considered as a lump sum, is relatively large when considered at per cubic yard, in consequence of the smaller thickness of the Monier arch, and the extra cost of the materials and labour involved in building it in a satisfactory manner.

In the diagram appended to this report, two lines of pressure on resistance have been drawn for the Monier arch over Johnstone's and White's Creek. The lower line would apply to the arched ring without the iron rods, from which it will be seen that it cuts the intrados near the springing, which would indicate that the tension developed at the extrados at that section would be sufficient to cause fracture. The Upper Line shows the distribution of pressure for the Monier arch, and the tables give the results of the calculations from which this line has been determined. It will be observed that the line cuts, or nearly cuts, the extrados at a point 6·5 feet from the centre of the span, at a section marked DE on the arch, and which is shown to a larger scale in fig. 2, with the intensity and distribution of the pressure and tension over this section.

The maximum tension at the extreme edge is 466 pounds per square inch, and pressure 933 pounds per square inch. I have taken the carrier full of sewage and have probably over-estimated the loading, so that the values given are excessive, and apply only to the points E and D respectively.

In regard to wind pressure, I have calculated the maximum tension and compression due to a wind pressure of 30 pounds per square foot as allowed for in bridge work, and find that it only adds about 25 pounds per square inch to the above figures. The section considered, namely DE, is the least favourable, and hence it is not necessary to go further. I consider the arch to have the necessary strength and stability in consequence of the Monier system of network. It would, in my opinion, have been insufficient in thickness without it, at the same time with a network arranged near the extrados, in addition to the one near the intrados, the thickness might have been reduced still further. [*Vide Appendix J.*]

References for information on the Monier and similar systems.

The American Society of Civil Engineers.

*The Engineer*, April 10th, 1896, page 364.

*American Engineering News*, April 2nd, 1896, page 220; April 9th, 1896, page 238.

Proceedings of the Institution of Civil Engineers, London—

Vol. CXI, page 413; Vol. CXVII, page 407; Vol. CXX, page 392.

We may now consider those properties of iron and cement which make both materials especially fit to be used together.

- 1st.—The modulus of elasticity of concrete (after Professor Breck) is about  $\frac{1}{10}$  of that of mild steel. This great difference enables us to have in two neighbouring fibres a small stress in the concrete and a forty-times larger one in the steel.
- 2nd.—Professor Bauschinger found the cohesion between iron and concrete, after hardening, to be from 570 to 640 lbs. per square inch. This is more than the tensile strength of the best concrete. It acts like a glue if once hardened.
- 3rd.—Concrete is the best conservator of iron. The writer knows of a case where iron rods were found perfectly rust-free, having been imbedded in concrete below water-level for 400 years. There are many devices designed on this important property, and for the protection of iron concrete is better than paint.
- 4th.—The thermic expansion of both materials is the same, and change of temperature will not originate secondary stresses.

Bonnieau, a French author, gives the thermic expansion of Portland cement as 0·0000143 for 1° Celsius, while iron has 0·0000145, which is practically the same.

With regard to the Monier slabs which I tested I should like to point out that they were made at Arncliffe, and were sent up to the University in carts. The iron bars were projecting in such a way that they were liable to be knocked, and unless the men who brought them were given to understand that they were to be handled very carefully, the probability is that they would have been knocked about a great deal. That is the way in which I account for the comparatively low results which I obtained from them.

9253. The report you have read embodies the result of your researches and your own experience combined? Yes. I should also like to hand in a paper which appears in the journal of the American Society of Civil Engineers of April last. I have marked a few passages, and they may be taken to be embodied in my report. You will see that the paper deals with the question in a more concise manner, and I think that if one required to study the Monier system one could do so better by reading that paper than by obtaining more scattered information. I have also appended to my report a list of the literature on the subject so that it may be handy for reference.

9254. *Mr. Hickson.*] You visited the aqueduct work in progress at White's Creek and Johnstone's Creek? Yes.

9255. Have you made an estimate of the cost of the Monier arches? Yes. I have made a rough estimate of the cost of the compo. I could only do so of course from what I know of the quantity of stone and the quantity of sand which will go with the cement in the mortar. One cask of cement and 13½ cubic feet of sand will make 13½ cubic feet of compo., or half a cubic yard. In the case of compo. the cement fills in the interstitial spaces in the sand. One cubic yard of ordinary compo. requires two casks of cement. I have taken the cement at 10s. a barrel. I do not know what you would pay for it, but I generally pay a little more. I have estimated one cubic yard of crushed sandstone at 7s. 6d. That would make the cost of the material £1 7s. 6d. per cubic yard. The ironwork comes out at 7s. 6d. a cubic yard. The labour I have put down at £1 a cubic yard, timber at 10s. 6d., and supervision and plant at 8s., making a total of £3 13s. 6d. I do not know what would have to be added to that in the way of percentage or profit. That would make the amount a trifle more. I have taken out the arches alone. I have made a similar calculation in respect to the carrier, and I may mention that I never quite understood how the carrier was made until I inspected it. I see that blue metal topping is being used, and that would make the cost a little more. You would have one cask of cement, 6 cubic feet of sand, and 10 cubic feet of bluestone—producing 15 cubic feet in the work. That would make the cost of the cement 18s., the sand 3s., and the bluestone 8s. 4d. You will see that the material comes out at £1 9s. 4d. instead of £1 7s. 6d. for the compo. in the arches. I did not put in the labour in the carrier, because I did not think it necessary to work out the real cost to the contractors of that part of the work, but an estimate can readily be made upon the lines I have already given.

9256. I suppose you could in a few days furnish His Honor with an estimate of the cost of the whole of the contract as it is now being carried out? Yes. Of course I should have to take out quantities, unless the quantities which I understand have already been taken out were accepted.

9257. Am I correct in saying that the Monier system, judged by your tables, will make the structure twice as strong as if carried out upon an ordinary design? Yes. It would be practically more than that.

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I should not like to build arches of that thickness without the Monier system, even if you were to put the best of material into it. It looks a wonderfully light structure. The Monier system introduces a large element of strength. As the span of the arch increases, so does the strength imparted by the Monier system increase.

9258. You have based your estimate upon a full carrier? Yes, up to the brim, although I know that that would not happen.

9259. There are off-takes so that it would only flow two-thirds full? I know that it is usual for sewers to flow two-thirds full. I have allowed liberally for everything, and as I say I have not allowed for any assistance from the carrier. I think, from what I see from the plan now, that I may rather have overdone it. I may have been too severe upon the work. The small piers would scarcely discharge anything worth speaking of. If I had seen the drawings before I should have acted differently, because the carrier in itself would carry the weight of the sewage from the pier to where it joins the centre. Had I allowed for that it would make the arch come out much stronger. I may say this, however, that I do not think it would be safe to put in the work in that thickness without the iron net-work.

9260. Did you see the work being carried out? Yes; both at White's Creek and Johnstone's Creek.

9261. And you are satisfied that it is being efficiently and properly done? Yes, I was very pleased indeed with it.

9262. If you had been engineer-in-charge of the work, could you have suggested any other or better mode of carrying it out? No; what I saw there was first-rate in every respect. I was only there one afternoon, and I noticed that the concrete work was going on. I made a note of the material which was being used.

9263. Has your attention been called to a discussion which took place upon the Monier system in the American Society of Engineers? Yes; I have appended extracts from that pamphlet to my report. I may mention that I am a member of the Society, and that I receive their reports regularly. You will find the discussion at the end of the pamphlet I have handed in.

9264. Do you remember its being stated there that by the adoption of the system a saving of something like 60 per cent. would be accomplished;—was not that mentioned in the discussion? I think I saw that somewhere, but I did not pay much attention to it.

9265. When my attention was first drawn to this system I submitted a minute recommending its use wherever it could be used, and pointing out that there would be a probable saving of 50 per cent. in the cost of arches where it could be employed. In this particular work with which we are dealing, the cost of the arch under the Monier system is practically the same as the cost of a brick arch. That statement appears to be inconsistent with the statement contained in my minute. Can you explain why there should be a saving of 50 per cent. in the case of some bridges or arches and no saving in other cases? This is a special case. You have a big carrier, and there is only one net-work. Your thickness is greater than would be usual with an arch of that span.

9266. In ordinary circumstances there would be two nettings, one in the extrados and the other in the intrados? Yes; I cannot quite make a comparison between the cost of compo. and brick, because in the one case the work has never been attempted. I do not see what you could have done more than you have done. I, myself, should have done about the same thing with the material. There being a distributed load there is no necessity to put in a double system of netting. You might reduce the arch slightly by a double system of netting. Then there is the wind pressure to be considered. That is considerable in this case. It would not occur in ordinary bridges to the same extent; but that is not a very serious addition.

9267. In a wide road bridge you could reduce the thickness of your arch very considerably? Yes; you would have to put in double net-work, otherwise there would be cracking at the extrados of the haunches.

9268. While there might be a considerable saving, say 50 per cent., by the adoption of the system in the case of a wide road bridge there would not be a great saving in a narrow arch like this? I do not know what the difference in saving would be exactly; certainly it would not be the same.

9269. It has been suggested by some one that the carrier in this case would not be water-tight. If it were rendered with a 1 to 1 cement, would not that make it water-tight? It has always made work water-tight in every structure of the kind which I have seen. It is the only thing to make a work of the kind water-tight. I think I could point to large water reservoirs which are absolutely water-tight where this material has been used without puddling.

9270. And in those cases there would be a large head of water, whereas in this case there would be only 3 or 4 feet? Yes. I remember being responsible for some tar wells in which there would be 30 feet head of water, and we had a rendering of 1 to 1 cement on the inside,  $\frac{1}{2}$  inch thick. There was another thickness just underneath; but it shows that cement rendering is about as good as anything to make a tank or sewer water-tight.

9271. You regard the structure as perfectly substantial and durable? Yes; I feel thoroughly convinced about that. I should not myself care to reduce down to the thickness which you see mentioned in some cases where the Monier system has been used. It would be very different from anything we have been accustomed to, and in the first case of the kind one naturally likes to leave a little margin. I do not think any undue margin has been left in this case.

9272. Do you know the terms upon which the contract has been let? No. I only know from reading the newspapers that the system was substituted for the ordinary system—meaning, I suppose, ordinary brick arches.

9273. Supposing the contract is to be carried out under a guarantee for three years, would you consider that the country was running any risk? No; because, in much less time than that, if any cracks are going to develop they will be apparent. It is quite possible that, notwithstanding every care and attention, some cracks will develop. It would be almost impossible to avoid a certain number of hair-cracks.

9274. But anything which is likely to occur in that direction would occur before the expiry of three years? Yes, undoubtedly. I should say it would occur in twelve months, if it is going to occur at all; up to that time the work will increase in strength very rapidly.

9275. *His Honor.*] As to the value of crushed sandstone in relation to Nepean sand, can you give us any information? Yes; I can give you the results of many tests.

9276. *Mr. Hickson.*] Can you give us the value of crushed sandstone used for sand in concrete compared with the sand which would be generally used round about Sydney? Yes. I have made tests of the various

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various descriptions of sand. I can give you the tensile and compressive strength, and also the transverse strength. I have tested for thirty days, ninety days, six months, and twelve months. The Surrey Hills sand gave a tensile strength in pounds per square inch of 134·7; the Liverpool sand of 143·5; the Emu Plains sand of 201·14; and crushed sandstone, 152·74. Taking the ninety days' tests, the Surrey Hills sand gave a tensile strength of 172·1 lb.; the Liverpool, 165·8 lb.; the Emu Plains, 234·4 lb.; and crushed sandstone, 216·5 lb. Then taking the six months' tests, the Surrey Hills sand gave 201·54 lb.; the Liverpool, 204·7 lb.; the Emu Plains, 280·3 lb.; and crushed sandstone, 244·3 lb. Then taking the twelve months' tests, the Surrey Hills sand gave a tensile strength of 224·42 lb.; the Liverpool sand, 238·5 lb.; the Emu Plains sand, 272·0 lb.; and crushed sandstone, 286·5 lb. I will now give you the compressive strength in pounds per square inch. Taking first the thirty days' tests, the Surrey Hills sand gave a compressive strength of 1,932 lb.; the Liverpool sand, 1,240·7 lb.; the Emu Plains sand, 1,854·1 lb.; the crushed sandstone, 1,100·6 lb. Then taking the ninety days' tests, the Surrey Hills sand gave 1,617 lb.; the Liverpool sand, 1,569·4 lb.; the Emu Plains sand, 2,242 lb.; and crushed sandstone 1,671·5 lb. Taking the six months' tests, the Surrey Hills sand gave 2,068·7 lb.; the Liverpool sand, 1,887·1 lb.; the Emu Plains sand, 2,459·9 lb.; and crushed sandstone, 1,499·4 lb. Then take the twelve months' tests, the Surrey Hills sand gave 2,025·9 lb.; the Liverpool sand, 1,612·0 lb.; the Emu Plains sand, 2,674·2 lb.; and the crushed sandstone, 1,532·3 lb. I will now give you the coefficient of transverse strength in lb. per square inch. Under the thirty days' test the Surrey Hills sand gave 280·5 lb.; the Liverpool sand, 277·1 lb.; the Emu Plains sand, 376·9 lb.; the crushed sandstone 288·6 lb. Taking the ninety days' tests, the Surrey Hills sand gave 373·3 lb.; the Liverpool sand, 381·75 lb.; the Emu Plains sand 545·5 lb.; and the crushed sandstone, 421·9 lb. The Surrey Hills sand in the six months' tests gave 457·5 lb.; the Liverpool sand, 480·9 lb.; the Emu Plains sand, 510·9 lb.; and the crushed sandstone, 516·7 lb. Taking the twelve months' tests, Surrey Hills sand gave 546·2 lb.; the Liverpool sand, 440·6 lb.; the Emu Plains sand, 562·5 lb.; and the crushed sandstone, 578·4 lb. The transverse tests are very valuable, because they embrace both the compressive and tensile strengths. You will see that crushed sandstone is the highest of all in the coefficient of transverse strength. In the compressive strength tests it does not do so well as the Nepean sand, and in the tensile strength tests the Nepean sand is a little better than the crushed sandstone. I have crushed sandstone at the University, which I use as a standard, because it is uniform in quality. It is sifted through two sieves—a 900 and a 400 mesh.

9277. *His Honor.*] The sand is not washed, is it? No. I may mention that the Emu Plains Company, the Surrey Hills Company, and the Liverpool Company, supplied me with sand for tests, and I have put the results down for my own guidance; but for the purposes of my tests at the University I generally take some crushed sandstone out of my own box. I think I have some at the University now. I may mention that the Emu Plains sand is of two qualities. Some of it is coarse and some of it is fine. The coarse sand is much the better for the making of compo.

9278. *Mr. Hickson.*] I see from your tests that the twelve months' test, so far as the coefficient of transverse strength is concerned, gives the best results for crushed sandstone? Yes.

9279. *His Honor.*] Do I understand that the crushed sandstone is sifted for your tests? It is sifted, but not washed.

9280. Through what is it sifted? Through 400 and 900 mesh sieves, so that I get a uniform quality. It is necessary for testing purposes to have it uniform. The grains used are those which are found between the sieves.

9281. In the 900-mesh sieve do you find that you get much dust out of it? A little. I cannot give you the exact quantity. Of course we take the sand which is sifted, and the rest is thrown away.

9282. Mr. Young's idea, according to his evidence—and he said that that was his experience—was that the Sydney sandstone contained a good deal of clay mixed with the particles of silica? I have done a good deal of testing in the case of sand, and I should say that what you are speaking of would depend upon the sandstone used. The Sydney sandstone varies wonderfully. The Pymont sandstone and some of the Waverley sandstone is first-rate stuff. I have never found any appreciable quantity of clay in it.

9283. Mr. Young said that even the hard crystalline white sandstone contained a considerable portion of clay? I should not say there was a considerable quantity of clay; there may be a trace of it.

9284. Does the clay, in so far as it exists in the sandstone, affect the question of gradual shrinkage in compo. after it has been in position for some considerable time? I do not think so. Even if there were any considerable quantity of clay in the sand you would find it out very quickly in the tensional stress.

9285. You think it would reduce the tensional strength of the material? It would prevent the adhesion of the sand to the cement. Our experience is that we do not find much material difference between the standard sand and other sands. The Nepean sand is a little better if you get the best of it. It is not quite so good if you get the finer grains. Still there is not a very great difference. If there were clay in the sand to any appreciable extent it would show at once in the test. There can be no question about the absence of clay in the case of the Nepean sand, because it is washed. At all events, the small quantity which might be present in any case would not affect the shrinkage.

9286. Mr. Young's impression—and he said it was to a certain extent his experience—was that there would be a gradual slow shrinkage after the setting;—this shrinkage would go on for some considerable time? I do not think so. I do not quite know what he means by a gradual and slow shrinkage. If you used a micrometer you might find a slow shrinkage, but I think it would remain constant in volume.

9287. After setting? Yes, of course. The cement itself expands in setting. You can smash a glass tube with the expansion.

9288. Chemically, what is ordinary Portland cement? It is a complex double silicate. It is considered by one eminent chemist to be so and so, and by another to be something else. Of course it is a silicate.

9289. *Mr. Hickson.*] I suppose that if there were any clay in the sand it would show at once in the cracks in the work—in the honeycombing and in the shrinkage? Yes, if there were any quantity. If there were any appreciable quantity of clay in the sand I should have discovered it long ago in my tests. The assertion is quite new to me.

9290. When you were at White's Creek and Johnstone's Creek the other day did you see crushed sandstone being used in the Monier arches? I never examined the sand.

9291. Then you could not say whether you thought it good or not? I did not take much notice of the sand. I was more interested in the size of the bluestone metal which was being used. I had not a good opportunity to observe the sand. There was not much of it lying about at the time I was there.

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9292. You examined the arches, some of which have been erected for some time, and you noticed no shrinkage, did you? No. The work which I saw being carried out was on the carrier. The arches had been finished. Of course the contractors would naturally push on with them until they had finished them, and I noticed nothing wrong with the arches.

9293. *His Honor.*] It is, as a matter of fact, the water of crystallisation that affects the cement? Yes. The cement is made by mixing clay and chalk. It is then calcined at a high temperature, and is afterwards ground.

9294. Is all the water that is mixed with it supposed to become water of crystallisation finally, or is any of it supposed to pass off by evaporation? Some of it must pass off by evaporation. It depends upon whether you mix it upon a non-absorbent body, such as slate or glass. In the carrying out of work you cannot do that. You have always to put more water in concrete which would be made under those circumstances than you would put in test specimens.

9295. So that you would hardly get so good a material? I would not say that, because you want to get the minimum quantity of water in the work. You do not want what you lose. It is the minimum quantity that you wish to get.

9296. But speaking of the water contained in the body of the concrete or compo.,—do you say that it actually passes away by evaporation? If by ramming it tightly you just find the surface damp, you know that you have got the right quantity in. In the laboratory we measure accurately the quantity to be put in. We always have the same quantity in mixing, because we want to test under exactly the same conditions.

9297. The whole of the retained water ought to become, finally, water of crystallisation? Yes.

9298. It is not capable of evaporating later on? No.

9299. So that perfect setting is inconsistent with the idea of evaporation later on? Yes.

9300. And it ought to be inconsistent with the formation of even hair cracks? Yes; of course what takes place in the setting one scarcely knows, except that a silicate is formed somehow or other which gradually increases in strength with age.\*

9301. As to the amount of water of crystallisation, I suppose it is impossible to say what the number of equivalents would be;—I suppose they vary? I do not think that has been done. A number of eminent chemists have investigated the subject, but they have not dealt with it as they have with alum and other well-known chemicals. The water of crystallisation depends upon the chemical composition. I was talking about the matter to Professor Tetmejer, at Zurich, who has done more in connection with cement than anyone else. He is the highest authority on the question.

9302. Practically it comes to this: will a very high temperature or a dry season cause properly-set compo.—compo. set perhaps for twelve months or more—to shrink further? I think not.

9303. Even if it contained a little free uncrystallised alumina? I do not admit that it does contain any but a minute trace of alumina; but I do not think there is the slightest danger of well-made compo. giving any trouble whatever through ordinary changes in temperature. You can test that by examining similar works in which cement rendering has been used.

9304. The question further crops up as to permeability—that is as to the water-tightness of the rendering upon a body of concrete or compo.;—it is a very well-known fact that in buildings the rendering, which is generally called cement, upon the walls does not actually keep the rain out unless it is painted, showing that there are hair cracks, although you cannot see them, through which the water manages to get;—how do you explain that and make it consistent with the fact that the carrier in a case of this kind would be actually water-tight? All material is more or less porous. You can get air through a solid brick wall. Air can be made to pass through a brick itself under a not very high pressure. I have an apparatus which I use for testing the permeability of concrete, and I frequently have a 10 or 12 foot head on. With neat cement you can easily get that.

9305. Without any apparent leakage at all? Without any apparent leakage.

9306. An instance given of the alleged inability of cement to keep water in is that of the aqueduct near the Prospect reservoir;—have you seen that aqueduct;—it is an aqueduct over a sandstone gully? I saw it a long time ago.

9307. According to Mr. M<sup>c</sup>Credie, it is leaking still? There may be many cases in which cement would not be water-tight, but it is the best known means of making these structures water-tight. It is used all over England and America. It is the recognised system for making reservoirs water-tight.

9308. It is used sometimes without any backing or puddling? It is not necessary to put puddling in if you have a cement rendering.

9309. I mean in the case of a reservoir? I am speaking of a service reservoir, not a storage reservoir. In an ordinary reservoir it is a common practice to put in cement rendering without any puddling at the back. It is generally considered that that would make the reservoir water-tight.

9310. It is found to be sufficient, you say? Yes. They decide what they will do according to the material at hand and the cost. Sometimes cement is used, and sometimes the puddling is depended on.

9311. *Mr. Hickson.*] As a matter of fact, the putting in of puddling behind the concrete walls of reservoirs has been entirely given up? Yes, I believe it has.

9312. All the storage reservoirs in the neighbourhood of Sydney are rendered? Yes.

9313. And they are quite water-tight? Yes. A paper was read by Mr. Darley before the Royal Society giving a list of all the reservoirs which had been constructed and the mode of construction, so that the matter can be easily verified.

9314. *His Honor.*] No reservoirs recently built have been puddled? No.

9315. *Mr. Gummow.*] You say that you did not particularly notice the sand which was being used out at White's Creek and Johnstone's Creek? I did not examine it; that is, I did not feel it or do anything of that sort.

9316. You state in your report that you have taken the compressive strength of compo. at 1,600 lb. to the square inch at three months? Yes; that was concrete, not compo.

9317. What would you consider a fair compressive strength of compo.? 2,000 lb.

9318. And if the sand which is being used will stand 2,000 lb. to the square inch you would be satisfied with its use? I should say that it was good material. Looking down my list of tests, I see that there is only one case where 2,600 lb. is given, and that is in the twelve months' test. 9319.

\* NOTE (on revision):—The setting of cement, according to Pettenkofir, seems to make the process consist (1) of the formation of a silicate of lime and the hydration of the silicates of alumina and iron; (2) further, in the reaction of the silicate of lime on the other silicates, forming double hydrated silicates. According to Frey, there is (1) a formation of an aluminate of lime, and of hydrates which attain considerable hardness; (2) a reaction of the calcium hydrate on the basic calcium silicate. Experiment seems to show a progressive increase of combined water in hardening cement.

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9319. At what age would you put the 2,000 lb.? Ninety days. I have not anything in my list over 2,000 lb. except for ninety days. I get higher results, of course, in six months and twelve months. I should not expect 2,000 lb. in thirty days.
9320. I suppose the work out at White's Creek and Johnstone's Creek would not be used under ninety days? No. I think it would be longer than that in course of construction.
9321. As to the expansion of compo.;—can you give His Honor any particulars as to that? It is referred to in my report.
9322. Do you consider that compo. or concrete will expand under heat? Certainly, every substance will expand. Clay contracts, but, on the other hand, stone will expand under heat.
9323. You made some tests of the adhesion of brickwork, and you say that crushed sandstone gives you double the value of Nepean sand? Yes. That is the average of a large number of tests (say) 300.
9324. Then from the adhesive point of view you prefer crushed sandstone? Certainly.
9325. Have you seen what Mr. Bagge says as to the three alternative schemes concerning which he was asked to make a report? No.
9326. *Mr. Parkes.*] Do you not receive State pay? No; I am Challis Professor of Engineering. That is a special endowment.
9327. Are you not constantly making tests for the Public Works Department? Yes.
9328. And are you not paid for those tests? Yes.
9329. By whom are you paid? By the Government.
9330. What are you paid for making these tests? It depends upon what the tests are.
9331. Have you not a fee for testing? Yes. Supposing that three pieces of iron are sent up to be tested for tension and report—there would be a fee of £3 3s.
9332. How many tests have you made of the Monier arch system at different times? Not many—six, I think.
9333. Upon what date did you make the first test? On October 26th, 1894.
9334. Had you, at that time, any communication with Mr. Baltzer, who held the patent? No.
9335. Did he not come to see the tests made? No. I do not think the tests were made by Carter, Gummow, & Co. They were made in the ordinary way. Mr. Davis sent the slabs up, therefore he would know all about them.
9336. Were they made at Arncliffe? Yes.
9337. Near the sewerage works there? Yes. They were prepared there and sent to me to be tested. I did not make the slabs as I usually do. They were made by the sewerage branch, under Mr. Hickson, and were sent to me for testing.
9338. At the Government expense? I think I had better explain the circumstances. I was asked by the Government whether I would test about 60 blocks and what my fee would be. I was about to make a series of tests in concrete. We do not get paid for a thirtieth or a fortieth of the number of tests we make. We make them to get constants for calculation of strength. We do a lot of work of that class for ourselves and quite apart from the Government—just in the same way that we investigate other things at the University. I saw an opportunity in this offer of the Government for making a good series of tests, and I said, "If you will make all the blocks that are required, as the matter is one of scientific interest, I will make the tests for nothing." So that we were really not paid for them. The blocks were made at the sewerage works and were tested at the University.
9339. Under Mr. Davis' instructions? Yes.
9340. You have been to Europe lately? Yes.
9341. Did you see any Monier work in construction there? I saw some in America.
9342. Did you see none in Europe? No, but I discussed the system with various persons.
9343. You saw no Monier work being actually carried out there? No, not in Europe.
9344. What was the nature of the work you saw being carried out in America;—was it the Monier patent proper? Yes.
9345. Was it patented in America by the original Monier? I do not know. I looked upon it as a piece of construction in which iron and concrete were used, and I was only interested in it to that extent.
9346. Is it not possible that there may be a special silicate in the Monier system which is unknown to the public so far? I should hardly think so.
9347. Has not a special cement to be used in the work? Thoroughly good cement.
9348. But I mean specially gauged and tested cement? Yes. Thoroughly tested. For all good work you must use good cement. The material used in the Monier work, as in other work, must be thoroughly good. The very best of cement should be used.
9349. Do you think Mr. John Try's cement, made at Merrylands, is good enough for this kind of work? I have never tested it.
9350. Have you ever heard the figures resulting from the tests? I have heard of them, but I do not remember them.
9351. Have you heard whether it has or has not stood tests? Of course it will stand tests, but I do not know their nature. I have never seen a test-sheet of Mr. John Try's cement. I have not taken any special interest in it.
9352. Do you think it is the proper Monier patent which is being used in connection with the aqueducts at Johnstone's Creek and White's Creek? I should think so.
9353. Have you looked at the patent? No; but the work is similar to the work which I saw in America, and to the work which is described in the journal of the American Society of Civil Engineers.
9354. How do they connect the intersections of the net-work used in the arches in America;—in what way are they tied? I have seen some tied; but I do not remember at this moment the particular way in which they are tied.
9355. Have you seen it riveted or otherwise fixed at the intersections? It would not be the Monier system at all if it were riveted.
9356. Have you actually carried out any construction in this Colony? Yes; there is the North Shore suspension-bridge. Mr. Coyle was the engineer and I was the consulting engineer. I have also done some work in connection with the Parramatta water supply. I was responsible for some thousands of cubic yards of concrete in retaining-walls and arches in connection with large gas works at Manchester.
9357. Is it not a fact that iron and steel in association with cement and concrete have been used for years past in this Colony? Yes; in tie-rods for arches.

9358. But I mean iron in any form associated with cement or compo.? I could hardly say "associated with it." I should call it "associated" in the case of the Melan and the Wunsch system where you bury the iron in concrete to get strength out of it.

9359. But has it not been used here constantly? I do not know of it.

9360. Have you never heard of it being used? No.

9361. Mr. Young told us that he had used it in the form of a lattice for roofing—in the substructure of roofs for tiling? I know that galvanised iron has been used in arches with concrete, but that is not one of the systems we are dealing with.

9362. Has not iron been used in foundations in both lattice work and in long bars? You get something approaching the system in foundations. When you bury rolled girders in concrete you get something of the same kind.

9363. In diagonal bar work in foundations—in lattice or bar work set diagonally—is there not the same thing practically? I do not know precisely to what you refer.

9364. Do you know of another patent in existence for the same class of work? Yes. I have referred to several systems in which iron is buried in concrete.

9365. I mean a patent in this Colony? I do not know of it.

9366. Suppose the Government were to adopt the method in a form other than that in which it is tied at the intersections, could they not use it without paying any royalty? Well, that is a matter of law.

9367. As regards sand, you read your tests of some of the Emu Plains Gravel Co.'s sand? Yes.

9368. In the circular issued by the Emu Gravel and Road Metal Co. some tests are given, presumably with your authority;—the tests do not appear to be the same as those you have read out? In the circular the tests given are a summary taken out from the list.

9369. But they are what you supplied to the company, are they not? Yes.

9370. Do they not go to show that the Emu Plains sand is very much better than crushed sandstone? The results in my list show that the Emu Plains sand is better than crushed sandstone.

9371. Does the summary of tests, published by the company, include the whole of your tests? No; it does not include the tests made for twelve months. They have since been supplied with the tests for the twelve months, and if they are included it will be found that the figures, when averaged, correspond exactly with the figures in the book.

9372. Would it not be preferable, in all constructions of this kind, to use the pure gritty sand instead of crushed sandstone? If you could get Emu Plains sand, of a coarse description, you could not have anything better.

9373. Where did you get the crushed sandstone with which you made your tests? From Saunders' quarry at Pymont.

9374. Was it not the best bottom block stone? I could not say; I had to take the chippings he would let me have. A man was sent down with a cart and he brought the chippings away.

9375. Would the chippings be from the Hellhole or Purgatory quarry? Yes, I suppose so.

9376. That is the hardest Sydney sandstone there is? Yes.

9377. Have you obtained it lately? Yes.

9378. The quarries I have named are the only quarries that are working there now, are they not? If they are the only quarries working there now, of course the chippings would come from them.

9379. Suppose the sand used at White's Creek and Johnstone's Creek were made from the upper surface stone coming out of the cuttings and tunneling, what would you say in regard to the quality of the sand? I should like to see it. Sometimes, of course, it would not be so good as sand from the lower stone.

9380. As a matter of fact, is the upper surface sandstone of any use for sand? Not for sandstone, but whether it were of use for sand or not would depend upon what it turned out to be after it had been tested.

9381. Did you test the sand from any inferior stone? I did not test any from the upper layers of Pymont stone, but I tested a lot of ordinary sand.

9382. Had it been cleaned of organic matter? I mean taking the sand as we got it. I put in some cheap concrete the other day at the University: we were pressed for money, and we had to take the ordinary sand from Surry Hills, and the results were very similar to those which I have given you.

9383. It would be washed by rain to a certain extent, would it not? It would not be specially washed; we took it as we got it.

9384. Would you consider the sand used at White's Creek and Johnstone's Creek good sand if it were made up of stone coming from the upper surface, and if it had not been washed? I did not examine it.

9385. Supposing it had been made from sandstone such as I mentioned, and had not been washed, would it be good material? If it contained a lot of fine stuff of course it would not be as good as the crushed sandstone from which my tests were made.

9386. The sand to which you refer was sieved to get rid of all the fine stuff? To get a uniform material on which we could rely.

9387. What would be the result to compo. or concrete made out of fine unsifted sand? It would not be as good as compo. made out of a coarser material.

9388. You mean in tensional and compressive strains? I think it would show all round.

9389. When you were out at the works at Johnstone's Creek and White's Creek, did you notice the iron which was being put in? I examined the grid.

9390. What was being done with it? It was being put into the side of the carrier.

9391. Was there any rust on it? I should not consider it rusty; it was black iron.

9392. Was it yellow? No.

9393. Had it its native blackness? Yes.

9394. There was no rust on it at all? Not on the grid I saw.

9395. Speaking of the use of cement in reservoirs, can you tell us of any reservoir in this Colony made of cement compo., or concrete, holding water? All the reservoirs have been constructed under Mr. Darley, and he would be able to tell you if any were not water-tight.

9396. Are they holding water? I believe they are.

9397. Have you been to Potts' Hill lately? That is an excavation. It is not lined.

9398. Have you been along any of the channels, which are made of concrete, on the aqueduct running from Prospect? They are not made of concrete. They are made of stone. I believe many of them have been puddled at the back.

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9399. Some of them are of cement, are they not? I cannot recollect at this moment. I have been along the whole of the work, and the general construction consists of large stone blocks without anything at all between them.

9400. Even the oldest and the best of cement, with the best provision, even if put in  $1\frac{1}{2}$  inch thick, would show a uniform dampness after heavy rain, although there might be no apparent hair-cracks? Yes; I have noticed that at times.

9401. Will you look at the Monier plan and tell me the space between the invert of the carrier and the top of the arch? It would be 6 inches and the rendering.

9402. Suppose the cement became soaked with foul matter from the sewage, would it not be a menace to the structure in hot weather—when the work was exposed to the heat of the sun, and when the cement would be saturated with matter from the sewage? There are over 6 inches of concrete, and then you have the cement rendering.

9403. But it has been proved that cement rendering will not hold water, even in the best class of buildings? There may be a dampness on the inside of the arch, but I do not think anything would get through.

9404. There would be a soakage into the material, would there not? You would require water to produce the dampness. The sewage matter would not get through. It would be kept out.

9405. Is not cement rendering considered a dangerous material to use upon the inside of hospital walls? No.

9406. Is it not one of the materials which have been rejected by the Board of Health? I do not know why it should be.

9407. Have you noticed from medical reports that cement rendering is a dangerous material to use upon the inside of hospital walls on account of its porosity? No.

9408. When you went to the works at White's Creek and Johnstone's Creek you did not see any arches in course of construction? No; I simply noticed the centerings under them.

9409. In your report you said that this work must be carried on continuously? It is my opinion, from the nature of the work, that it should be done in that way.

9410. Supposing the work at Johnstone's Creek and White's Creek had been constructed arch by arch, leaving joints? The necessity for continuity applies only to a single span. You do not want continuity through the whole work. That applies only to the arch ribs themselves.

9411. What about the dry joints? You must not have dry joints. You must finish your arch right off.

9412. But you must have dry joints if you take the work arch by arch? I do not mean to convey that there is any danger in abutting against the dry work. What I mean is, that you should not stop your arch half way and then go on with the work a day or two afterwards, or even the next day.

9413. In these concrete structures where an arch is used—is it not necessary that the material should be put over the arch, and be rammed through the grid work? You would put down a layer of material. Then you would put the grid on that, and having put on some more material, it would be rammed through and all round the grid.

9414. In your valuation of this work you put down £1 per yard for labour—do you think the labour necessary to put the material in and ram it in would cost £1 a yard even if you included mixing;—is not that estimate excessive? I do not think so. The work has to be done very carefully. You cannot shovel it in like ordinary concrete.

9415. But shovelling it in would cost only a few shillings a yard. Is not £1 a very excessive price? No; I do not think so. Good concrete costs £2 10s. a yard.

9416. But what is the cost of the labour for putting in concrete? My estimate applies only to the arch itself, not to the piers.

9417. What would be the cost of the labour for putting in special concrete per yard? About 5s.

9418. Would not £1 be a very excessive price? I do not think so. It is quite a different thing.

9419. Suppose it had been proved under tests that 7s. is ample to allow for labor, what would you say to that? If you can prove it there is an end of it.

9420. How many men would it take to put a yard in? I should say it would take three men at least.

9421. How many yards would they do in a day;—would they do only one? They would have to put in the whole of the arch in a day.

9422. How many yards would there be in the whole of an arch? I have not taken out the quantities.

9423. There would be considerably more than one? Yes.

9424. When you come to think over the matter, do you not think that you put down an excessive price for labour? I put down a good price, because I saw that the work required great care. I put it down because I saw that you could not trust anyone to ram in the compo. round the net-work. You would have to put on skilled men, and you would have to pay a higher price for the labour. An ordinary labourer for putting in concrete would cost about 8s. a day.

9425. This Monier arch system is a new thing in the Colony;—have we any skilled men here? I take it that you would only put on good men to make these arches.

9426. Supposing the contractors could put on only ordinary men used to compo. and concrete, since we have no specialists here? The men may not be specialists, but you can train them to the work. The work must be done by men who have been trained to it.

9427. But what opportunity has there been of training the men to the work up to the present time? Several of the arches have been built, and if you have one or two trained men they could train others.

9428. You are referring to training which may have been done upon this particular work? Yes.

9429. Supposing the Monier arch is 82 ft. from centre to centre and that the span in the Departmental plan for the brick, stone, and concrete, arch is 52 ft.—supposing also that the 52-foot arch is 18 in. thick, and that the 82-foot span is only 14 in. thick, what would you deduce from that? In my tables I always have the same span.

9430. What was the thickness of the arches you used in your tests? I have not tested any arches. I have tested only slabs. I have tested ordinary compo. slabs with netting and without netting.

9431. You did not test a Monier arch to breaking point to see what it would stand? No, but I read of the tests made by the Austrian society. They made tests with concrete, brick, and Monier, arches.

9432. The tests you made were made with only flat slabs? Yes; I have not tested a Monier arch. I gave you my own tests and the tests of the Austrian Society of Engineers.

9433. Your own tests would be with flat slabs only? Yes.

9434.



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9434. As to the use of crushed sandstone, can you tell us of any cement-work of durability made with sand from crushed sandstone? Yes.
9435. Where is it? There is the Cockatoo Dock.
9436. How long has that been built? I do not know exactly, but I know that Mr. McKenzie, in building, would not permit any other sand to be used; and in that case the work would require to be first rate.
9437. Of great thickness? Yes; he had to make a water-tight dam.
9438. It would be work in a great mass, would it not? Compared with this structure, of course it would. It was a water-tight job.
9439. Did you ever wash any sand made out of crushed sandstone? There was no necessity to do so.
9440. You never washed it to see if there was any organic matter or clay in it? No; but I washed the sandstone itself. One of the tests I have is to soak the cube in water for twenty-four hours, and then test it. If there were any clay in it I should then get a bad result.
9441. You are not, then, in a position to say absolutely that there is no clay in the sand? I do not believe there is. That is proved indirectly by the tests I have made.
9442. You cannot state absolutely that there is no clay in it? No, certainly not.
9443. As to the elasticity of cement-work, when the cement is over twelve months old, is there any elasticity in it? Certainly.
9444. How is it that cracks occur so constantly in cement-work, supposing you have no iron grid in it; can you tell us of one instance in this Colony where cement-work has been reliable for any distance;—can you tell us of any space of 10 to 13 feet of concrete or cement work which has stood without cracking? Yes; the southern section of the sewerage works is a case in point.
9445. To what work are you referring now? To the outfall sewer at Botany.
9446. Is it standing well? There are hair-cracks, but you have to look for them closely. It is perfectly elastic. The work is thoroughly good.
9447. Do you know that after rain the water percolates clean through this sewer at the sewage farm outfall—have you been there? Yes.
9448. Have you been there after rainy weather? I have been there, but I did not notice the percolation you describe.
9449. Did you not notice what a shower-bath you got under the arch from the weeping of the cement underneath? I never noticed that.
9450. You said, in reply to Mr. Gummow, that the work was being carried out while you were at Johnstone's Creek and White's Creek;—when did you see that work first? I saw it this week.
9451. That is the only time you have seen it? Yes.
9452. It is pretty well completed, is it not? Unfortunately for me, the arches are pretty well complete; so that I was unable to see them in progress.
9453. Then you could not tell whether the work was being well done or not? I could not tell whether the arches were being well done or not; but they have been standing for some time I presume, and if the work had not been well done there would have been some signs of cracking. I looked along the work and tried to find some defects in it, but I failed to do so.
9454. *His Honor.*] Are the arches at both White's Creek and Johnstone's Creek finished? There are some to go in yet, I think.
9455. *Mr. Parkes.*] If you look at the section of the carrier upon the Monier plan, you will see that it is only  $4\frac{1}{2}$  inches over all at the side? Yes.
9456. Look also at the section of the carrier in the departmental plan;—if they were practically the same price, which would be the best to build? I do not know that there would be very much in the comparison. It must be borne in mind that you have a rendering of cement on the inside of the carrier, and that you have also the network in the carrier.
9457. But which is the more solid construction? The other has more material in it, but I think the Monier construction would answer the purpose.
9458. But the departmental plan is the better of the two, is it not? I would not say that. It contains more concrete.
9459. But is it not the more substantial? It is, if you measure it in the mass; but I do not say that with regard to strength. There is a good deal more strength in the Monier construction than you would infer from its dimensions.
9460. But would not the solidity of the departmental plan make it preferable? You are assuming, because it has more stuff in it, that it is necessarily the better or more substantial plan of construction.
9461. Supposing the departmental plan provided for special bluestone concrete with double-pressed bricks; leaving the Monier grid out, and having regard to the question of leakage and soakage and so forth, which would be the better structure? The carrier in the departmental plan is of course the larger, but I do not know that it is so preferable. If you are dealing merely with the question of water-tightness you have the same cement rendering in each case; and, so far as the water-tightness is concerned, you depend entirely upon that.
9462. But would not the greater thickness of material come in? Not beyond a certain thickness. You want a certain thickness, of course, to support the cement rendering, but beyond that I do not think there would be any difference in permeability. Of course, water would get through concrete fast enough—we know that—but then you have the rendering in each case.
9463. But take the whole side of the carrier—18 inches in one case as against  $4\frac{1}{2}$  inches in the other? If you were depending upon the thickness of concrete without cement rendering, of course the 18-inch carrier would be better than the  $4\frac{1}{2}$ -inch carrier; but with cement rendering in each case, I do not think you could show from tests that more water would get through one than through the other.
9464. But is not the thickness, in the case of the departmental plan, an additional safeguard against soakage;—with the cement rendering added is it not preferable? I could not say definitely that it would be. You depend upon the cement rendering, with, of course, a sufficient backing of concrete behind it. If you had a double thickness of concrete in the one case you do not make the carrier any the more water-tight. Whatever will get through the cement rendering in the one case will get through in the other. The greater thickness of concrete in the one case will certainly not make the carrier any more watertight.
9465. With only  $4\frac{1}{2}$  inches at the side in the case of one carrier, would you not consider it a source of danger in hot weather? In what way?

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9466. Well, having regard to shrinkage, and allowing for cracking caused by heat outside with comparative coolness inside? The sewage would be rather above the temperature of ordinary water. Even if you had the side thicker, it would be just as likely to crack under the conditions to which you refer.

9467. But is not that a source of danger in a construction of this sort;—would not a brick lining be preferable when you come to consider the changes of temperature? I do not think so. A brick lining would be safe, but on the other hand I could not say that this structure would be faulty because it had only  $4\frac{1}{2}$  inches of thickness at the side of the carrier.

9468. The whole of the constructions to which you refer in your report are latter day constructions? Some of them would be. I forget the exact date of the Austrian cases, but I suppose the structures would average from five to ten years old.

9469. The Monier patent was invented only in 1888 was it not? I think the date is given in the American Society's journal. The Monier system of course has been lately more used than either of the other systems to which I have referred. Upon page 439 of the journal of the American Society of Civil Engineers, you will find these words in reference to Monier—"The man to whom the invention is generally attributed is Jean Monier. He lived, at the beginning of his peculiar career (1876), near Paris, and was in the gardening business. His intention was to build large and strong tree pots, as they are much used there. Monier used for this purpose concrete with embedded wire nets, and invented the so-called Monier system. . . . We first hear of him when he received a first-class diploma of honor at the Exposition in Paris, in 1878, and in a comparatively short time he built nearly a thousand water and gas tanks throughout France, some of them 70 ft. in diameter and 11 ft. high. The next application of this system was to tubes and sewers, then came vaults and bridges, and finally flat floors.

9470. None of these systems have had a great deal of tests applied to them having regard to the life of the structures in which they are used, which is supposed to be from 100 to 200 years? That is so.

9471. None of them have had a greater test than ten years at the outside? That is a fair way of putting it so far as the special combination of iron and concrete in arches, known as the Monier system, is concerned.

9472. It would not have had more than a five years' test? No.

9473. To a certain extent it has been a risky construction;—there have been failures, and those failures have been reported? Yes; there was one failure with the Monier arch.

9474. But they have all been reported, have they not? I presume so. In the case to which I refer, it was perfectly clear why the failure took place.

9475. I mean in the case of bridges? I am referring now to an arch. I never knew of a bridge constructed on the Monier system failing, although a great many have been built.

9476. Is it not rather too early for anyone to have gained proper experience? I would not say that. If a system of construction be sound, we must make a start to use it at some time. It is of no use waiting for 20 or 30 years before you prove a certain thing to be right. If we did that, we should never get on at all.

9477. When did you receive the pamphlet from which you have been quoting? It is dated April, 1894.

9478. Did you know of the Monier system before that date? No; I did not know much about it before then.

9479. Had you ever heard of it before then? I have heard of it as one hears of many things, but I had never investigated it before.

9480. *Mr. Hickson.*] As to the porosity of rendering, Mr. Parkes mentioned the Potts' Hill reservoir—that is the case of an excavation with poor concrete on the face? I know the size of it, and knowing that, I am certain that no one would think of going to the expense of lining it with water-tight concrete. I should not expect it to be water-tight.

9480½. It is an earth reservoir with a puddle wall and concrete facing? The concrete, I suppose, would be like the concrete in ordinary reservoirs.

9481. Do you know if it is made out of cement or lime? I do not know.

9482. Have you examined the pipe-head basin at Potts' Hill? No; I never saw that.

9483. Then you do not know whether it is watertight or not? No.

9484. Do you know the Botany sewer, where it leaves the Botany Road, going down towards Botany? Yes; I have been over it a great many times.

9485. Do you remember the point where it crosses the water-channel? Yes.

9486. Do you remember what the construction of that sewer was? Yes; it is two rings of brickwork, and there is a single brickwork lining, backed with concrete and rendered inside and outside.

9487. Is there any leakage from that into the creek? I never noticed it.

9488. Do you know the Bondi sewer, where it crosses the head of Double Bay Valley? Yes.

9489. Have you noticed any leakage there? I have examined it very carefully. I have been over it again and again, and I have never seen any leakage.

9490. Do you know whether it is not a fact that sewage makes a scum upon all rendering work, and if there be any tendency to porosity, does away with it to a great extent? I never heard of it destroying the coating of cement in such a way as to render it permeable.

9491. With regard to the Monier patent, you were asked if similar constructions had been used in the Colony; let me refer you to the evidence of Mr. John Young at Question 6072;—is the work which he describes there anything like the Monier system? No; it is more like the use of hoop-iron in brick walls.

9492. So that it would be absurd to attempt a comparison between that work and the Monier system? Yes; hoop-iron could not be taken to be equivalent to the special wire-netting used in the Monier system.

9493. You know that iron rails are constantly put into concrete? Yes.

9494. But that is quite a different principle from what is known as the Monier principle? Yes it is. It is, however, from experiments of that kind that we have come to know that concrete preserves the iron.

9495. *His Honor.*] The Monier system distinctly recognises the proper position for putting in and distributing the tensile strength? Yes; it puts the grid where the tensile stress would be developed.

9496. It is of practically no use as a compression member;—it would be thrown away as far as that is concerned? Yes.

9497. *Mr. Parkes.*] Would it not be infinitely better to carry upon these aqueducts pipes of iron instead of this cement structure? It would probably, if you buried the iron in concrete; but the iron exposed would not be as permanent a structure as the Monier system. I should say that the Monier system would last longer. Of course, if you line the pipe with concrete or cement, you protect it.

9498. *Mr. Hickson.*] But the cost of that description of work puts it out of the question at once? Presumably.

9499. Regarding the question of cement which is used here, I think Mr. Bagge said that in all these Monier structures which were built on the continent special cement, under State supervision, was used;—do you think we could get as good cement here as could be got in England or on the continent? You would get the same. I have used the Germania cement largely in my tests, and that is a German cement.

9500. And our tests here are as severe as are the tests in any part of the world? They are practically identical.

9501. In many cases they are more severe, because you use the hot bath as well as the cold water? Yes.

9502. That is not commonly done in England? No. It has been introduced in America, and has been used lately in Germany.

9503. So that the tests to which cement is subjected here are as severe as they are in any part of the world? Yes.

9504. And the cement used in our structures is as good as can be got in any part of the world? Yes.

9505. *His Honor.*] Can you speak as to the evenness of quality of the cement turned out by established manufacturers in England;—Mr. Bagge said that the imported cement from England was not even, and he argued from that that the testing could not be satisfactory? You test from a shipment, and, of course, your results apply to that shipment. You may get a brand of cement, just as you get brands of other things, which may vary slightly, but the variation would not be very great. In some cases brands have been condemned which at other times have been passed. One shipment may be worse than another. I suppose it would be due to more carelessness in manufacture. The manufacturers find that they can sell the article they make in the first instance, and they subsequently take less care, the consequence being that the cement is condemned.

9506. I suppose the statement that the cement passed in Germany is the only cement which can be relied upon is scarcely reliable? That is nonsense. I am thoroughly acquainted with the nature of the tests applied in Germany. I spent a good many days consulting with the principal men connected with these tests—Professor Tetmejer, at Zurich; Martens, at Berlin. I took special care to look into the cement testing, to see if I could pick up anything, but I found no difference between their cement tests and ours. The tests are exactly the same.

9507. You think that cement which is tested out of Germany, then, can be fairly relied upon? Yes.

9508. *Mr. Gummow.*] You mentioned the Cockatoo Dock;—can you tell me of any other large dock upon which sand from crushed sandstone has been used? No. I just happened to remember the Cockatoo Graving Dock. I think that is a very good example on account of the difficulty of getting good work in a case of that kind.

9509. Do you know whether it was used in the case of the Sydney Town Hall or not? I am not absolutely certain.

9510. Could you get as good sand from soft as from hard sandstone, if the stone were crushed down to its natural particles? You might do so. The durability of sandstone depends not so much upon the composition of the grains composing the sandstone as upon the cementing material which unites the grains.

9511. The particles may be as strong in soft sandstone as in hard sandstone? Quite so.

9512. With regard to cement rendering, do you not consider that the trowelling put into it has a great deal to do with its strength and impermeability? The same thing applies to concrete generally. You may get bad or good results as you neglect or observe simple precautions.

9513. If the material used in the  $4\frac{1}{2}$ -in. thickness of carrier is superior to the material used in the thickness of carrier in the original design, would it not make it more impermeable? Impermeability depends entirely upon the cement rendering. If the rendering were better in one case than the other I should prefer that construction. If, for instance, it were better in the Monier design than in the other, I should prefer the Monier design.

9514. Suppose there was not cement rendering, but the material used in the  $4\frac{1}{4}$  inches of thickness were superior to, material used in the 18 inches of thickness? It depends upon how much better the material is. It is impossible to give a direct answer to the question because it is rather difficult to determine how much better the material is in one case than in the other. If the material were alike in both instances of course you would have a better chance with the greater thickness.

9515. Did you understand from Mr. Parkes' question that the sand used in the arches at White's Creek and Johnstone's Creek came out of the tunneling and open-cutting there? I do not understand that. I understood that Mr. Parkes wished me to give evidence as to certain kinds of crushed sandstone.

9516. *His Honor.*] I suppose you have never made a special examination of the structure of the Sydney sandstone in relation to colour and hardness—I mean by breaking up the different kinds of stone and treating them chemically? I have tested them with regard to the quantity of water they will absorb and the effect of acids upon them.

9517. Can you express an opinion as to the components of the different sandstones distinguished by colour and by hardness. Take, for instance, the hard white crystalline sandstone, and then the red, and brown, the softer sandstones? The harder qualities are better for crushing strength.

9518. There is more pure silica? Yes; but the question you have asked me goes beyond what I have done. You would require to have a chemical analysis made of each sandstone, and a subsequent examination under a microscope, before your question could be satisfactorily answered.

9519. Where the sandstone gradually changes its colour as it approaches the surface, and becomes softer, it is due to a change in the chemical condition of the iron which it contains? Yes.

9520. From the silicate or carbonate, I suppose, to red oxide? Yes; that, of course, would account for the difference in colour.

9521. The silicates decompose when exposed to the air? Yes; you will find the same process in the felspar of granite.

9522. As to the contained alumina or the hardness of the crystals into which the stone can be ultimately broken, you cannot say very much? No. It may be that stone, which would be bad stone to use for building purposes, might produce very good sand for testing purposes or for the making of compo.

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Joseph Davis recalled and further examined :—

J. Davis.  
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9522½. *Mr. Parkes.*] Will you refer to the papers in reference to Contract No. 79 which appear upon page 305 of the Parliamentary papers ;—I want you to read your minute, which appears on that page? Yes, it is as follows :—

Sydney, 19 May, 1892.

THE tunnels from some of the shafts on this contract will be commenced in a few days, and it is, therefore, necessary that it should be settled how they are to be driven, whether with 4-inch charges of compressed powder, 2-inch charges, or without blasting.

With a view of arriving at the method which would give the least annoyance to the residents in the vicinity of the sewer, consistent with economy, I have made comparative estimates.

The excavation by "guttering and gadding" will cost 3s. per cubic yard more than with 4-inch charges of compressed powder, but, as it is impossible to drive the tunnel by blasting to the exact size desired, considerably more concrete has to be used in lining when the driving is done by blasting than when done by "guttering and gadding"; and, taking this into consideration, I estimate it will cost about £1,250 less to do the tunnels without blasting compared with doing it with 4 inches of powder.

The 2-inch charges, with the extra supervision that would be required, would be the most costly of any.

I wish, however, to point out that while it would save annoyance and money to drive the tunnels without explosives, it would take longer to do the work.

9523. Does that mean that there would be an extra of £1,250? In what connection?

9524. I mean an extra upon the contract by reason of the substitution ;—would there be £1,250 more or less cost? What I say in my minute is, that if we adopt guttering and gadding, taking all things into consideration, the work will cost less in the tunnel by £1,250.

9525. *His Honor.*] In other words, that the guttering and gadding would save £1,250? Yes.

9526. *Mr. Parkes.*] The guttering and gadding being 63s. and the blasting 60s., there would be £1,250 extra ;—is that it? There would be £1,250 saved if the tunnel were driven by guttering and gadding.

9527. If the work were done by blasting there would be £1,250 more to pay? Yes.

9528. *Mr. Bagge* in his minute says : "Messrs. Carter & Co. have undoubtedly fixed their schedule prices speculatively to increase their profits on the contract as much as possible, and, if so, to the loss of the Department. Mr. Davis seems, therefore, justified in the suggestions made, as they would likely cause a saving of £1,000, and clause 55 of the specification is no doubt a saving clause against speculative prices."—He quite misunderstood your letter, evidently? No. What he said was thoroughly in keeping with it.

9529. He thinks you mean there would be a saving of £1,000, whereas you mean that it would cost £1,250 more? He thinks I mean just what I did mean.

9530. *Mr. Hickson* afterwards wrote this :—

While I think the Department would hardly be justified in adopting this unusual method of carrying out the work, it is very clear we should aim at getting our work done as economically as possible. Blasting may, therefore, be allowed on the understanding that the average allowance of 4 inches for concrete packing over and above specified size of tunnels be reduced to 2 inches.

That is thoroughly in accord with the two previous minutes. *Mr. Hickson*, on 23rd May, 1892, asked the contractors to call upon him. It is evident that the contractors saw him ; in fact I know that that is so. Between the 23rd of May, 1892, and the 26th May, the contractors called upon him and saw him in my presence.

9531. What took place? The contractors pointed out that if my recommendation were carried out the contract would not be completed under three times the contract time—that is to say, that it would take three times as long to drive a tunnel by means of guttering and gadding as by blasting. While they saw the force of what I had written from the departmental point of view, at the same time they wanted to get the concession of doing the excavation by means of blasting. To get over my difficulty they said they were prepared to allow for the concrete lining a sum equal to £1,250, which would mean the 2 inches referred to by *Mr. Hickson* ; and that being so it was to our advantage to let the work be carried out by blasting, as we should have done under ordinary circumstances. In this case, however, as I point out in my minute, in consequences of the prices—that is the way in which the contractors had fixed their prices—I considered it my duty to call attention to the matter.

9532. What was the urgency in connection with this contract ;—was the outlet built? The outlet was not built, but the urgency in connection with this contract was this—I am glad of an opportunity to explain it because the witness *Gilliver* rather threw out a suggestion which reflected to some extent upon the management of the Sewerage Branch—the urgency in connection with Contract 79 was simply this : The people of North Sydney required the sewerage at the earliest possible moment, and already an order had been made to give a little relief ; to that end a large quantity of reticulation was carried out before this contract was let. It was known before the contract was let that it would probably take two years to put down the shafts, drive the tunnel, and complete the work. It was thought when this contract had been under weigh for a matter of twelve months or so that everything would be ready for the letting of the outfall works at Long Bay, and that those outfall works would be finished simultaneously with the works on the main sewer. But after the contract was let and during its progress the Government, for its own reasons—and I know they were sufficient reasons—was not able to go on with sewerage work ; and that threw out the whole calculations of the office. Consequently Contract 79, which had been entered into, had to be finished, whereas the outfall works were not commenced.

9533. That does not get over the question of urgency. There was no absolute urgency in the matter? Yes. With the knowledge that we had at the time Contract 79 was let I am in a position to say that there was absolute urgency. As matters turned out—matters that we could not foresee—there was no urgency.

9534. During the course of the contract did the urgency cease? The urgency existed, but at the same time the Government were not able to go on with sewerage works. Consequently this large expenditure at North Shore is lying idle at the present day.

9535. *His Honor.*] You mean to say there was a difficulty in raising the wind? That is what it amounts to, and it was a matter over which the sewerage office had no control whatever.

9536. *Mr. Parkes.*] What was the office estimate for the excavation by blasting ; it does not appear to be included in these papers? I could not tell you.

9537. Will you furnish the Commission with the estimate that you made at the time? If it is among the papers, certainly.

9538.

9538. Is it a fact that when this contract was three-quarters of the way through you wrote a minute drawing the attention of the Engineer-in-Chief to the fact that, since the bulk of the profit was on the first items of the contract, the contractors might at any time cease, and that in that case the country might lose some thousands of pounds? I do not remember that minute. I know that the profit was high in the excavation of the shafts. J. Davis.  
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9539. In the shafts and the tunnelling? In the shafts, principally; and I know why it was put in. The contractors had to provide a most expensive plant, the shafts being deep.
9540. Did you not write a minute pointing out to the Engineer-in-Chief, when the the contract was three-quarters of the way through, that the work might at any time cease and leave the Government at a loss of thousands of pounds? I do not remember it.
- 9540½. Did you ever make a report to that effect? It is impossible for me to remember every report I write.
9541. Please tax your memory;—this report would be rather an important event, would it not? I do not remember a report of the kind, nor do I know under what circumstances I should be likely to write such a report.
9542. Is it not a fact that the contract did turn out in such a fashion that the profits were very great in the first portion of it—the excavation work? No; I should say that the profits were very great in the shafts, but I should not say that they were small upon other parts of the work.
9543. You are sure you did not write a minute to the effect I have named? I am not sure of it, but I have no recollection of it.
9544. Do you generally keep all the papers relating to a contract in one portfolio? All registered papers would go to records. A few scraps of paper which passed between myself and the inspector, which were not considered worth registration, were kept in my own office for reference when I required them.
9545. Every minute is registered, I presume? All the letters are copied into my letter-book. Every letter I ever wrote was copied into that book, and all the minutes I wrote would be copied there also.
9546. You have the letter-books and the registers of letters and minutes, I suppose? I believe so.
9547. They can be obtained? There might be a little difficulty in finding some of them, because, as has already been pointed out to the Commission, there have been several moves within the last three or four years. Some of the records were put in a room which took fire some eighteen months ago.
9548. Were any of your letters burnt then? I am not sure. Mr. Hungerford will be able to say precisely; but I know that a large quantity of old records would be there.
9549. Had you at any time to act severely with Reid, Carter, Gummow, & Co.'s manager? I had.
9550. On several occasions? On two or three occasions while he was at North Shore I had to take serious exception to his conduct.
9551. Upon the report of your inspector? He reported the matter to me and I went and investigated it.
9552. You found that he had been scamping cement work? I did not find anything of the kind. What was complained of was this—that he did not treat the inspector as courteously as he might have done; in some cases I think he went altogether beyond the bounds of propriety.
9553. What was the inspector doing to him when he treated him improperly? I assume that he was doing his duty.
9554. Was there not one instance where he was caught putting down dry metal without any cement—I mean the case which Wagg reported? He was not putting down dry metal in that case.
9555. You reprimanded him severely, did you not? Yes, because he wanted to put down as filling, at the back of the brickwork in a shaft, larger stones than should have been put down.
9556. Without cement? It was not a question of cement. It was a question of filling. The brickwork in the shaft had been built. It was a small shaft inside an excavation 6 by 5, I think, and the back of the brickwork had to be filled in with ordinary filling. As far as I remember, Inspector Wagg was not satisfied with the way this material was being put down the shaft, and Reid was saucy about it.
9557. Did not all the inspectors complain of this man? I do not think any of them but Inspector Reid and Inspector Wagg complained.
9558. Are you sure that a great number of other inspectors upon other jobs had not complained of him? Certainly not upon Contract 79. That was the first occasion upon which I had had any complaint made to me as to his conduct.
9559. Did you demand his removal? No.
9560. Why did you not do so—is it not a rule of the office that a contractor's manager shall be removed if he impedes the work? If there be sufficient cause for his removal.
9561. Was not there sufficient cause shown in Inspector Wagg's report? No.
9562. Did he not say that Reid always intimidated the inspectors? Not to my recollection. I found that it was not a case for removal. I saw the contractors about the matter, and I found that they had already reprimanded Reid. They promised me that nothing of the kind should occur again, and that they would see that the work was carried out according to specification.
9563. *Mr. Hickson.*] The meaning of the minute to which Mr. Parkes has referred upon page 305 is that we got the work done in a much shorter time, and at no extra cost? That is so. The work was done in a third of the time as far as the excavation was concerned, certainly.
9564. As to the urgency, so far as the sewerage branch is concerned, it existed then and it exists still;—it was really a question of money; the Treasury could not give us money to go on at the rate at which we had expected? No. They did not supply us with funds with which to carry out the arrangements we had in our minds. Our idea was to get the works finished simultaneously with the outfall works so that there might be no works lying idle without bringing in any revenue.
9565. That upset our arrangements generally throughout the sewerage works? Yes. The same thing occurred in the western suburbs. We spent large sums of money there, and the works brought in no revenue.
9566. We had arrangements made for commencing at the outfall and working inward so as to embrace the various areas of sewerage as the work proceeded? Yes. The disposal work was to be finished at the same time as the upper portion of the sewerage was finished.
9567. And that was the arrangement made in respect to No. 79 Contract when this minute was written? Yes.
9568. Do you remember Mr. Wagg's evidence in regard to defective work? I do not regard this filling as defective work. It was a matter of opinion as to whether the size of stone which was being put down should be put into the filling or not. 9569.

- J. Davis. 9569. It was not a question of concrete; it was a question of whether the stones were too big to go down into the filling? Yes; it was more a matter of taste than anything else.
- 17 July, 1896. 9570. *His Honor.*] Would it alter the interstices? It could not do that, because there was a sufficient quantity of small stuff to fill up all the interstices. What Inspector Wagg was afraid of was that as the stones descended they might damage the brickwork.
9571. *Mr. Gummow.*] You said that the contractors called to see Mr. Hickson upon the strength of the minute you had written upon the question of guttering and gadding? Yes; they called to see him between the 23rd and the 26th, I think.
9572. Do you remember whether anything was said at that time as to the injurious effects of guttering and gadding upon the men? Yes, I know that it was.
9573. Was not that put forward as a strong argument by the contractors? Yes; I know that Mr. Carter has a decided opinion as to the effect of that class of work upon the men.
9574. Have you not heard since that time that it is a class of work which has an injurious effect upon the men? Yes; I believe it is not as healthy as powder smoke, bad as that is.
9575. Mr. Parkes suggested that you may have written a minute to the effect that the contractors had the biggest profits in the commencement of that particular contract. Did they finish their work? Yes.
9576. Did they show any signs of throwing it up at any time? No.
9577. *His Honor.*] I want to discover who drew the schedules for these contracts? Mr. Bagge prepared all the schedules and specifications. He made all the estimates for new contracts.
9578. It is in evidence that all through these Sydney sewerage works subducts have, in point of fact, hardly ever been used at all: and I wanted to see whether you could explain how it was that, while the schedules continually provided for subducts in places where subducts might be expected to be used, they were finally not used at all, putting the tenderers in the position of being able to rig their schedules much more conveniently than if subducts had been left out? I admit that. It was a difficulty that occasioned Mr. Bagge and myself serious consideration. We had to provide for all kinds of contingencies in the schedule; and it was impossible to know before the tunnels were driven what kinds of material would have to be excavated—that is to say whether the ground was watercharged or otherwise. Although the probability was that in most instances no subducts would be required, still it was running a risk to leave them out. It is a well known fact to all those who have to do with contractors that if you have to get a price from them after work is let it is a very different price from that which you will get before the work is let; and, having regard to that fact, although we did run the risk to which you refer, still it was too serious a matter to leave it in the hands of the contractors to say after they had got the contract what should be the price for the subducts. That is the reason why a number of things were put into the schedules. They were put in on the off-chance of their being required.
9579. How were the quantities arrived at for the subducts? They were simply guesses.
9580. The best guesses you could make under the circumstances? It was not my guessing; it was Mr. Bagge's guessing entirely. He used his judgment in the matter. I have an instance in my mind in connection with the use of these subducts. In a sewerage contract running along underneath Liverpool-street, a part of the Bondi sewer, the ground was so exceptionally wet—it was all in rock—that subducts had to be put in. The work could not be constructed to the advantage of the contractor without them. He was called upon to make an excavation in the bottom of the tunnel and to insert pipes. I suppose he lost about £1,000 by it. His experience had been gained in an adjoining contract where he found that there were no subducts to be put in, as the ground was dry. He applied that experience to the contract I have spoken of, and he found that he was wrong. He eventually had to pay about £1,000 for the construction of the subducts. The contractors under the old system always speculated in that way. They took advantage of any item, and used their judgment as to whether it would be increased or decreased, and rigged their schedules accordingly. All kinds of means were tried to stop it, but we failed, and we found that the only way was to alter the system. In regard to this question of excavation, we got prices for guttering and gadding without any quantities. We knew that no guttering or gadding would be required, unless under exceptional circumstances. The contractors took advantage of that and put in a large price, and I know as a matter of fact—at least I have a very shrewd idea—that in one case efforts were made to bring pressure to bear upon the department to get the work done by guttering and gadding, so that it might be paid for at a high price. When we found that, leaving out the quantities in the schedule, we were not successful in obtaining a legitimate price for the guttering and gadding, the total excavation was divided into three parts. One third was put opposite to the item for excavation to be done by guttering and gadding, a third opposite to the excavation to be done by means of blasting with 4-in. charges, and a third opposite the excavation to be done by means of blasting with 2-in. charges. But even this was not successful. The prices that the contractors attached were still unsatisfactory. The conclusion which was arrived at was that there was no course open whereby a legitimate price could be obtained for the work except by the office fixing the rate opposite to each item, and requesting the contractors to tender above or below, or at the rates in the schedule.
9581. *Mr. Parkes.*] Is there not a clause in your specification giving you full control over these schedules, so that if you find any trickery going on you can adjust them? That would be a most objectionable course for the department to take. I do not think there is such a clause. (*Vide Appendix No. 36.*)
9582. *Mr. Gummow.*] Had the firm of Gummow & Gillan anything to do with the contract of which you have spoken, in which the contractor tried to get the guttering and gadding? No.
9583. Had Carter & Co. anything to do with it? No.
9584. *Mr. Hickson.*] As regards the question of putting items into schedules which were not required, has it not been found from experience that it is better to put in every item which may arise in connection with the contract? Yes, and for the reasons I have given.

MONDAY, 20 JULY, 1896.

William Scarlett Delisle Roberts :—

- W. S. D. Roberts. 9585. *Mr. Parkes.*] You are cement tester for the Department of Public Works? Yes.
- 20 July, 1896. 9586. Do the contractors themselves apply to the Department to have their cement tested? I do not think they have ever applied; they have no need to apply.
9587. There are parcels of cement brought in to be tested? Samples selected by the Government Inspector. 9588.



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- 9588 Are the whole of the casks which are tested marked? Those which are in bond. We mark no cement already delivered on the works. That cement is kept, I presume, in the proper sheds upon the works until it has been tested and accepted or rejected.
9589. Is the cement which goes on to the contractors' works tested? All cement used in the work is tested.
9590. Would it be possible for any parcel of cement to go into the work which has not been tested? That is a matter outside my province altogether.
9591. Is not the number of casks required by the contractor to be tested kept in your test-book? The number of casks is recorded according to the inspector's or engineer's report.
9592. When tests are made they are minuted in a book? In the certificate book.
9593. That is what you call your test-book? Yes.
9594. Will you look at 1330? Yes; 600 casks were tested, I see, for Carter, Gummow, & Co., selected at sewerage contract No. 77.
9595. There are two entries of figures representing the number of casks at the top of the page to which you have referred, one in red ink and the other in black ink;—which is the correct number? The black ink should always be the correct number.
9596. What does the red ink number signify;—it does not mean that the whole parcel is over 1,000 casks, does it? No; it means that there is some difference in the information obtained. It means that there is some doubt as to whether the number of casks is 500 or 600.
9597. The parcel is always minuted as you have it there? Yes.
9598. The contract to which the cement goes is always put in this record? Yes; and the names of the contractors are inserted if I have the names in the application.
9599. Otherwise the number of the contract is inserted? Yes.
9600. So that it would be impossible for cement to be sent to a job without appearing in your register if the inspector did his duty? I believe it would be impossible.
9601. You say that if the inspector did his duty it would be impossible? I believe it would be.
9602. Will you turn to the certificate under date 5th December, 1895? Yes; it was a sample of cement selected on 4th December, at contract 118, from a shipment of 1,360 bags.
9603. Was it approved of;—did it pass your test? No; it did not.
9604. Will you now look at certificate No. 1,364? Yes; that is a test of cement selected on 8th January, 1896, from a shipment of 2,000 bags. That was afterwards re-tested.
9605. Will you now turn to certificate No. 1,378? Yes; that is a test of cement selected on 12th February, 1896, at contract 118, from a shipment of 1,500 bags. In that case the twenty-eight days' cold test was a good bit below the minimum. It passed in the other tests.
9606. From that time forward John Try's cement was rejected? I believe that was the last test. I can find no tests after that.
9607. *His Honor.*] But was the cement altogether rejected? As far as I can see from this book it was condemned from that date; but in order to make certain I should prefer to refer to the summary of tests of different brands. Upon referring to that I find that No. 1,378 was the last test made of John Try's cement.
9608. *Mr. Parkes.*] The twenty-eight days' cold sand test is a very important test, is it not? Yes; it is an important point.
9609. From where did the sample come in the case to which you have just referred? It was selected from contract 118.
9610. The cement was out there? It was evidently out there.
9611. What has since become of that cement, do you know? That is not under my control at all.
9612. At one time the contractors used to fetch their samples to the office, did they not? I have not heard of it.
9613. Have the inspectors always brought in the samples? It is the duty of the inspector, or someone he can trust, to bring in the samples.
9614. When a sample has been accepted does the inspector mark every cask in the parcel? That is a matter altogether out of my province.
9315. But is it not the rule of the Department? Not that I am aware of.
9616. Do you not know that the casks are marked? Not on the contract, I think.
9617. But supposing the cement is in bond? In bond the casks are always marked before delivery to the contract.
9618. How are they marked? The brand of the Public Works Department is stamped upon them.
9619. Does the brand denote the contract to which the cement is to be sent? No; it is merely marked showing that it belongs to the public works.
9620. *His Honor.*] Is the brand to which you have referred put on the casks only after the cement has been passed? It is put on after the cement has been passed and before it is delivered.
9621. It indicates that the cask contains passed cement? Yes.
9622. And you say that that is not done in the case of casks on the work? Not on the works, because it can be kept in a store on the works under lock and key.
9623. *Mr. Parkes.*] Is not the key always kept by the inspector? I do not know. That is outside of my work altogether.
9624. As a matter of fact, do you not know it to be a rule of the office for an inspector to keep the key? I should say that someone ought to look after it in some way or other to see that it is not changed.
9625. But is it not a regulation of the office that the inspector shall keep the key? Not that I am aware of.
9626. *Mr. Davis.*] I want you to refer again to No. 1378;—that would indicate that 1,500 bags of cement had been delivered to Carter & Co. at contract No. 118? Yes.
9627. From whom would you get that information? From the person who applied for the test.
9628. You would therefore depend for this information entirely upon the inspector who happens to send in the sample, and the application for the sample to be tested? We depend upon that entirely. It is sometimes rather difficult to obtain exact information. Sometimes I have merely verbal information.
9629. Is it not a fact that I have had repeatedly to complain to inspectors as to the imperfect information which they have supplied when sending in cement for tests? Yes; that is a fact. I myself have mentioned the matter to you.



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9630. And in the face of that you would not be prepared to swear that all the information given at the head of these certificates is correct? I can only say that it was given to me as correct.
9631. Your duties are entirely confined to the cement testing-room? Yes.
9632. You have nothing whatever to do with the delivery of cement on the work? No.
9633. You have nothing whatever to do with the selection of samples? No.
9634. You have simply to test the samples which are delivered to you at the testing-room? That is all.
9635. And the information supplied to you by the inspectors, at the time they forward the sample, is copied by you into the book before you? Yes; I have to take it for granted that it is correct. There is one point concerning the page to which Mr. Parkes first referred me which I might mention—that is, as to whether the number of casks would be 500 or 600. I could not say definitely whether there would be 500 or 600 casks, but the fact of one number being in red ink and the other number being in black ink would denote that I had some doubts on the point.
9636. Coming to what you said was rather an important point, that is, the failure to comply with the twenty-eight days' cold test, it has often happened, has it not, that when cement has passed all the other tests but one fairly well, and in the one case has come within a small percentage of the standard required, it has been passed? Yes; it would be hardly right to reject a cement which came within a small percentage of the minimum in one test only and which passed all the other tests.
9637. As to this particular test, you do not know whether the cement was kept and re-tested? I cannot say.
9638. Will you describe the tests you made after receiving a sample from any particular parcel—take, for instance, the gravity test? The specific gravity of cement is put down by most authorities as being, for good cement, over 3. Therefore, we have the minimum of 3 for specific gravity. If it is under that it is supposed not to be good. In this case the specific gravity was 3.028.
9639. *His Honor.*] The cement comes to you in the form of powder? Yes.
9640. How do you take the specific gravity—in what form do you take it? In powder before it is hydrated. It is taken in some fluid which will not harden it, such as oil or kerosene.
9641. Is it poured into a mould, or what is done? It is weighed. We know the specific gravity of the fluid, and we know the volume of the fluid that is put in. We know the weight of the cement in the air, and the weight of the bottle with the fluid and cement, and, knowing that, we can arrive at the specific gravity.
9642. *Mr. Davis.*] Take the carbon dioxide absorbed by three grammes of cement? Yes; if the cement absorbs too much carbon dioxide it is pretty clear proof that it has a large percentage of lime not combined.
9643. *His Honor.*] By carbon dioxide you mean carbonic acid gas? Yes.
9644. What would be the effect of too much uncombined lime in the cement? First of all you have less active material for hardening, because the lime is not combined with the alumina and the silica. Therefore, you do not get the hardening properties which you would otherwise get.
9645. What would be the effect upon the mass in position, supposing there were free lime of the description you speak of? It would mean that in some instances where the concrete is in a place where water would percolate through it the free lime would be washed out. It would be soluble, and the washing out would create spaces within.
9646. *Mr. Davis.*] Take the sifting test, No. 4? That is the weight as received unsifted per imperial struck bushel.
9647. That gives you an idea as to whether the cement is fine or otherwise—it is a confirmatory test for Nos. 5 and 6? Yes. It is a test which is not regarded as of much importance, because in the present day they make cement much finer than they used to, and the fact of its being very fine makes it appear lighter in weight. The minimum is put down at 100 lb. by the imperial struck bushel. Anything under that is not accepted. But supposing it is a fine cement, it might be of far better quality than coarse cement over that weight.
9648. You do not, therefore, regard No. 4 test as being of great importance? No.
9649. Tests Nos. 5 and 6 have to do with the fineness of the cement, and they are of great importance? Yes.
9650. What do you do to ascertain the residue from the cement? It is sifted through different sized sieves. There is a sieve of 6,400 meshes to the square inch, and also a sieve of 14,400 meshes to the square inch. The residue is taken from these sieves; the maximum allowed, in the first instance, being 20 per cent., and in the second 30 per cent.
9651. So that if cement has a residue in the sieve of 6,400 meshes to the square inch equal to anything less than 20 per cent., it will be good cement? It will be moderately good cement as far as the residue is concerned.
9652. In the case of 1378 it is only 8.31 against the maximum of 20 per cent.? Yes.
9653. And in the case of the 14,400 mesh to the square inch sieve, what is it? 12.6 against a maximum of 30 per cent.
9654. How do you make the tension tests? They are made by first mixing the cement with a certain proportion of water and putting it into moulds, and then after the first day immersing it in water for various periods. At the end of these periods the cement is taken out and broken by tension.
9655. You are very careful when you put the briquettes into water after having made them that the water is kept at a fairly uniform temperature? Yes. We have a gas stove for that purpose.
9656. The quantity of water you put into the neat cement briquettes and into the 1 to 3 sand briquettes varies with the fineness and condition of the cement? With the quality of the cement. Some cement requires a great deal of water; other cement a wonderfully small quantity of water.
9657. You have a machine for ascertaining the quantity of water that should be put into briquettes in order to obtain uniform comparative results? The machine is based upon the principle that if cement is kept under a certain pressure under water it will absorb a certain quantity of water. We have a standard pressure of 1,400 lb. to the square inch. The cement is put into a mould and is pressed down, and is allowed to absorb water for two hours. The percentage absorbed is taken as a guide to work upon as to how much water to put with the cement when making the briquettes.
9658. You are in a position to state that the utmost care is exercised in the testing of cement in the Department of Public Works? We take the greatest care we can; in fact, we often have tests completely taken over again in order to satisfy ourselves if we are not thoroughly satisfied in the first instance.
9659. Upon special occasions you make the test extend over many years? Up to five years.

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9660. You have taken a great interest in the testing of cement for years past? Yes; when I was under Mr. Bennett, he asked me to take the matter in hand and to ascertain whether I could not improve upon the system. I have since done my best to do so.
9661. You are acquainted with all the newest methods adopted in England, on the continent of Europe, and also on the continent of America? Yes; I have obtained the latest information through the various journals.
9662. Is it not the fact that all the newest methods which, in your judgment, and in the judgment of the office, are of any value have been adopted in the cement testing room? I think they have.
9663. If inferior cements were being imported into the Colony and were submitted to you for test, would you be able to discover the inferiority? We should be able to do so.
9664. You are absolutely sure about that? Yes.
9665. You have had experience in other parts of the world in connection with cement? I never had any experience in the testing of cement before I came to New South Wales.
9666. From your experience in the testing of cement since you have been here, and from your reading, should you say that the cements which are used upon the works of the Public Works Department must of necessity be of the best possibly quality? I think our tests are as severe as, if not more severe than, those of any other country.
9667. Quite as severe as those in any of the other Colonies? They are certainly more complete than those in any of the other Colonies.
9668. Is it not a fact that merchants have repeatedly complained to the Minister and to the Engineer-in-Chief of the severity of our tests? Those who do not get their cements passed naturally do complain; but the importers of the best cement do not complain.
9669. Good cement will pass through your tests all right without any trouble? Yes.
9670. Among your tests you have a test of the tensile strength after seven days in Deval's hot bath? Yes.
9671. Is that not considered by importers to be a very severe test? It is considered by some of the importers to be a very severe test. Some of the German manufacturers cannot keep up to it, whereas the English manufacturers generally go above it. They show to advantage in that respect.
9672. Any defect in the cement to which that test would apply would be discovered? It discovers at once the presence of a very small quantity of unslaked lime.
9673. This test would infallibly discover the existence of too great a quantity of unslaked lime? At once.
9674. *His Honor.*] Is cement supposed to contain no anhydrous lime at all? No; the lime is never thoroughly slaked. A small proportion of unslaked lime would not do any harm. The test of absorbing carbon dioxide applies to the slaked lime, and this latter test to the caustic lime.
9675. *Mr. Davis.*] You would not like to say that this book contained a record of all the cement which has been used upon any given contract? I could not tell you. I have no information whatever upon that point.
9676. *Mr. Gummow.*] As to John Try's cement, what is your opinion of it as a cement? My opinion of John Try's cement up till last year was very high. He had taken a great deal of trouble for many years under great difficulties, I believe, in trying to work out the correct theory for making good cement. He succeeded very well in small quantities, and his cement passed a better test than did any other cement which has been manufactured in the Colony—in fact, none of the colonial cements could compete with his in the hot sand test. But since he left the Colony his works seems to have fallen off, and the last few tests were not up to standard. There seems to be a good deal of caustic lime in the cement, and that destroys its quality.
9677. *His Honor.*] When did he leave the Colony? At the end of last year or the beginning of this year.
9678. It was just then that your tests showed his cement to be falling off? Yes.
9679. That would be in December, January, and February? Yes.
9680. *Mr. Gummow.*] Do you not find in new cement a certain quantity of free lime? All cement contains a certain amount of caustic free lime, which should be slaked; but there should not be a large proportion. If the proportion is too large no amount of time will do it any good. Time of course will slake it, but then the cement will never be of proper quality.
9681. Do you not find that, by keeping cement which has a little too much free lime at first, the cement is afterwards benefited? The fact of keeping it would benefit a cement with a small proportion of caustic lime. Almost every cement has a small proportion of it. Therefore it is not advisable to use it fresh from the kiln.
9682. A good deal of cement that contains lime gets hydrated in coming from Europe? To a certain degree.
9683. Have you made any tests with regard to the porosity of cement? I have come to the conclusion, after a good many tests, that the porosity of cement in itself varies very little. Good cement, when mixed with sand, varies only according to the quality and proportion of the sand.
9684. What would 1 to 1 mortar stand without letting any quantity of water through? A 1 to 1 mortar ought to be practically impervious after a given time.
9685. Under what head of water? I have not tried it with a great head; the greatest head I have had has been 6 feet.
9686. And you find it impervious with a head of 6 feet? It is pervious at first until the cement has time to thoroughly harden.
9687. *His Honor.*] How long would you give it? One month at least.
9688. *Mr. Parkes.*] When the figures given as to the number of casks are doubtful, you mark them in red ink in your test-book? In the case to which you referred I marked the figures in red ink because the number was doubtful.
9689. Are there not other cases where you have marked the figures in red ink when they have been doubtful? I have sometimes done so.
9690. As a matter of fact the most important test in the case of cement has reference of its durability, as to whether it will stand for any number of years? Of course cement-work has to be durable. Consequently that is a most important point.
9691. You have looked up your record of the tests of John Try's cement, and you find that the test to which you referred this morning was the last test of that cement you made? Yes.

9692.

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9692. What is the falling off in the test in the twenty-eight day's cold water bath? There is not a falling off at all in the twenty-eight days. It increases to 168 lb.
9693. But what is the standard? Two hundred pounds.
9694. *His Honor.*] You are referring now to the tensile strength? Yes.
9695. That is a square inch section? Yes.
9696. *Mr. Parkes.*] Have you any compression tests? No.
9697. With regard to the porosity of the cement, how many tests have you made;—did you make many tests or only one? It is some years ago now. I made a great many.
9698. With what cement? With various qualities of cement.
9699. Did you make the tests in a bath, or what method did you adopt? We had an apparatus specially designed for making the test.
9700. In all the tests you made did no water get through? Did the cement itself keep the water from going through in all the tests? The neat cement was impervious after a given period.
9701. And when mixed with sand, what results did you get? That would depend entirely upon the quality of the cement and the sand. 1 to 1 mortar would be after a time impervious.
9702. Would there be no appearance of moisture on the underside of the disc? For a certain time, but it would afterwards be dry.
9703. In all the tests you made with the 1 to 1 mortar were you successful? I cannot say without referring to them. They were made a long time ago. I know we found that neat cement was perfectly impervious after a certain time.
9704. *His Honor.*] What is the twenty-eight days' test you have spoken of—the test under which the sample of John Try's cement failed? It is the tensional strength after twenty-eight days in cold water.
9705. When you are testing a lot of cement I suppose you cannot wait more than a certain time, and twenty-eight days is your limit? Yes.
9706. Then, if you reject the cement upon the ground of the tensional strength being under the standard, after twenty-eight days, do you continue the test so that you may be in a position to tell what the tensional strength is after a longer period has elapsed? We often keep the cement for a longer period. We make up some of our tests to five years. We can get results at any time. They are recorded after twenty-eight days for reference. The twenty-eight days' test is considered the final test.
9707. In the case of this particular cement the tensile strength after three months was 258 lb.? Yes.
9708. What is the minimum standard required after three months? 275 lb.
9709. In point of fact, then, this cement has never passed the testing-room as far as tensile strength is concerned? No, it has not passed the test as far as tensile strength is concerned.
9710. If it did stand the test after a further lapse of time—that is, if the tensile strength increased to your standard—would you then pass the cement if everything else were right? It would be hardly fair to deal with it in that way, because in the meantime the cement might have deteriorated. You would require to test it again to find out that it had not deteriorated.
9711. In what respect would it deteriorate? Cement is rather an unstable compound. If it be kept exposed to the air in any way it generally decomposes. Some cement will decompose much faster than others.
9712. What chemical change takes place? It decomposes.
9713. That applies to the lime, of course, but to what other parts;—I thought that the principle of cement was that it was all in an uncombined state;—is it really decomposition or combination which goes on? I am referring to unhydrated cement in a state of powder. In that case decomposition would go on.
9714. But what is the decomposition;—what are the component parts of the cement? The principal components are a double silicate of lime and alumina, silicate of lime, aluminates of lime, and ferrite. Some of these are feeble compounds, and some are more stable compounds. The feeble compounds would be liable to decompose from exposure to the air.
9715. It is the lime compounds that decompose by the action of the carbon dioxide? That is the main reason, combined with a certain amount of dampness, of course.
9716. All changes which take place after setting are, in the case of good cement, favourable and strengthening? Yes; the strength increases by hydration and crystallisation.
9717. That is all in favour of the stability of the cement? Yes.
9718. *Mr. Davis.*] As to the 28 days' test—is it not a fact that the exigencies of work often make it necessary to decide whether cement is to be accepted or rejected upon a 7 days' test? A few years ago it was always accepted or rejected upon a 7 days' test. Twenty-eight days was considered too long a period to wait.
9719. It is difficult for contractors to make arrangements to keep a sufficient stock upon the works to permit of their waiting for a 28 days' test? Yes.
9720. As a matter of fact, you yourself do not pass or reject cement; that is left to the Engineer-in-Chief? Yes.
9721. Your part of the business is simply to make the tests and record the results? Yes.
9722. *His Honor.*] And to report? Yes; to report on the facts.
9723. To the Engineer-in-Chief? Yes.
9724. *Mr. Davis.*] As to the doubt in your mind as indicated by the two sets of figures at the head of some of these certificates, one in red ink and the other in black ink;—when you put in the red figures, I presume you would hear from someone that there was a doubt as to the number of bags or casks in the parcel? Yes.
9725. There might have been uncertainty in connection with other tests without your hearing anything about it? Yes.
9726. *Mr. Parkes.*] Who gives you these returns? The information for the tests is conveyed to me upon paper through the proper course.
9727. What is that course? It is to send in an application for a test.
9728. How would that be sent? Through the Engineer in charge of the contract.
9729. To whom does he send it? He sends it either to me or to the Engineer in charge of the office.
9730. Who would that be? In the present instance, Mr. Carlton.
9731. In former instances, who would it be? Mr. Davis.
9732. *Mr. Gummow.*] With regard to the sands;—you have tested the Nepean sand, crushed sandstone, and the Surrey Hills sand? Yes, sand from most of the districts round about Sydney. 9733.

9733. Do you remember testing any crushed sandstone that came from the Gas Company's quarry at North Shore? Yes; I think I made two or three, or perhaps four, tests of that sandstone.

9733½. Have you made any other tests of crushed sandstone? Yes; I think in connection with Contract No. 118.

9734. In connection with any others? Yes, various contracts.

9735. What opinion have you arrived at as to the strength and value of crushed sandstone for sand? We arrived at the result that some of the crushed sandstone was very good sand to use with cement on account of the uneven size of the grain permitting it to take up space which would not otherwise be filled up by sand. Owing to the uneven size of the grains, a certain quantity of superfluous cement would not be required to fill up the spaces.

9736. *Mr. Parkes.*] In other words, you say that fine sand would take the place of cement? It would to fill up the voids, but the cement gets around each particle of sand as well, and the whole mass would be just as solid as it would otherwise be.

9737. *His Honor.*] The particles you would find in cement would be infinitely smaller than the average grains of sand? Infinitely. It is following out the principle which is used in all concrete—that is, to take certain sized stones and to mix them often with material of smaller quality and then with sand and cement, the whole of the material being afterwards cemented together in a solid mass. The more uneven the aggregate is the less cement would be required to do the same amount of work.

9738. *Mr. Gummow.*] As regards strength, did not some of the results you obtained from crushed sandstone exceed your standard? In some cases we got high results.

9739. Have you found that in a number of cases the crushed sandstone has given higher results than has the Nepean sand? In some cases it has been found to give perceptibly higher results than has the Nepean sand, and for the very reason that the cement required to fill up the voids is not so much as would be required with an even sized grain of sand. You fill up the voids with small grains of sand and stone and you get a greater strength.

9740. *His Honor.*] The addition of the cement to the sand does not increase the original bulk of the sand? It should not increase the bulk much. In all instances it does increase it a little.

9741. Does the bulk diminish as you go on mixing dry? I am speaking now of mixing wet.

9742. Do you not mix dry before you mix wet? Yes; we mix dry at first.

9743. Is not that one important element in the matter—thorough dry mixing before wet mixing? I do not think it is very important, because the material cannot be thoroughly mixed when dry.

9744. It is only after the wetting, you say, that thorough mixing takes place? The mixing after wetting is most important, because the cement then adheres to every particle of sand that is turned over.

9745. *Mr. Gummow.*] You have seen different qualities of Nepean sand? There are at least two qualities of it—some is fine and some is coarse.

9746. Have you ever received these two qualities for test? Yes.

9747. Upon contracts? I cannot recollect now where they came from.

9748. Have you ever had any occasion to condemn Nepean sand;—have you ever found that it did not go up to the standard? I do not remember that; Nepean sand I have found to be one of the best sands.

9749. Have you ever tested sandstone crushed by a rock breaking crusher? Yes; I have tested crushed sandstone which I have been told has been crushed.

9750. Was it of a very fine description, like powder? I cannot recollect these points now; I made the test a long time ago.

9751. Did the sand come up to your standard? I should have to know to what contract you are referring before I answered that question.

9752. Take Contract 118? I do not recollect; but I may say that the passing of the sand would not be part of my duty at all.

9753. But as regards the tests, did you find that the sand was of the requisite strength? I think I remember now that some crushed sandstone was sent in from Contract No. 118; I remember it came considerably above the minimum tension and crushing strength.

9754. Can you tell His Honor whether, as a matter of fact, there is any clay in crushed sandstone? I should have to refer to the tests to ascertain those particulars.

9755. *His Honor.*] Have you tested any of the sand chemically for clay? I merely wash it and record the percentage which is capable of being washed out.

9756. Have you any recollection of what you have found in the Sydney sandstone in that relation? As a rule 1 or 2 per cent. is generally washed out. In river sand, of course, none is washed out.

9757. Suppose the clay is not washed out and that the crushed sandstone is used as sand without washing, how would that affect the cement? It would not be so good as sand which had been thoroughly washed.

9758. Would 1 or 2 per cent. of clay in the sand lead finally either to disintegration of the compo. after it had set or to a gradual shrinkage of the whole mass? I do not think 1 or 2 per cent. of clay would lead to either of those things. It would require a much larger percentage to bring about shrinkage. I do not think there would be the slightest shrinkage of the concrete after it had been mixed with water, no matter how much clay there might be in it. The clay might be washed out and voids might be left, but the concrete itself would not shrink.

9759. Are you referring now to a shrinkage in the setting or to a subsequent shrinkage? I mean after it has set. Of course when it has set the clay would be incorporated in the set cement. It might afterwards get washed out, and it would also have a chemical action on the cement; but the washing out could not possibly make the mass of concrete shrink in volume. The mass would be perfectly hard. It might become honey-combed as a consequence of the washing out of the clay, but I cannot see that there would be any other result.

9760. From the particles of alumina parting with the particles of water which remained in association with them, and the thorough setting of the other materials in the cement—that would happen? Yes.

9761. How long would it probably take if such a thing did happen? We have no record of how long it would take.

9762. *Mr. Gummow.*] Do you remember making any tests for Carter, Gummow, & Co., of blocks which they had made and brought to the office? Yes.

9763. Can you remember the work in connection with which these blocks were tested? In connection with the Monier arches.

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9764. Do you remember if any of the blocks had been cut out of the arches tested two years ago at North Sydney? Yes; I remember that.
9765. Did you see the construction of those arches? Yes.
9766. Was the sand washed before it was put into them? If I recollect rightly, Nepean sand was used.
9767. You do not know whether it was crushed sandstone or not? I have a notion that it was Nepean sand.
9768. Do you remember some tests being made with 6-in. cubes made by Carter, Gummow, & Co., some twelve months ago? Yes; 6-in. cement mortar cubes.
9769. Do you know what they were composed of? Of the same material which was to be used in the Monier arches.
9770. Do you know what sands we used for them? Various sands, I believe.
9771. *Mr. Davis.*] You produce a test sheet containing a series of tests made in the departmental testing room of compos. of 3 of sand to 1 of cement? Those are the tests referred to by Mr. Gummow, made by the Department from samples used in connection with the Monier arches upon Contract 77.
9772. What sand was used? Fine sand, the North Sydney quarry sand, and coarse and fine Nepean sand.
9773. Were these comparative tests made to your knowledge with a view to find out which would be the best sand to use in the Monier arches upon Contract 77? Yes.
9774. Which sand gave the best results according to that test sheet? The North Sydney quarries sand gave the highest results in all these experiments—2395·5, 2208·0, 2087·0, 2226·0. Those figures represent the crushing strength per square inch in pounds.
9775. These are compression strains? Yes; those results were obtained against results from the Nepean coarse sand, which was the next best, as follows:—1172·2, 975·0, 1244·4, 1036·0, 1115·0, and 1205·0.
9776. What did the fine Nepean sand give? 757·5, 958·6, 895·2, 1409·0, 1735·0.
9777. You made no tension tests? No; that would not be necessary.
9778. You know the ratio of tension tests to compression tests, and, having that knowledge, you could calculate the tension strains if necessary? Yes. They are calculated at one-seventh to one-tenth.
9779. The tensional strength is one-seventh to one-tenth of compression strength? Yes.
9780. Seeing that the strains to which this sand would be put would be only in compression, compression strengths alone were considered? Undoubtedly.
9781. *Mr. Gummow.*] What is the date of the document from which you have read? The 20th August, 1895.
9782. As to clay or any other foreign matter in these sands, is it not a fact that any foreign element of that description would always show itself in compression and tension tests by decreasing the strength? A foreign element like clay would, if it were present in an excessive quantity, show itself in compression and tension as well.
9783. *His Honor.*] Would a low percentage have any effect at all? A low percentage would take up such a small amount of room in the mass that the difference in strength would not be perceptible. Even if there were a void it would not be perceptible.
9784. *Mr. Davis.*] You may regard the presence of clay as creating so many voids? Rather more than that. The clay has a certain action upon the cement chemically.
9785. *His Honor.*] What is that? In preventing it from hardening if the clay is in great excess. It is, therefore, always advisable not to use sand containing too much clay.
9786. Does it prevent the material from setting? No; from hardening.
9787. *Mr. Davis.*] Would you say that all the material you washed out of sand in the making of your tests would be clay; would not a portion of it be likely to be something else? Well, we simply say that it is capable of being washed out, which is putting it in the most practical way.
9788. Referring once more to the effect which clay would have upon the shrinkage of concrete from the experiments you have made, are you in a position to say absolutely that if clay were present in small quantities in either compo. or concrete the effect would be—supposing the clay were washed away—to leave the structure honeycombed; would it have no effect upon the shrinkage of the material in mass? I do not think the question has been thoroughly settled yet in any part of the world; that is, the question as to the quantity of clay which might be present in cement without doing it any harm.
9789. *His Honor.*] Whatever mischief is caused is not caused by the disappearance of the molecules of alumina but by the disappearance of water which remains in that peculiar association with alumina which no one can find out? The cement would take up the water from the alumina, and if there were a void it would be created by the smaller volume of alumina remaining.
9790. *Mr. Davis.*] You have the same thing in ironstone; you sometimes find a small kernel which has been created by clay and organic matter; this is eventually washed out, leaving a honeycombing such as you would expect to find in concrete if clay were present in small quantities? That is one of the theories which I have heard advanced.
9791. *His Honor.*] If the molecules of clay were generally distributed right through the whole mass of set concrete or compo., would there not be a general shrinkage by the departure of the water associated with the clay, either by combination with the surrounding material or by evaporation? The concrete in that case would be too solid—too hard a mass to shrink. It might become honeycombed, or if there were anything present to disintegrate the cement, a part of it might fall to powder. Something of that sort might happen, but I do not see how the mass could possibly shrink in any way. There is not sufficient elasticity to permit of shrinkage.
9792. You possibly noticed that Mr. Young, in his evidence, said that he had experience of set concrete shrinking some years after it had set; he ascribed it to the presence of clay in the sand;—how would you explain it? I have not seen it, and I do not believe it can happen.
9793. The shrinkage, according to Mr. Young, showed itself by cracks? There might be cracks, but there would not be any shrinkage of the mass itself.
9794. You would put it down to some cross stress which had not been allowed for? Cement cracks from many causes; the presence of a certain quantity of caustic lime will crack cement.
9795. The presence of lime would actually cause expansion, would it not? Yes.
9796. You think that if such a thing did occur it would be due most likely to the presence of lime? Yes.
9797. *Mr. Davis.*] I should like you to be quite clear on this point—as to whether the presence of clay in the samples of sand when tested would not be discovered in the compression and tension tests? There is only one standard sand used in these tests as recorded in the book; but, in testing sand from different places, I should certainly say that any excessive quantity of clay would be discovered by the compression or tension strength when the sand had been mixed with the cement.
- 9798.

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9798. At the time you test the sample sand that is submitted to you is it not a fact that you make up from the same cement, under the same conditions, briquettes made with sand which you regard as standard sand, that standard sand being always of a uniform quality, and that the sample of sand that is submitted is in that way compared with the standard sand of the testing-room? That is so.

9799. So that you would know absolutely whether the sand submitted for test contained any injurious element? We should certainly know whether it contained any element injurious to strength if we tested the strength of it.

9800. *Mr. Gummow.*] Besides the briquettes or blocks I mentioned, have you tested any other blocks for us? I do not recollect now.

9801. Did you ever test any of our Monier plates? Yes.

9802. Can you give us the particulars of the test? I tested some Monier plates made by your firm. The plates were 2 inches thick, and we found them in excess of the strength of ordinary plates of cement and sand.

9803. *His Honor.*] I suppose you tested them with a cross strain? Yes.

9804. *Mr. Gummow.*] Have you any idea how much stronger than ordinary plates they were? I am afraid to say now; I have not the particulars before me.

9805. *His Honor.*] Have you any idea, roughly, as to how many times stronger the plates proved to be in resisting the breaking strain than compo. plates of the same thickness would be? If I recollect rightly, they were found to be about seven or eight times as strong as ordinary compo. plates.\*

9806. *Mr. Gummow.*] Do you consider that our firm have taken more than an ordinary contractor's interest in the testing of cement and compo.? As far as my experience has gone, I think the firm of Carter, Gummow, & Co. have taken the greatest interest in obtaining information, with a view to the getting of good material. They have shown a greater interest in that matter than have any other Government contractors with whom we have had to deal.

9807. Do you know whether Carter, Gummow, & Co. have had to pay for some of these tests? I was going to say that they also had to pay for the tests.

9808. *His Honor.*] What are you by profession? An engineer.

9809. Are you a chemist? No; I am an engineer who has been obliged to make a study of chemistry in order to learn his own profession thoroughly.

9810. You have made chemistry more a speciality than have most engineers? Of course, being placed in the position in which I am, I have had to find out all the peculiarities of cement and other material.

George Dawson recalled and further examined:—

9811. *Mr. Parkes.*] On 1st July you gave the following evidence:—

6724. Did you work on the Glebe job? No.

6725. Did you work on the Annandale job? Yes.

6726. Was there any defective work done there? Casks which had been opened there were sent over to the shed to be filled with cement which I was told had been condemned. We were supposed to break them up, but when the heads were taken out we were ordered by the ganger, Bandeden, to take them to the shed, where they were filled up with cement from bags.

6727. Do you say the cement was in bags? Yes. It was taken from them and put into the casks.

6728. Where did it come from? It was Cullen Bullen cement, I think; I never noticed the brand.

In what direction did the Annandale job run? Down towards Johnstone's Creek.

9812. Where were the bags of cement to which you referred? In the cement shed, with the casks.

9813. How many bags would there be? There might be 4,000 or 5,000 for aught I knew. There was a big stack of them.

9814. Is it true that the men used to fill up casks from these bags? There was one man in the shed filling them.

9815. When was that? About February or March of this year.

9816. Was that cement still on the work when you left? Yes; on the day I left.

9817. Was there any great quantity of cask cement? Yes.

9818. Would there be 500 casks? There would be more than that, I dare say. I remember opening the shed one morning and seeing that it was chock-a-block with casks.

9819. When the casks were empty what was done? The heads were taken out, and the empty casks were sent over in the dray to the shed. There was a man there to fill them, and one day I saw him filling them. The casks came back to us refilled and reheaded.

9820. What was that man's name? Cady.

9821. Did you see any brand on the bags? I never noticed any.

9822. *Mr. Parkes.*] Who was the Government Inspector on that job? Mr. Lockyer, I think.

9823. Was Mr. Rudolph Government Inspector there? No.

9824. Or Mr. O'Hanlan? No.

9825. *Mr. Smith.*] It was only on this one occasion that you saw the men filling the casks with cement? Yes.

9826. How many of the casks were there empty then? I could not say. They used to send over 11, 12, or 13, as the case might be.

9827. Did you send them over on more than one occasion? On several occasions.

9828. Who was working with you when you sent those empty casks over? All the crowd were there together.

9829. Who were the crowd? I cannot enumerate them all.

9830. But can you enumerate some? There were Martin Byrne, Jim Driscoll, Tim. Gollagher, Dick Churchman, and others.

9831. Did you see these bags of cement in the shed? Yes.

9832. How many did you see? There might be 3,000 or 4,000. I cannot say how many, but there was a big stack of them.

9833. Was the Inspector about when these empty casks were returned to the shed? The Government Inspector stopped us from taking the heads off.

9834.

\* NOTE (on revision):—It should be explained that this is arrived at only by making the compo. with a minimum amount of water, which would increase to strength of the Monier compo. to more than double the strength of ordinary compo. (crushing strength), and the iron rods would bear all the tensile stress, which is only one-seventh to one-tenth the crushing stress.

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- G. Dawson. 9834. It was when his back was turned that this sort of thing went on? Yes.  
 9835. Who was overlooking you on behalf of the contractors? Banded.  
 20 July, 1896. 9836. Did he give you instructions about this? Yes. It was done on his order.  
 9837. It was no one else's order? No.  
 9838. *His Honor.*] I suppose you could not distinguish the cement when it came out of the cask? No.  
 All that we could tell it by was that the casks were not so tightly filled.  
 9839. Did you notice many casks which were not so tightly filled as the casks which came out from Europe? Yes, a great many.  
 9840. How many? If I said forty or fifty I daresay I should be within bounds.  
 9841. Could you be pretty certain, on opening a cask, as to whether it was a cask which had originally come out as it then was, or whether it had been refilled? Yes, if you took particular notice.  
 9842. Did you take particular notice? Sometimes we could not help noticing.  
 9843. Could you tell in any way by the nails? Yes.  
 9844. Were the same kind of nails used in the refilled casks as in the original casks? Wire nails were used in the refilled casks and square section nails were used in the original casks.  
 9845. Could you not also tell by the state of the hoops? Yes; the hoops would not be very sound. Of course they had to be put over the top again when the casks were refilled.  
 9846. Were the hoops generally put back again? Yes. We were told to put all we could inside the casks when we sent them over to be refilled.  
 9847. When the casks were refilled could you not see the old nail holes? Yes; and the heads were all broken as well.  
 9848. So that you could be quite sure as to the casks? Yes.

William Gilliver recalled and further examined:—

- W. Gilliver. 9849. *Mr. Parkes.*] You gave us evidence when you were last here as to the length of time you had been  
 20 July, 1896. contracting in New South Wales? Yes.  
 9850. You have had to mix up a good quantity of concrete in your time. The Government, in their specifications, provide for a 7, 3, and 2, special concrete, a 4, 2, and 1, bluestone concrete, and a 5, 2, and 1, sandstone concrete? Yes, that is the specification which is generally used.  
 9851. In the case of the 4, 2, and 1, bluestone concrete, how much cement does it take to make a yard? We put in 16 feet of bluestone, 8 feet of sand, and a cask of cement, or 4 cubic feet; that would be the gauge.  
 9852. What will that run out? Nineteen and a half cubic feet.  
 9853. The proportion of cement would be about a cask and what? The difference between 19½ cubic feet and 27 cubic feet, whatever that would take. I have tested it both at Rookwood and Parramatta, using the Emu Plains sand.  
 9854. What about the 5, 2, and 1 concrete—what will that run out? Twenty-three and a half cubic feet.  
 9855. And the 7, 3, and 2 special concrete? I could not say. I have done so little of that.  
 9856. That is of a special nature, and it would take more cement than the others? Yes; it is used round manhole covers.  
 9857. But the proportions of 3 of sand and 2 of cement would make it contain more cement than the other concretes? Yes. I do not think I have done more than 20 cubic yards of it during the whole time I have been contracting.  
 9858. The specification of the Government is a very severe one. You are supposed to put the invert of the sewer in in 9-inch layers; and to grout up with an inch of cement on each layer? Yes, but we do not do that. We put a cradle in and fill in either side; 3-in. lagging is used.  
 9859. You do not carry out the specification as to the layers;—do you know if it has ever been carried out by any contractors? It is not usually carried out. We fill in the two sides of the cradle; there may be a 6-inch layer or a foot layer.  
 9860. But in the morning, or when you commence work after any stoppage, do you put a layer of cement on—that is, a flushing or grouting? It is cement-washed. It would be stepped or brought up to a head before knocking off. But if it had been left any length of time it would be flushed.  
 9861. Your calculations for the cement required do not allow for an inch of grouting? No.  
 9862. You have not taken that into account at all? No; that would come out of a separate cask, but very little of that is done.  
 9863. You have given the basis on which you proceed in making any estimate for quantities of cement? Yes.  
 9864. Did you ever have an inspector named Reid supervising your work? Yes; he supervised the Coogee culvert contract I had, and he was relieving inspector at Parramatta on two or three occasions.  
 9865. Was he a quarrelsome man? No; he was not at all quarrelsome, but he was very particular.  
 9866. You had no reason to ask for his withdrawal on any occasion in consequence of his quarrelling with your men? No. I would as soon work under Reid as any inspector I have ever worked under.  
 9867. Is he strict in carrying out his duties? He is. There can be no two opinions about that. He appears to me to be a conscientious, fair man. I do not think he would put a contractor to unnecessary expense. He never did so in our case.  
 9868. Will you read the letter I hand you? Yes. It is as follows:—"I certify that Robert G. Reid was engaged on the Sydney and suburban sewerage works as second-class inspector for about 18 months, and that his services were dispensed with in September last, on account of slackness of work. He is an industrious, sober, and reliable, man, and quite suitable for any position similar to the one he has filled in this branch.—J. DAVIS, Supervising Engineer." There are two minutes appended to that. One, by Mr. Hickson, is as follows:—"From personal observation, I can endorse the above." Then Mr. Davis has also written, on 20th January of present year:—"Inspector Reid has been employed on sewerage works since the foregoing date on two occasions, extending over a period of upwards of two years."  
 9869. You have always found him to be an upright man, keeping you up to your duties? Yes.  
 9870. But never a man who bounced anyone unnecessarily? No; I have found him, as I say, a fair man. He is particular and exacting. There is no doubt about that—more so than some of the other inspectors are.



9871. *Mr. Davis.*] As to the grouting, has any specification which you have had in connection with sewerage works provided for an inch of grouting? I cannot say what has been specified. We have always grouted when we have stopped work and when it has been left for any time. W. Gilliver.  
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9872. What do you understand by the term, an inch—do you take it to be an inch thick? No; I suppose it would not be an inch thick; but the work is always grouted when it is stepped—that is, going from the old work to the new.
9873. But what do you mean by an inch of grouting? I did not say that I had done an inch.
9874. Have you ever known it to be done to the extent of an inch in thickness? No.
9875. Would it not be absurd to talk of an inch of grouting? The work is flushed over with pretty good stuff.
9876. *His Honor.*] You grout the work to cause a bond? Yes.
9877. *Mr. Davis.*] When a piece of work is finished overnight, would there be any large holes left in the concrete;—is it not the practice to finish the concrete with a flushed surface? Yes; but in cases where it is not flush we always grout it up. As a rule, it is worked with spades up to a piece of timber to get a smooth face.
9878. That is obtained outside and inside? Yes.
9879. As to the quantity of cement in a cask—what would you say a cask of cement would contain?  $4\frac{1}{2}$  cubic feet. I have measured it repeatedly.
9880. If it were taken out of the cask, it would make in the gauge box  $4\frac{1}{2}$  cubic feet, you say? Yes.
9881. And the concrete, which was to be in the proportion of 1 of cement to 2 of sand and 5 of sandstone, would contain more sand than 8 cubic feet and more stone than 20 cubic feet—is that so or not? I am not sure that I understand your question. The figures I have given you are from my own practical experience. I know that they are correct.
9882. Have you done any tunnel packing? I have been concreting for about twenty years.
9883. Have you done any sewerage tunnel packing with sandstone concrete? Yes, over brickwork.
9884. On those occasions, was it not a fact that it was to your interest, and certainly not injurious to the work, to measure more concrete than a cask of cement would make up? The work would be packed with poor concrete, would it not?
9885. What gauge-box did you use for mixing the concrete in your tunnel packing? I could not tell you.
9886. Were the gauge-boxes for 20 feet of stone and 8 feet of sand? I could not tell you.
9887. Supposing a smaller gauge-box than 20 feet of stone and 8 feet of sand were used, would it not be necessary to take the cement out of a cask? Yes, undoubtedly it would be, if you were using 5, 2, and 1; but the concrete used, I understood, was poor concrete. Why I am so certain of the point is that one of your inspectors and myself tried the quantities I have given upon the Parramatta and Rookwood contracts.
9888. Would it be necessary to take cement out of the casks if less than a 20-foot gauge-box were used? Yes.
9889. Would not the cement have to be gauged in that case? Yes; a tunnel is lined in 3-foot lengths, and you could not mix 20 cubic feet to cover over a space of 3 inches.
9890. But cement, when mixed with concrete in that way, would have to be taken out of the cask? Yes.
9891. In all such cases it would make  $4\frac{1}{2}$  cubic feet? We have carried out a contract at the rate of  $4\frac{1}{2}$  cubic feet. That is where we were at cross purposes with the departmental officers. We measured it, and put in as much stone as would be the proper proportion with  $4\frac{1}{2}$  cubic feet.
9892. As to the sand, you say that the experiment you made was made with Emu Plains sand? Yes.
9893. Have you made any experiments with crushed sandstone? Yes; and we got half a foot less.
9894. Have you made an experiment with drift sand? No; I have never used any of that.
9895. You know that until recently drift sand was used exclusively in sewerage work? Not since I have been contracting.
9896. You do not know it of your own knowledge? No.
9897. When you said just now that a cask of cement would make 19½ feet of bluestone concrete and 23½ feet of sandstone concrete, you were giving the results of your own experiments? Yes.
9898. You put the mixture back into the gauge box? Yes.
9899. You were not present when a similar experiment was made at Plattsburg? No.
9900. Although your partner may have been present? I know of it only from hearsay. Either Mr. Curtis or Mr. Stack could give you the information.
9901. As a contractor, with a good deal of experience, do you think it would be fair to take a single experiment as an absolute criterion of what a cask of cement would make in the work? My experiment agreed with the way in which we were using the material as it went down into the tunnel.
9902. Do you think a cask of cement would make the same quantity of concrete that you made when putting the mixture into the gauge box? I suppose it would be the same thing. It was simply knocked off the shovel into the box, and then back again.
9903. Do you think the gauging of concrete of the same mixture would vary at all? It might if they used gravel with the sandstone as they did at Plattsburg.
9904. Would not the fineness or otherwise of the stone and sand have a great deal to do with the bulk which could be made by the gauging of bluestone and sandstone concrete? Undoubtedly; we have been getting our sandstone broken smaller, and we get a better result.
9905. You might make a dozen experiments and you would not get the same result supposing you used a different mesh of stone and a different fineness of sand with the same quantity of cement? It would vary more or less.
9906. *His Honor.*] It depends upon how the stone is broken, and the shape into which it is broken? Yes.
9907. *Mr. Gummow.*] Is it not the case that every man cannot necessarily agree with another man—for instance, do you agree with every man with whom you come into contact? No; I have often had a hiding and often given one.
9908. Could the man to whom you gave a hiding, for instance, necessarily agree with another individual? Not necessarily, I suppose.
9909. So that, although you could agree with Inspector Reid, it is possible that Inspector Reid's temperament might not agree with that of some other persons? That is quite possible. I have spoken of Reid as I found him.

- W. Gilliver. 9910. You do not infer that, because Reid does not agree with some one else, that that other person is necessarily in the wrong? From my experience of Reid I should say he was a man who would be satisfied with a fair thing.
- 20 July, 1896. 9911. But if he disagrees with anyone else, does it necessarily follow that Reid is right, and that the other person is wrong? I never found Reid unreasonable.
9912. You say that bluestone concrete of the gauging you have named would make  $19\frac{1}{2}$  cubic feet, and that the sandstone concrete would make  $23\frac{1}{2}$  cubic feet? Yes.
9913. If other witnesses say they would go only 16 feet and 20 feet, are they incorrect? Not necessarily. A good deal would depend upon how the stone was broken and forked.
9914. At that rate you cannot tell to within  $3\frac{1}{2}$  cubic feet whether you or they are right? We simply forked the stuff out of the heap, and put the sand in it; but I am quite satisfied with the results.
9915. If another witness says that the quantities you gave would make 16 and 20 cubic feet, are they correct or not? I do not see how I could answer that question.
9916. *Mr. Parkes.*] Are you using for your concrete sand crushed from stone which comes out of the tunnelling? It comes from a hill alongside.
9917. Carter & Co. are using sand from stone which comes out of their tunnelling, are they not? I could not say.
9918. But it comes from the neighbourhood, does it not;—it is all the same class of stone? Yes. I think the man who supplies them is working within a few yards of the place where we are working. We are practically working at the one place.
9919. *Mr. Gummow.*] Do you know where the sand we are using comes from;—are you sure that we are not using North Sydney sand in our aqueducts? I could not say. M<sup>r</sup> Millan said he was supplying you with sand, and he said that it had been already tested, that he could supply us with the same sand, and that there would be no bother about it.
9920. But does the sand we are using come out of the tunnelling? I do not know where it comes from. I know that we are getting better stone out of our tunnelling now than is being used for the sandstone concrete; it is very much harder.

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Peter Parfitt sworn and examined:—

- P. Parfitt. 9921. *Mr. Parkes.*] On July 6th of this year, Mr. Rigg, your assistant manager, was a witness before the Commission, and he said that he did not know your business or connection with certain questions. Other-wise you would not have been asked to attend to-day. Two days before Mr. Rigg came here, was not Mr. Hickson in your office? I could not answer that question.
- 20 July, 1896. 9922. Did he not see you? No; I never saw him in my life to my knowledge.
9923. Mr. Hickson has said before this Commission in answer to questions that he had a communication from the manager or sub-manager of your Bank, in which he said that, if any question arose in connection with the sureties of Mr. Forrest and Mr. Gillan, if the matter were referred to him he would furnish all particulars. Did you send that? It is quite possible that such a communication may have been sent from the office. Personally I had nothing to do with it.
9924. And you say you have never seen Mr. Hickson in your life? I have not to my knowledge.
9925. Mr. Hickson in his evidence said that the manager or sub-manager of your Bank had said that he would give any information as to the stability of the firm, and he thought that Mr. Gillan's name was specially mentioned. Mr. Rigg in his evidence said that no inquiries had been made of him. Did you have any conversation with Mr. Rigg about this matter at all? No. The names you are using now are hardly familiar to me.
9926. You never had any conversation at all with your sub-manager as to the names as sureties of Mr. Forrest and Mr. Gillan, which were given to the Works Department? No.
9927. On no occasion? No.
9928. You never heard from any of your officers whether Mr. Hickson was on July 4th at the Bank? No.
9929. Could you furnish the Commission with the credit limit given to the firm of Carter, Gummow, & Co.? We have no fixed limit at all.
9930. Have you not a book in which you minute up the credit limits which you give to your clients? When we absolutely arrange matters with them; but as far as I can discover there is no record of any such arrangement with these gentlemen. Their account used to swing up to about £3,000.
9931. Was that their limit? We expected an explanation if they went any further than that. As far as I have been able to see upon the records which I looked up before coming here they have not gone beyond that.
9932. Have you, as manager of the Bank, looked into the account of the firm? Not specifically. Since I took charge here the account has been working towards reduction.

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Walter Alexander Smith recalled and further examined:—

- W. A. Smith. 9933. Mr. Smith, you have read the evidence of Mr. Bryant and Mr. Symonds given before the Commission on 10th instant? Yes.
- 20 July, 1896. 9934. And you have read more particularly the statement put in by Mr. Bryant as the result of his examination of the vouchers relating to the cost of the Monier culvert at Strathfield? Yes.
9935. Is that statement taken from the vouchers a fair statement? No, it certainly is not.
9936. Why do you say it is not a fair statement? Because it includes many items which, although they may be chargeable to the Main Western Road, are not chargeable to the Monier culvert. They are correctly paid from the Main Western Road Vote, but they are not fairly chargeable against the Monier culvert.
9937. Have you gone through very carefully all the vouchers referred to in Bryant's statement? Yes.
- 9938.

9938. And you have prepared a statement showing in detail in what respects you differ from that statement? Yes. It is as follows:—

W. A. Smith.  
20 July, 1896.

## Monier Culvert, Strathfield.

|   | £   | s. | d. | £   | s. | d. |
|---|-----|----|----|-----|----|----|
| Completion of culvert and <i>all works</i> incidental thereto, as per vouchers collected by Messrs. Symonds and Bryant.....     | 225 | 0  | 0  | 225 | 0  | 0  |
| Completion of culvert and all works incidental thereto, as per vouchers collected by Messrs. Symonds and Bryant.....            | 225 | 0  | 0  |     |    |    |
| No. of Vouchers. <i>Less</i> amounts not chargeable to the work, as follows:—   |     |    |    |     |    |    |
| Pt. 389 14 casks of cement not used in work .....   | £9  | 9  | 0  |     |    |    |
| 368 Dressed stone not used in culvert (probably for kerbing and guttering) .....  | 6   | 3  | 0  |     |    |    |
| Pt. 275 & 354 43 days' pay to Bramston at 12s. while not actually engaged on the work of this particular culvert .....          | 25  | 16 | 0  |     |    |    |
| 250 Lanterns for general use on the M.W. Rd. and elsewhere .....  | 1   | 8  | 2  |     |    |    |
| 414 Wages on the M.W. Rd. after the culvert was constructed and opened for traffic, <i>i.e.</i> , subsequent to 2nd August..... | 10  | 0  | 11 |     |    |    |
| 201 Bolts not used in this work .....   | 0   | 10 | 5  |     |    |    |
| 208 & 191 Timber sent to Iron Cove, and not used in this work.....  | 8   | 17 | 10 |     |    |    |
|   | £62 | 5  | 6  | 62  | 5  | 6  |
|   |     |    |    | 162 | 14 | 6  |

Completion of concrete structure and connections only, as per attached statement:—

| SUMMARY.                    |  | £  | s. | d.       |
|-----------------------------|--|----|----|----------|
| Materials and carting ..... |  | 50 | 19 | 6        |
| Wages .....                 |  | 53 | 11 | 3        |
| Supervision .....           |  | 5  | 8  | 0        |
|                             |  |    |    | 109 18 9 |

NOTE.—This is exclusive of office supervision.

Completion of Monier arch culvert, including three pipe connections and four gully shafts, but *exclusive of the lowering of main, removal of scour-pipe, &c., removal of old structure, remaking of road, cutting outlet drain, laying kerbing and guttering, and relaying asphalt footpath*, as per following vouchers:—

| WAGES.   |  | £  | s. | d. | £   | s. | d. |
|--|--|----|----|----|-----|----|----|
| Total wages paid, as included in vouchers collected by Messrs. Symonds and Bryant... ..  |  |    |    |    | 114 | 14 | 2  |
| <i>Less</i> amounts not chargeable under this heading—   |  |    |    |    |     |    |    |
| Pt. 189 P. Brady, for carting on road (Isles did all carting for culvert) .....  |  | 0  | 15 | 0  |     |    |    |
| Pt. 190 M. Ahern, wages to 31/5/94—12 days at 8s. is chargeable; balance of £5 6s. 6d. not chargeable .....  |  | 5  | 6  | 6  |     |    |    |
| Pt. 224 Wages to 9/6/96 include removing half of old structure, cutting outlet drain and trench for first half of culvert—five men—four days, and three men—two days, at 7s. 8d.....   |  | 9  | 2  | 0  |     |    |    |
| Pt. 270 Wages to 23/6/96 include making up roadway over first half of arch—two men half-day removing second half of old structure, and cutting trench for remainder of new structure—five men—four days, at 7s.....                      |  | 7  | 7  | 0  |     |    |    |
| Pt. 363 Wages to 28th July include making up second half of roadway—two men half day, and redressing and relaying kerbing and guttering—three men—six days at 7s... ..   |  | 6  | 13 | 0  |     |    |    |
| 414 Wages to 16/8/96, after the culvert was completed and opened for traffic, <i>i.e.</i> , subsequent to 2nd August .....   |  | 23 | 0  | 11 |     |    |    |
| 220 Wages to 7th April. Up to this date no work in connection with the culvert had been undertaken. The amount (£2 2s.) is therefore deducted .....  |  | 2  | 2  | 0  |     |    |    |
| Included in the foregoing wages Davidson is credited with working 49½ days, whereas he only worked 30 days, being sent to gasworks bridge, while the remainder of the men stayed at the culvert; £6 16s. 6d. is therefore deducted ..... |  | 6  | 16 | 6  | 61  | 2  | 11 |
|  |  |    |    |    | £53 | 11 | 3  |

Completion of Monier arch culvert, including three pipe connections and four gully shafts, but *exclusive of lowering of mains, removal of scour-pipe, &c., removal of old structure, remaking of road, cutting outlet drain, laying kerbing and guttering, asphalt footpath, &c.*

| MATERIALS AND CARTING.  |  | £ | s. | d. | £   | s. | d. |
|---|--|---|----|----|-----|----|----|
| Total amount paid, as per vouchers collected by Messrs. Symond and Bryant .....     |  |   |    |    | 92  | 3  | 2  |
| <i>Less</i> amounts not chargeable to erection of culvert—                          |  |   |    |    |     |    |    |
| 201 Bolts not used in structure .....   |  | 0 | 10 | 5  |     |    |    |
| 250 Lanterns for general use on the M. W. Road and elsewhere .....                  |  | 1 | 8  | 2  |     |    |    |
| Pt. 327 Blacksmith (11/9)—8/3 of this amount is for sharpening road picks, &c. .... |  | 0 | 8  | 3  |     |    |    |
| Pt. 389 Fourteen casks of cement not used in the work, at 13/6 .....                |  | 9 | 9  | 0  |     |    |    |
| 467 Water and Sewerage Board charges for lowering mains, &c. ....                   |  | 3 | 15 | 3  |     |    |    |
| 468 Do do do .....  |  | 6 | 3  | 1  |     |    |    |
| 469 Do do do .....  |  | 2 | 7  | 5  |     |    |    |
| 208 & 191 Timber sent to Iron Cove store, and not used in this work .....           |  | 8 | 17 | 10 |     |    |    |
| Pt. 234 Deduct one-third of this, which could not have been used in culvert.....    |  | 2 | 1  | 3  |     |    |    |
| 368 Dressed stone, not used in culvert—probably in kerbing and guttering.....       |  | 6 | 3  | 0  |     |    |    |
|   |  |   |    |    | 41  | 3  | 8  |
|   |  |   |    |    | £50 | 19 | 6  |

## SUPERVISION OF INSPECTOR.

|  |    |    |   |         |
|--|----|----|---|---------|
| Total amount paid, as per vouchers collected by Messrs. Symond and Bryant.....     |    | 31 | 4 | 0       |
| Deduct 43 days at 12/- a day while Bramston was not employed on this culvert ..... | 25 | 16 | 0 | 25 16 0 |
|  |    | £5 | 8 | 0       |

W. A. Smith.  
20 July, 1896.

9939. So that from a further investigation of the vouchers it would appear that the actual cost of this Monier culvert alone instead of being £114 odd is really £109 18s. 9d? That is what I make out from the vouchers. When I was giving my evidence, I stated that I went into the matter most carefully at the completion of the work, and that the figures came to £114. I probably included office supervision under that heading. I do not at this moment recollect how I made it up. It was made up from the Inspector's time-book, and from the material we had ordered at the time.
9940. Did Bryant have the supervision of the work? He had nothing to do with it—he was a clerk in the office.
9941. Did Mr. Symonds supervise the work? No; he simply paid the men.
9942. It was you who supervised the work? Yes.
9943. And you had a special reason for supervising it yourself? Yes; it was a new thing. It was the first culvert of the kind which had been erected, and I supervised it myself.
9944. You are quite sure that the quantity of cement shown in Mr. Bryant's statement could not have been used in the construction of the arch? No. There were 24 yards of concrete and 5·75 of compo., so that it would only take twenty-four casks of cement for the concrete and, say, ten for the compo.—that would be only thirty-four, whereas I am credited with using forty-nine.
9945. And as to the timber? As to the timber, the platform for the concrete was composed of old boards from the store which were splashed all over with tar. I remember that while the work was going on I noticed that. So also with regard to the planks used in putting up the wall. The only new timber provided was for the centering and the two or three little beams which were used in connection with the work. I asked Mr. Boys, of Parramatta, to measure up the centering used, and he makes 194 superficial feet. The voucher, according to Bryant's statement, gives me credit for, I think, £1 7s. for timber; that amount would supply, roughly, 270 superficial feet. These two items of £4 13s. and £4 4s. 10d., I have deducted, because the timber could not possibly have gone into this work.
9946. As to the wages of Mr. Bramston for nine days? It would not be more than that.
9947. What was he doing besides this culvert at the time? He was an inspector for the whole division. He had usually a great number of small works going on. He would probably have works going on in two or three districts at one and the same time, and he would go from one work to the other.
9948. And you are perfectly satisfied as to the correctness of the other items you have given? Yes; I am quite satisfied. I have gone carefully into them.
9949. What do you say with regard to the statement as to your using part of the Callan Park vote? I do not see how I could have used any part of it. The vouchers shown by me include everything in connection with the culvert, and they were all paid from the Main Western Road vote. I have no recollection of anything being paid for out of the Callan Park vote.
9950. That was a separate vote by Parliament for this particular work at Callan Park? Yes; £1000 was granted.
9951. As to works upon the Main Western Road, what is the course as to that one vote for the whole of the road? There is an annual maintenance vote for the Main Western Road, and all small works, such as this culvert, would be paid from the annual vote. On this occasion the Commissioner gave his approval for the construction of the culvert from the annual vote.
9952. So that there would not be any papers recommending a particular sum for the culvert? No. There was only one paper, as far as I can recollect, in connection with this culvert. Mr. Hickson made some minute in reference to it, and asked me to see him. Then, after I had seen him, he wrote "Approved" upon the paper. I remember that.
9953. Have you seen the paper lately? I saw it before it came down to this room.
9954. This paper is still to be seen with the office papers? Yes; I saw it when the papers came down here. The paper was with the Ormond-street culvert papers.
9955. As a matter of fact the Commissioner of Roads has power, under an Act, to appropriate a portion of the Main Western Road vote for these small works? Yes.
9956. So that only his authority would be necessary in dealing with a small matter of this kind? That is all.
9957. As to the Callan Park grant, the whole of it was not used for the purpose for which it was made? No.
9958. I believe there was a balance of some £227? Yes; that was written off because it was not required. Dr. Manning was satisfied with all that had been done, and there was no occasion to spend the balance.
9959. Bryant says that you told him to charge against the Callan Park account wages which were actually earned, and known to have been earned, upon the Strathfield culvert? That is absolutely untrue.
9960. As far as you know, you never authorised the debiting against one account of expenses incurred in connection with another? No; excepting in very small matters of wages and material, or for the replenishing of stores, and those charges would about balance up in the year.
9961. Did Mr. Symonds ever object, as he said in his evidence, to the manner in which payments were being made? I have no recollection of it. I see from his evidence that he admits that he may not have spoken to me, and that he may have spoken to Bryant.
9962. You do not recollect his speaking to you? No; not at all.
9963. Bryant said that he was sent for by the Department to adjust your accounts after he had left;—what was it that happened? The facts are these. When my office as divisional engineer was abolished, and the books were made up, it was found that the deposit account was incorrect to the extent of £7 12s.; that amount could not be traced. Finally, a receipt was found in the office signed by Bryant, showing that he had received the money, and had apparently not paid it into my account. There was that amount of shortage, and I wrote to Bryant because I thought it right to give him a chance of explaining the matter, if a mistake had been made. He at once came in and said he remembered paying the money into the bank. After making inquiries he found that he had done so, and that the bank had made an error, and had put the amount to the credit of a Mr. W. Smith, at Hay.
9964. That was the whole cause of the trouble? Yes.
9965. And that is the whole matter that Bryant had to adjust? Yes.
9966. Do you remember that some cement was bought from Carter, Gummow, & Co.? Yes; that was for the Callan Park work.

9967. On whose authority was it done? Some cement was tested and condemned, and the whole work was stopped. I was anxious to get on with the construction, and I asked permission to obtain some cement elsewhere. That permission was given by Mr. Scarr, acting for Mr. Hickson. On going out of the office I met Mr. Carter, and I asked him whether he could oblige me with twenty-five casks of cement. He said, "Certainly," and sent the cement down to the work. W. A. Smith.  
20 July, 1896.
9968. As to the size of this culvert at Strathfield, you saw what Mr. Symonds said about it? From what I remember, the area of the culvert is nearly twice as big as it need be. Culverts are always built in that way near towns or very thickly populated places if the catchment area is unimproved, because the area eventually becomes covered with houses and footpaths and macadamised roads, and the water then flows off more quickly, and a larger culvert would be required to carry it off. In the first place, you would probably allow for only half an inch an hour flowing off, whereas if the whole area were covered with houses the water might flow off at the rate of 2 inches an hour.
9969. *Mr. Gummow.*] Could you tell me the cost per cubic yard of the centering for the Monier arch? It runs out at about £1 per cubic yard.
9970. *Mr. Parkes.*] Have you books showing the complete expenditure upon the culvert; for instance, take the case of Mr. Bramston's wages—you say that he had many works to look after;—can you show us in any book where his time has been entered? No, I do not think I can.
9971. What works had he to inspect during the time this culvert was going on, and how would his time be divided? I do not remember. I know that he had a great many works to look after within a month or two of that time.
9972. You have no book in which a record of his time for each week would be kept? No.
9973. And how do you know he was occupied elsewhere? Well, I know what time it would be necessary for him to put in in connection with the culvert. I know from the evidence of men to whom I have spoken, who were there at the time, that Mr. Bramston could not have been at this culvert for the period given.
9974. But you have no book in which his time is entered? No.

John Carter recalled and further examined:—

9975. You have handed to the Commission a paper showing the particulars of the landed property held by Carter, Gummow, & Co.;—besides the buildings upon the Lodge estate, have any of the other allotments buildings upon them? One of them. There is a detached cottage on the allotment on the Illawarra Road, Marrickville. [*Vide Appendix No. 37.*] J. Carter.  
20 July, 1896.
9976. Have any of the other allotments buildings on them? The property in Hill-street has a stable upon it.
9977. Otherwise the land is vacant? Yes.
9978. On 14th May, 1890, you transferred your account from the Commercial Bank to the Bank of New Zealand? Yes.
9979. And you paid to the Commercial Bank to square accounts £211 12s. 11d.? Yes.
9980. At the time you had the transaction with Mr. Weedon, and when Mr. Weedon paid a certain amount of money into the firm's account, was not the bank asking you to reduce your overdraft? It is as well to be particular in these matters. In the first place, Mr. Weedon did not pay the amount in; and, in the next place, the bank has never asked me to reduce an overdraft since I have been doing business with them.
9981. But at this time you were wanting money? Not in the least.
9982. Then why, upon 8th March, 1895, did you increase your mortgage on the Lodge property—£3,500—by £1,000? That was purely a matter of business.
9983. You put the £1,000 into your business, did you not? Yes.
9984. You wanted the money for the business then? Yes; I would borrow £10,000 for the business to-morrow if I could get it.
9985. Then you need it for the business? I should do so from a business point of view; not that it is absolutely needed. We never needed money in that way.
9986. Did you lodge any further security with Sir William Manning for this further sum of money? Not anything. He was only too glad to give it at the price.
9987. The list of properties you have handed in includes some of your own private property? Yes.
9988. Take the detached cottage in the Illawarra Road—is that your private property? It is the firm's property, but it is in my name.
9989. What is the value of it? £775. That is the Richardson and Wrench valuation.
9990. That is not the property which belongs to James Gillan? A part of it.
9991. It is not his cottage property which has been previously referred to? No; but as a member of the firm he has an interest in it. It belongs to the firm, although it is in my name.
9992. Then there is the vacant land in Alfred-street, North Sydney? That is in my name, and belongs to Carter, Forrest, and Snodgrass.
9993. What is the value of it? About £400, I suppose.
9994. Then as to vacant land in Alfred-street? That is mine.
9995. As to the stables and land in Hill-street, North Sydney? That is my own property.
9996. And the frontage of 30 feet, with a depth of 71 feet, or thereabouts, being part of lot 12, section 2, town of St. Leonards, parish of Willoughby? That is also my private property.
9997. What is the present value of the Lodge estate;—what is the Richardson and Wrench valuation? £8,500, I think. It was good enough for Sir William Manning to advance £4,500 upon it. I find I made a mistake in giving my evidence the other day about this property. I had an idea that it was in my name, but my solicitor tells me that it is in the names of Carter, Forrest, and Snodgrass, each having a third share.
9998. Mr. Gillan has no interest in it? No.
9999. Is the land in Miller-street included in the Lodge property? No; it is not.
10000. What is that worth? About £400.
10001. Had Mr. Weedon any hold upon the Lodge property? No. His allotments are the Miller-street land, the Illawarra Road land, and my own private property in Alfred-street and Miller-street—four separate blocks. 10002.

- J. Carter. 10002. *His Honor.*] Those were given to him as security? Yes.  
 10003. *Mr. Parkes.*] A cheque of yours of 1st September, 1894, was drawn in favour of a man named Andrews;—is he an inspector? No.  
 10004. What is he? A blacksmith, I think. You will find other cheques drawn in his favour.  
 10005. Then there was a cheque paid to a Mr. Bellingham;—who is that? Cook and Webb's foreman. He was employed by us to fit up a machine at Stuart Town.  
 10006. On 18th May, 1894, there is a cheque for two guineas payable to J. Corp;—was he an inspector? Yes.  
 10007. Then there is a cheque payable to a man named Horney;—is he an inspector? No.  
 10008. And another to a Mr. Board;—is he an inspector? No. Speaking from memory, I think he is a grazier at North Shore.  
 10009. Was not Chiene's statement that Corp received a regular fee from you true? No; it is not true. I said before, and I say it again, that I assisted him repeatedly. As to his receiving a regular fee, that was quite out of the question. I did not see him at all regularly.  
 10010. This was a cheque towards his assistance? I should think, judging from the date, that it was probably a subscription towards his funeral expenses. I remember that he died about a couple of years ago, and the cheque is dated May, 1894. I think Board was in business at North Shore. I gave him money on account of a friend of mine, who is now in New York.  
 10011. Had you any security from O'Hanlon and Rudolph for the money you lent to them? Yes. In the case of O'Hanlon, I had a mortgage over the cottage when it was in a fit state to mortgage. I am referring to the house which he built upon the land. I assisted him to buy at Drummoyne.  
 10012. Do you know the street in which it was situated? No.  
 10013. Have you the title deeds? The transaction was over years ago. The money was all paid back in one cheque through Johnson, Minter, and Simpson.  
 10014. Does that appear in your accounts? Yes.  
 10015. What happened in Rudolph's case? He gave me a written acknowledgment of the debt, signed by himself and his wife, and, it being a transaction between friends, as he and I were, that was quite sufficient for me.  
 10016. No promissory note was given? No.  
 10017. *Mr. Gummow.*] As to this extra £1,000 on the Lodge property, you say that Sir William Manning was glad to give it? Yes.  
 10018. Did he lower the interest on the money already advanced? Yes, a  $\frac{1}{2}$  per cent.  
 10019. As well as giving you the extra £1,000? Yes.  
 10020. Therefore, it was good business on your part? I thought so.  
 10021. As to wanting money for your business, can you remember any transaction with the head manager of your bank in Melbourne about two years ago? Yes; I remember meeting Mr. Andrews there, the general manager of the Bank of New Zealand in Australasia at that time. I had overdrawn £10,000 or £12,000. Mr. Parfitt did not recollect that transaction this morning. No security was lodged with the bank for that overdraft, and in the face of it, Mr. Andrews told me that I could draw £15,000 upon my Melbourne account for the works we had in hand there, if I wanted it.  
 10022. Without any security whatever? Yes, without any security.  
 10023. Was not that a time of financial crisis? Yes, the banks were all breaking.  
 10024. It was a time when the banks particularly wanted their money;—it was not boom time, when they had any amount to spare? It certainly was not.  
 10025. As to the cheques to Andrews, do you remember what they were paid for? It was for mechanical work, blacksmithing, and so on in connection with a patent brake we were trying to introduce.  
 10026. As to Mr. Weedon's transaction; when did you give him those properties as mortgages—was it this year or last year? Last year.  
 10027. You are absolutely certain of that? Yes.  
 10028. It was about the date you received his cheque? Yes.  
 10029. You gave him an equitable mortgage at the same time? Yes.

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WEDNESDAY, 22 JULY, 1896.

James Gregg sworn and examined:—

- J. Gregg. 10030. *Mr. Parkes.*] What is your position? I am managing director for Richardson and Wrench (Limited), auctioneers and land valuers.  
 22 July, 1896. 10031. You have valued certain properties of Carter & Co. and John Carter? Yes.  
 10032. Did you value the property known as the Lodge property at North Shore? No. It was valued in 1893, and it was revalued in 1895.  
 10033. What was the amount of the 1895 valuation? £7,500.  
 10034. Can you give from memory a description of the property as it stood in 1895? Yes. There were 330 feet to the east side of Miller-street, and 263 feet to the south side of Maclaren-street. There is an old residence upon the property, and a new stone house where Dr. Kyngdon is now living.  
 10035. What would be the value of the property at the present day? It would be a little weaker than in 1895, no doubt.  
 10036. Had you the deeds of the property? No.  
 10037. You have seen the deeds? No.  
 10038. Whose property did you understand it to be? The valuation was made on account of Carter & Co.  
 10039. There is a vacant allotment in Miller-street belonging to Mr. Carter;—that was not included in the Lodge property? No.  
 10040. What is your valuation of that vacant allotment? £337 10s. was the valuation I made yesterday of the block of land having 75 feet frontage to the west side of Miller-street, between Falcon and Ernest Streets, with a depth of 132 feet, being portion of allotments 11 and 12 of section 18, township of St. Leonards.  
 10041. You also valued a vacant allotment of land, being portion of allotment 12 of section 2, town of St. Leonards, having 30 feet frontage to Hill-street, between Miller and Elizabeth Streets, and a depth of 71 feet?

- feet? Yes. There are some old sheds on it, which are occupied as stables by cabmen. I estimate the present market value of the allotment to be £170. J. Gregg.  
22 July, 1896.
10042. You also valued a block of land having 99 feet frontage to the east side of Alfred-street, between Falcon and Ernest Streets, with a depth of 132 feet, and with a lane entrance at the rear side, being portion of lot 16, section 24, of town of St. Leonards? Yes. I estimate the present market value to be £594.
10043. You also valued an allotment of land having 35 feet 8 inches frontage to the west side of Illawarra Road, a few yards south of Woodlands-street, with a depth of 128½ feet, and with an entrance from Woodlands-street? Yes. On that property is erected a detached cottage named "Dimora." It is of brick cemented on a brick foundation, slate and iron roof, bay-window, and verandah in front, also verandah at rear; and containing hall, five rooms, bathroom, pantry, kitchen, and wash-shed. There is a small shed in the yard. I was unable to go into the house, the tenant being out yesterday when I was there; but I know the cottage very well, and I estimate its present market value to be £550.
10044. The total of the properties you valued would be £1,651 10s.? Yes.
10045. That is the present-day value? Yes.
10046. You consider it a full and liberal value? Yes, I think I have given full value.
10047. Do you know a property named "Blink Bonnie," in Fairfowl-street, Dulwich Hill? I know the street, but I do not know the cottage.
10048. What would be the value of the properties of the firm and of Mr. John Carter, including the Lodge property? The Lodge property would have a value of, (say) £7,500. The properties I valued yesterday would have a value of £1,651 10s. That would give a total of £9,151 10s.
10049. *Mr. Carter.*] With reference to the property in the Illawarra Road, do you remember that we purchased it on your valuation two years ago? Yes.
10050. Do you remember what your valuation then was? £750.
10051. In 1893 you valued the property of Carter & Co., known as the Lodge property, at £8,500? Yes.
10052. And you valued the land in Alfred-street at £800? Yes.
10053. These properties have depreciated in value since then? Yes, I am sorry to say they have.
10054. *His Honor.*] Is there any appreciable difference between the values of property in the middle of last year and at the present time? The value would be weaker, I should say, by 10 per cent.
10055. *Mr. Carter.*] If I told you that I had refused £16 and £17 a foot within the last three months for the Miller-street property, would that alter your opinion of its value? It would not.

George Christie re-called and further examined:—

10056. *Mr. Parkes.*] Since you were last here you have made various researches into papers in connection with contracts let to Carter & Co., and you are in a position to make a report? Yes. G. Christie.  
22 July, 1896.
10057. In the first place, you have made an examination into the position of the dealings of Mr. S. H. Weedon, supervising and district engineer, with Carter & Co., and stated to have been with Mr. John Carter? Yes.
10058. Will you read the result of your researches? Yes; I have written the following memorandum:—

MEMO. No. 6.

FINANCIAL dealings of Mr. S. H. Weedon with Messrs. Carter, Gummow, & Co.

Mr. Carter has furnished and lodged with the Commission a list and description of all his properties, also those of Messrs. Carter & Co. and Carter, Gummow, & Co. He has also furnished a description of the properties over which an equitable charge was given to Mr. Weedon by deed, dated 17/6/95. The schedule to the deed includes four properties, regarding which Mr. Carter's lists furnish the following particulars:—

- No. 1.—Vacant land. Title in the name of John Carter, but held by him in trust for G. Forrest, D. Snodgrass, and self equally.
- No. 2.—Vacant land. Title in the name of John Carter.
- No. 3.—Land and stables. Title in the name of Edward Carter.
- No. 4.—Detached cottage at Marrickville. Title in the name of John Carter, but held in trust by him for F. M. Gummow, G. Forrest, James Gillan, and self, equally.

These properties have been valued by Messrs. Richardson and Wrench, as follows:—

|             | £      | s. | d. |
|-------------|--------|----|----|
| No. 1 ..... | 337    | 10 | 0  |
| No. 2 ..... | 594    | 0  | 0  |
| No. 3 ..... | 170    | 0  | 0  |
| No. 4 ..... | 550    | 0  | 0  |
|             | £1,651 | 10 | 0  |

It is evident from the foregoing that of the four properties, the deeds of which Mr. Weedon holds, two are the property of Carter and Co. and Carter, Gummow, & Co. respectively, viz.:—

|                        | £    | s. | d. |
|------------------------|------|----|----|
| No. 1, valued at ..... | £337 | 10 | 0  |
| No. 4, valued at ..... | 550  | 0  | 0  |
|                        | £887 | 10 | 0  |

As to No. 3, the title is in the name of Edward Carter, for whom, apparently, Mr. John Carter is administrator. The value of this property is £170. No 2 is in John Carter's name, and is valued at £594.

Sydney, 22/7/96.

GEO. CHRISTIE,  
F.S.A.A.

10059. It would seem, therefore, that the money lent by Mr. Weedon upon the properties referred to is in excess of the value of those properties? Yes. The valuation of the properties is £1,651 10s., and the advance made is £2,000.
10060. And the greater proportion of the properties which he holds as securities belongs to the firm of Carter, Gummow, & Co.? Yes. The total is stated to be £887 10s.
10061. Belonging to the firm? Yes.
10062. So that a little more than one-half of the value of the properties which he holds as securities attaches to properties held by Carter, Gummow, & Co.? Yes.

10063.



G. Christie. 10063. You have also examined papers in connection with the testing of cement, especially with reference to the cement tested by the Department of Public Works for Contracts 79, 79A, and 69? Yes; I have written the following memorandum:—

## MEMO. No. 7.

Re Cement tested by the Department of Public Works for Contracts 79, 79A, and 69.

(a) REFERENCE is made to Mr. Roberts' evidence regarding his records of cement tested. (b) From his Registers of Tests has been extracted the following statement of cement tested for Carter & Co. and Carter, Gummow, & Co., for Contracts 79, 79A, and 69. The total number of casks of cement tested for these contracts is shown by the Statement to be 11,740, distributed as follows:—

| North Shore Contracts— |     |     |     |     |     |       |        |
|------------------------|-----|-----|-----|-----|-----|-------|--------|
| 79                     | ... | ... | ... | ... | ... | ...   | 5,050  |
| 79A                    | ... | ... | ... | ... | ... | ...   | 1,500  |
|                        |     |     |     |     |     |       | 6,550  |
| Contract No. 69        | ... | ... | ... | ... | ... | ...   | 5,190  |
|                        |     |     |     |     |     |       | 11,740 |
|                        |     |     |     |     |     | Casks | 11,740 |

Sydney, 22 July, 1896.

GEO. C.

STATEMENT of the Quantities of Cement tested by the Department of Public Works for Contracts 79, 79A, and 69. (Extracted from the Record Books of Cement Certificates, and tallying with the certificates signed by Mr. Hickson, included in the portfolios of papers of those contracts.)

| Register No. | Date.    | Total. | Distributed to Contract No. |        |        | Register No. | Date.    | Total. | Distributed to Contract No. |        |        |
|--------------|----------|--------|-----------------------------|--------|--------|--------------|----------|--------|-----------------------------|--------|--------|
|              |          |        | 79.                         | 79A.   | 69.    |              |          |        | 79.                         | 79A.   | 69.    |
|              |          | Casks. | Casks.                      | Casks. | Casks. |              |          | Casks. | Casks.                      | Casks. | Casks. |
| 779          | 11/10/92 | 900    | 900                         | .....  | .....  | 1,018        | 29/5/94  | 200    | .....                       | .....  | 200    |
| 838          | 1/5/93   | 300    | 300                         | .....  | .....  | 1,026        | 5/6/94   | 200    | .....                       | .....  | 200    |
| 862          | 17/7/93  | 500    | 500                         | .....  | .....  | 1,038        | 13/6/94  | 300    | .....                       | .....  | 300    |
| 868          | 21/7/93  | 500    | 500                         | .....  | .....  | 1,059        | 25/6/94  | 50     | .....                       | .....  | 50     |
| 874          | 2/8/93   | 180    | 180                         | .....  | .....  | 1,063        | 30/6/94  | 450    | .....                       | .....  | 450    |
| 876          | 7/8/93   | 1,200  | 1,200                       | .....  | .....  | 1,071        | 6/7/94   | 400    | .....                       | .....  | 400    |
| 877          | 7/8/93   | 400    | 400                         | .....  | .....  | 1,075        | 10/7/94  | 1,300  | .....                       | 1,300  | .....  |
| 878          | 8/8/93   | 620    | 620                         | .....  | .....  | 1,088        | 9/8/94   | 390    | .....                       | .....  | 390    |
| 942          | 2/2/94   | 1,300  | .....                       | .....  | 1,300  | 1,156        | 23/11/94 | 1,300  | .....                       | .....  | 1,300  |
| 943          | 5/2/94   | 100    | 100                         | .....  | .....  | 1,302        | 5/9/95   | 200    | .....                       | 200    | .....  |
| 945          | 9/2/94   | 300    | 300                         | .....  | .....  |              |          |        |                             |        |        |
| 974          | 6/4/94   | 50     | 50                          | .....  | .....  |              |          |        |                             |        |        |
| 981          | 16/4/94  | 600    | .....                       | .....  | 600    |              |          |        |                             |        |        |
|              |          |        |                             |        |        |              |          | 11,740 | 5,050                       | 1,500  | 5,190  |

GEO. C., 22/7/96.

10064. The book containing the cement tests by the Department is very carefully kept, is it not? It seems to be.

10065. The name of the contract to which cement is delivered is inserted? Yes.

10066. The name of the contractor is also inserted? Yes.

10067. Also the number of casks? Yes.

10068. And to show with what care the book is kept, there are only two alterations in the number of casks affecting tests in which Carter, Gummow, & Co. were concerned? Yes. There are two quantities indefinite in that respect. In one case 700 in red ink is put over 500, and in another case 600 is marked for 500. In neither of these cases do the certificates affect the return I have handed in.

10069. Then what do you say as to the difference between the information you have collected from the merchants and the records of cement tests for Carter & Co. upon these contracts? In my memo. of the 8th July it is stated that the quantities delivered at North Shore, Contracts 79 and 79A, were 6,702 casks, and to the Marrickville Contract 69, 6,729 casks, giving a total for these contracts of 13,431 casks; the total quantity of casks tested being 11,740 casks.

10070. That is the total quantity of cement submitted for test in connection with these three contracts? Yes.

10071. It does not include that which has been rejected, does it? It includes all that has been tested, whether rejected or not.

10072. You have also prepared a memorandum setting forth the effect of certain claims wrongly included in Contract 79? Yes; reference is made to pages 321 and 322 of the Parliamentary papers, and my report is as follows:—

## MEMO. No. 8.

Re certain Claims included in payments on Contract 79, which were properly chargeable to the Bondi Contract, &c.

(a) ON pages 321 and 322 of the Parliamentary return there are lists of certain amounts claimed by Carter & Co. which are evidently not chargeable to Contract 79, excepting, possibly, in one or two instances, but which Mr. Boys, the Resident Engineer on Contract 79, was instructed by Mr. Davis (minute 14/12/93) to include in the next progress return of that contract. There is a further minute as follows:—"The fines had better be 'returned' under the item of 'dray, &c.,' in schedule." Mr. Boys appears to have again asked for instructions on 19/12/93, and Mr. Davis to have confirmed his previous instructions, 20/12/93.

(b) Items included in certificate 24, Nos. 43, 44, 46, 47, and 48, clearly do not belong to Contract No. 79, for the rates are different to the corresponding items in the schedule for that contract.

For instance—

Item 43 is charged at 16/-, should be 20/-.  
Item 44 do 12/-, do 14/-.  
Item 46 do 10/-, do 10/-.

Item 47 is charged at 20/-, should be 15/-.  
Item 48 do 10/-, do 8/-.

10073.

10073. You have also prepared a memorandum in reference to the returning of Messrs. Bond and Hudson's tender deposit, (£369) in connection with Contract 79? Yes. It is as follows:—

G. Christie.  
22 July, 1896.

## MEMO. No. 9.

*Re* the returning of Messrs. Bond and Hudson's tender deposit (£369), Contract 79.

The tenders for Contract 79 were made on the Department's printed form. Messrs. Bond and Hudson's tender on this form appears on page 252 of the printed papers as follows:—

## TENDER for Contract No. 79, Sydney Sewerage.

To the Honorable the Minister for Public Works, Bridge-street, Sydney, N.S.W.

We, the undersigned, do hereby tender and offer to construct, completely finish, and maintain, the various works for Contract No. 79, Sydney Sewerage, in accordance with the conditions of contract, specifications, and drawings, prepared for that purpose in your Department, for or at the rates particularly entered in the accompanying schedule of prices, and enclose herewith deposit, as required by clause 20 of the general conditions.

Should this tender be accepted, we undertake to lodge with the Under Secretary for Public Works, within seven days from the date of notification of acceptance of this tender, a Bank deposit receipt in the name of the Secretary for Public Works for the sum of two thousand pounds sterling, as security for the due performance of the contract.

In the event of our failing to do so, or to sign the required contract within the time specified in clause 20 of the general conditions, we hereby distinctly agree to forfeit to the Queen the sum deposited with this tender.

BOND AND HUDSON,  
88, Sussex-street.

Sydney, 10th June, 1891.

The general conditions contain the following:—

In the event of any tenderer failing to take up his tender, complete the bond, and proceed with the contract within the time specified, or withdrawing his tender after it shall have been opened, whether such tender shall have been accepted or not, all moneys deposited by him on account thereof, or in connection therewith, shall be forfeited to the Crown, and in such case be paid to the credit of the Consolidated Revenue of the Colony. Forfeiture of cash security.

From the records it appears that, consequent on the withdrawal of Bond and Hudson's tender, the Department proceeded to *at once* call for fresh tenders. This and the stringent regulations in paragraph 3 of the tender [see above] are very material points in the consideration of the action of the officers of the Department in returning Bond and Hudson's deposit. 22/7/96.

GEO. C.

10074. You have also prepared a statement with reference to the loss sustained in connection with Contract 79, by letting the contract without re-tendering? Yes; it is as follows:—

## MEMO. No. 10.

*MEMO. B re* the letting of Contract 79 without re-tendering.

Reference is made to my memo. No. 5 on this subject, dated 15/7/96. Clause (a) of that memo. reads as follows:—

(a) Tenders for Contract No. 79 were originally invited for, and received on, 10th June, 1891. The lowest tender was that of Messrs. Bond and Hudson, £36,900 (on schedule prices). The next lowest was Carter & Co's. at £39,890.

The Tender Board recommended the acceptance of Messrs. Bond and Hudson's tender.

Seeing that Bond and Hudson's tender was £2,990 lower than Carter & Co's. the Crown sustained a loss in allowing Bond and Hudson to withdraw their tender. 22/7/96. GEO. C.,

10075. You have also a memorandum in reference to the surrendering of the security to which the Department was entitled under the conditions of Contract 79, and as to the effect upon the security held by the Government? Yes; my memorandum is in these terms:—

## MEMO. No. 11.

*Re* the surrendering of the security which the Department was entitled to under the conditions of Contract No. 79.

(a) The clauses dealing with the security to be given by the contractors for the due performance of the work as specified are as follows:—

In the general conditions, No. 18—

18. *Progress and Final Payments.*

No payments shall be legally due to contractor until after the entire completion of the contract; but progress payments on account, subject to all deductions herein provided for, will be made monthly, or as nearly so as may be, during the continuance of the contract, on the certificate in writing of the Engineer, at rates not exceeding those stated in clause 4 of the special conditions. Monthly progress payments.

The balance of the moneys due for works executed under this contract, less 5 per cent., and less the deductions properly to be made hereunder, will be paid within thirty days, or as nearly as may be, after the Engineer shall have certified under his hand that all the works under the contract, less those of maintenance, have been fully and satisfactorily completed, and that such balance, less the 5 per cent., is due to contractor. Balance.

Provided that, if the amount for maintenance, as entered by contractor in his tender, shall appear to the Engineer to be insufficient, the Minister may retain, on the declaration to that effect in writing by the Engineer, either the whole or any part of the sum otherwise deemed payable to contractor, till all the works under the contract, including those of maintenance, shall have been finally and satisfactorily executed. Insufficient balance.

The said five (5) per cent., together with the "cash security" provided for in clause 20 of these conditions, will be retained until after the expiration of the "period of maintenance" more particularly described in clause 3 of the special conditions, and shall be paid to contractor (less the cost of any repairs or defects, should the contractor fail to execute the same) on the production of a certificate from the Engineer that all the works under the contract, including those of maintenance, have been finally and satisfactorily executed. Final payment.

And part of clause 20:—

Within seven days from the date of notification in writing to any tenderer of the acceptance of his tender by the Minister, the successful tenderer must lodge with the Under Secretary for Public Works the sum named in clause 6 of the special conditions, which sum will be retained as security for the due performance of the contract until after the expiration of the "period of maintenance," and returned to the contractor (if at all) only on the day of final payment, and less any deductions which hereunder may properly be made therefrom. Cash security.

In the special conditions—clause 4 (referring to clause 18 in the general conditions)—as follows:—

*Clause 18 of General Conditions.*

4. The "rates of progress payment" shall be 90 per cent. of the value of work actually done, performed, and delivered, as the Engineer may approve of as fit and necessary for the work.

Clause 5 (referring to clause 20 of the general conditions)—

*Clause 20 of General Conditions.*

5. The "deposit" to accompany the tender shall be as required by clause 20 of the general conditions.

(b) On 23/3/93, Mr. Armstrong, as agent for Carter & Co., applied for a return of the deposit (£2,000), held by the Department. This application was refused. [See printed papers, Nos. 57 and 58, on pages 315 and 316.] The application was renewed by W. Armstrong, 21/4/93, and after it had passed through the hands of various officers, Mr. Hickson added a minute, as follows:—"A voucher has been signed to-day for work done, amounting to £1,453 9s.—R.H., 27/4/93." This minute of Mr. Hickson does not disclose the fact that, in the certificate he refers to, the Department actually returned a portion of the retention-money, viz, £222 17s. 7d., nor does it disclose that, to produce this amount of £1,453 6s., the Department had made an advance on 900 casks of cement at 16s., amounting to £720.

Further, by the ordinary reading of Mr. Hickson's minute, it would not appear to authorise any return of the retention money; but, as he quotes the amount, the certificate must have been before him, and it bears evidence that £222 17s. 7d. of the retention-money had been returned. This

G. Christie.  
22 July, 1896.

(c) This action of Mr. Hickson's is at variance with his minute a month before (25/3/93), on paper 57, in which he says "the contractors have good prices for work done, whereas work to be done is put down at low figures. I cannot recommend that their application be granted.—R.H., 25/3/93." Furthermore, from 10/3/93, to 27/5/93, there was very little work being done on Contract 79, and, as a matter of fact, the value of the work actually done during the period covered by Certificate 13 (27/4/93), was, on schedule prices, only £567 6s. 0d.

It will thus be apparent that the payment of £1,453 9s. 0d. under Certificate No. 13 consists of the following:—

|                                | £   | s. | d. | £      | s. | d. |
|--------------------------------|-----|----|----|--------|----|----|
| Work done .....                | 567 | 6  | 0  |        |    |    |
| Less 10 per cent. ....         | 56  | 14 | 7  |        |    |    |
|                                |     |    |    | 510    | 11 | 5  |
| Advance on cement .....        |     |    |    | 720    | 0  | 0  |
| Retention money returned ..... |     |    |    | 222    | 17 | 7  |
|                                |     |    |    | £1,453 | 9  | 0  |

(d) From and after the passing of Certificate 13 the Department did not retain fully 10 per cent. of the amount of work done, but they returned to the contractors on each certificate the amount of retention money in excess of the sum of £1,989, which was the amount that existed prior to issue of Certificate No. 13. The Department so continued until on the issue of Certificate No. 20 they had returned retention money to the amount of £1,306, as is more fully shown in the following statement:—

RETENTION Money returned prior to completion of Contract 79.

| Date.   | Progress payment No. | Amount of work done to date. | Retention money at 10 per cent. | Actual amount retained. | Difference total Retention Money returned to each date. | Date.    | Progress payment No. | Amount of work done to date. | Retention money at 10 per cent. | Actual amount retained. | Difference total Retention Money returned to each date. |
|---------|----------------------|------------------------------|---------------------------------|-------------------------|---|----------|----------------------|------------------------------|---------------------------------|-------------------------|---|
| 27/4/93 | 13                   | £ 22,118 16 0                | £ 2,211                         | £ 1,989                 | £ 222   | 5/12/93  | 20                   | £ 32,951 14 6                | £ 3,295                         | £ 1,989                 | £ 1,306   |
| 1/6/93  | 14                   | 22,954 10 0                  | 2,295                           | 1,989                   | 306   | 8/1/94   | 21                   | 35,123 6 0                   | 3,512                           | Nil.                    | 3,512   |
| 5/7/93  | 15                   | 24,458 14 6                  | 2,445                           | 1,989                   | 456   | 2/2/94   | 22                   | 36,955 13 9                  | 3,695                           | Nil.                    | 3,695   |
| 3/8/93  | 16                   | 25,533 19 0                  | 2,553                           | 1,989                   | 564   | 5/3/94   | 23                   | 38,750 11 9                  | 3,875                           | Nil.                    | 3,875   |
| 4/9/93  | 17                   | 27,186 0 8                   | 2,718                           | 1,989                   | 729   | 17/5/94  | 24                   | 39,491 19 9                  | 3,949                           | Nil.                    | 3,949   |
| 3/10/93 | 18                   | 29,069 12 0                  | 2,906                           | 1,989                   | 917   | 10/10/94 | Final.               | 40,023 10 3                  | Nil.                            | .....                   | .....   |
| 8/11/93 | 19                   | 30,696 17 0                  | 3,069                           | 1,989                   | 1,080   |          |                      |                              |                                 |                         |   |

GEO. C.

(e) During the same period the Department advanced to the contractors large sums of money on cement, commencing with Certificate No. 13 and ending with Certificate No. 20, and attaining (with Certificates 17 and 18) to the sum of £2,160, as will be seen in the following schedule:—

AMOUNTS advanced on cement, Contract 79.

| Progress Certificate. |             | Amount.   | Particulars.                        |
|-----------------------|-------------|-----------|-------------------------------------|
| No.                   | Date.       |           |                                     |
|                       |             | £ s. d.   |                                     |
| 13                    | 27/4/93 ... | 720 0 0   | 100 per cent. on 900 casks, at 16s. |
| 14                    | 1/6/93 ...  | 720 0 0   | " 900 " 16s.                        |
| 15                    | 5/7/93 ...  | 696 0 0   | " 870 " 16s.                        |
| 16                    | 3/8/93 ...  | 1,360 0 0 | " 1,700 " 16s.                      |
| 17                    | 4/9/93 ...  | 2,160 0 0 | " 2,700 " 16s.                      |
| 18                    | 3/10/93 ... | 2,160 0 0 | " 2,700 " 16s.                      |
| 19                    | 8/11/93 ..  | 1,760 0 0 | " 2,200 " 16s.                      |
| 20                    | 5/12/93 ... | 1,280 0 0 | " 1,600 " 16s.                      |

GEO. C.

As stated in my memo. No. 2 of 8/7/96, these advances were made at the rate of 16s. per cask, whereas the market value did not amount to 11s. 6d., delivered on the works.

(f) A third application was made by the contractors in connection with the return of retention money, namely, in their letter of 28/12/93 (see paper No. 78). The contractors used as an argument for the granting of their request that they were accepting payment in Funded Stock for work on Contract 69, and that they anticipated some trouble would be experienced in disposing of the stock during the first few months. Contract 69 was accepted only the day before (on 27/12/93), but the contract was not signed until 22/1/94; the first payment was £2,610 by certificate of 19/2/94, and the contractors received that amount in cash, and it was not until the certificate of 16/4/94 that they were asked to accept Funded Stock. It might also be mentioned in connection with Contract 69 that the contractors claimed concessions for the acceptance of Funded Stock to the extent of asking that sureties should be accepted in lieu of a cash deposit of £2,260. At the risk of the Department the contractors were thus financially helped to the extent of £5,555.

This third application was made just prior to the issue of Certificate No. 21, and when there was a balance of retention money on Certificate 20 of £1,989. The application was recommended to be granted by Mr. Davis because there was the original deposit of £2,000 still with the Department, and, by Mr. Hickson, because of the condition of their Contract 69 providing for their accepting payment in Funded Stock. The recommendations were approved, "W.J.L., 5/1/94," and the contractors were refunded all retention money in certificate 21. From this date onwards the contractors were paid the amount of the full value of the work at schedule prices, the total further payments amounting to £4,900.

(g) The £2,000 contract deposit had been placed at interest with the Bank of New Zealand, and the term was expiring on 10/6/94. A minute was written on 9/6/94 drawing attention to this fact and asking for instructions. The return of the deposit was recommended by Mr. Hickson, 13/6/94, and approved, "W.J.L., 16/6/94," and the amount was returned to Carter & Co. on 20/6/94.

(h) Mr. Hickson's minute, last referred to above, stipulates that £650 be deposited as security on the further contract, designated 79 A, the tender for which was accepted without competition on 16/6/94. But this £650 had clearly nothing to do with the completion and maintenance of Contract 79, so that the position of the Department was that they had absolutely no security for the completion and maintenance of Contract 79, either by way of contract deposit or retention money, from 20/6/94, other than the £531 10s. 6d., the amount of the final certificate. This final certificate was not given till some four months after, namely, 10/10/94.

(i) Clause 18 distinctly provides that the cash security shall remain until after the period of maintenance. This period was three months, and did not expire until about the month of October, 1894.

GEO. C., 22/7/96.

10076.

10076. You have also a memorandum as to the rearrangement and substitution of schedule items in Contract No. 79, after the Contract was let by the Department, and in connection with which Carter & Co. received payment upon their final certificate? Yes. I have prepared that memorandum up to a certain point; but it is not complete. G. Christie.  
22 July, 1896.

10077. You have prepared it with reference to expert evidence to be given at a later stage? Yes; it is as follows:—

MEMO. No. 12.

Re the rearrangement and substitution of Schedule items, Contract 79.

(a) On page 305 of the Parliamentary Return appears the following paper, numbered 23:—  
Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.

Minute Paper.

Subject:—Contract No. 79—North Sydney Outfall Sewer.—Driving of Tunnels.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 19 May, 1892.

THE tunnels from some of the shafts on this contract will be commenced in a few days, and it is, therefore, necessary that it should be settled how they are to be driven, whether with 4-inch charges of compressed powder, 2-inch charges, or without blasting.

With a view of arriving at the method which would give the least annoyance to the residents in the vicinity of the sewer, consistent with economy, I have made comparative estimates.

The excavation by "guttering and gadding" will cost 3s. per cubic yard more than with 4-inch charges of compressed powder, but, as it is impossible to drive the tunnel by blasting to the exact size desired, considerably more concrete has to be used in lining when the driving is done by blasting than when done by "guttering and gadding," and, taking this into consideration, I estimate it will cost about £1,250 less to do the tunnels without blasting compared with doing it with 4 inches of powder.

The 2-inch charges, with the extra supervision that would be required, would be the most costly of any.

I wish, however, to point out that while it would save annoyance and money to drive the tunnels without explosives, it would take longer to do the work.

J. DAVIS.

Messrs. Carter & Co. have undoubtedly fixed their schedule prices speculatively to increase their profits on the contract as much as possible, and, if so, to the loss of the Department. Mr. Davis seems, therefore, justified in the suggestions made, as they would likely cause a saving of £1,000, and clause 55 of the specification is no doubt a saving clause against speculative prices.—C. H. OHLFSEN BAGGE, 19/5/92. The Engineer-in-Chief.

Ask contractors to see me on Thursday morning.—R.H., 23/5/92. Messrs. Carter & Co., 23/5/92.

While I think the Department would hardly be justified in adopting this unusual method of carrying out the work, it is very clear we should aim at getting our work done as economically as possible. Blasting may, therefore, be allowed on the understanding that the average allowance of 4 inches for concrete packing over and above specified size of tunnels be reduced to 2 inches.—R.H., 26/5/92. Mr. Davis.

Contractors informed. Copy of letter attached.—J.D., 27/5/92.

The minutes on this paper settled that most important question whether the tunnels were to be driven by "guttering and gadding" or by "blasting." The original minute is that of Mr. Davis, 19/5/92, in which he practically recommends that the work be done by "guttering and gadding," and points out that there is an estimated saving of £1,250 by so doing. Mr. Bagge's minute, following on the same date, refers to Carter & Co.'s schedule prices as speculative to increase their profits to the loss of the Department, refers to clause 55 of the specification, and supports Mr. Davis's recommendation ("suggestion").

The next minute is that of "R.H., 23/5/92. Ask contractors to see me on Thursday morning." He then, on 26/5/92, writes the following minute, addressed to Mr. Davis:—"While I think the Department would hardly be justified in adopting this unusual method of carrying out the work, it is very clear we should aim at getting our work done as economically as possible. Blasting may, therefore, be allowed on the understanding that the average allowance of 4 inches for concrete packing over and above specified size of tunnels be reduced to 2 inches.—R.H., 26/5/92." In this Mr. Hickson misconstrues Mr. Davis's recommendation, supported by that of Mr. Bagge, and orders that the work be done by blasting. The contractors were accordingly notified, 27/5/92.

In Mr. Hickson's minute, 26/5/92, and in the letter to the contractors, 27/5/92, it is stated as a stipulation that—"The cross-sections will be taken in the usual manner, and you will be paid for the excavation ordered, and for a maximum of 2 inches of concrete lining in excess of the excavation ordered." To this letter the contractors replied on 2/6/92, accepting the conditions, but pointing out that the 2 inches would make a total of 7½ inches, instead of 7 inches as stated in the Department's letter.

(b.) The payment for this extra excavation and concrete is again referred to in the contractor's letter of 10/8/93, the contractors asking for the agreement to be amended in their favour. Mr. Davis's minute thereon, 14/8/93, recommends that the margin of 2 inches be increased to 3½ inches, and Mr. Hickson's minute thereon is as follows:—"The 2 inches was decided upon on the assumption that the average allowance for concrete packing was 4 inches. As it is now stated, this really works out at 5½ inches, Mr. Davis's suggestion is only fair and equitable, and may therefore be adopted.—R.H., 15/8/93." This decision was communicated to the contractors by letter of 21/8/93.

(c.) From a perusal of the specification, and particularly of clauses 58 and 59, I cannot see that the contractors were, in the first place, entitled to the 2-inch margin.

GEO. C., 22/7/96.

10078. *Mr. Parkes.*] In connection with the lining of the sewer there is a further increase to 8½ inches? Yes. I have referred to it, as the matter was again referred to the Department. They wanted the 2½ inches increased to 3½ inches.

10079. In connection with the cement tests, I notice that on 22nd June, 1894, 1,300 casks submitted for test in connection with Contract 79 were condemned—that is, they did not pass the test? That is so.

10080. The certificate is minuted, "In the shed of the contractors." It remained there from June until 23rd November, when it was again tested. There is a minute upon the second certificate to this effect—"Second test of 1,051, after being kept in store on Contract 69 since 20th June, 1894." That would be there from 20th June to 23rd November. The cement then passed? Yes.

10081. Are there any tests recorded in connection with Contract 69 between the dates which I have given you? Yes, there are certain records.

10082. Will you enumerate them? There is a test of fifty casks on the 25th June, 450 casks on 30th June, 400 casks on 6th July, and 390 casks on 9th August, making a total of 1,290 casks tested between those two dates.

10083. That would be all kept in the shed according to the records upon these tests? Referring to certificate 1,071, I should say that the cement was in that case on the contract. That will probably be the case in the other instances.

10084. *Mr. Davis.*] I wish you to refer again to the evidence you have given with respect to the material and labour supplied for the contract at Bondi. In the first place I think you said that the whole of the quantities returned upon the certificate No. 24 under items 43, 44, 46, 47, and 48, were quantities used in connection with the Bondi work? Yes; Bondi and some other contract.

10085. Are you in a position to say that that is a fact? Yes, from a comparison of the items and also the prices.

- G. Christie. 10086. I want you first of all to deal with the question of quantities;—have you gone carefully through the printed papers? Yes.
- 22 July, 1896. 10087. Have you taken out of the list of works given upon pages 321 and 322 of the Parliamentary papers the items you mention as having reference to the work at Bondi? I have not summed them up from the certificates, but I have compared the items.
10088. Would you be surprised to find that instead of the amount chargeable to the Bondi work being £23 5s. 6d., as you supposed to be shown by progress payment No. 24, it is actually £11 1s.? I should. There are a number of small items, but I compared them sufficiently to warrant me in making that statement, I think. But if you will prepare a list I shall be quite prepared to accept it after checking it.
10089. Coming to the question of rates. I think you said that the correct rates according to the schedule attached to the contract for items 43, 44, 46, 47; and 48 were respectively as follow—20s., 14s., 10s., 15s., and 8s.;—will you turn up the schedule and see whether that is so or not? I referred to Bond and Hudson's tender originally, and the figures I have given are taken from that schedule.
10090. But will you look at the schedule attached to the contract? I notice that that schedule does differ from the schedule from which I took my figures.
10091. Is not that a matter upon which you should have satisfied yourself before making a statement of this kind? I took it that one schedule would be the same as the others. I see that Portland cement is put down in the schedule to which you refer me at 16s.
10092. But that is not 20s.? You have paid at 16s. and the price given here is 16s.
10093. *His Honor.*] Where did you get your prices from originally? I obtained them from the schedule attached to the first tender in this contract and the specification issued at the time. How it comes to be altered I cannot say. I took ordinary precautions in making my investigations.
10094. Are not schedules fixed by the contractors in all cases, the quantities being given by the Department? Yes; I see that in this case I am entirely wrong. I find that I have been dealing with a contract in which the schedules had been fixed by the contractors.
10095. There has been a misconception on your part of the form of tender? Yes.
10096. *Mr. Davis.*] Take item No. 44;—what is the rate attached to that? Twelve shillings.
10097. Take item 46? I think if His Honor will allow me to do so, my better plan would be to withdraw this memorandum to correct it. I can hand it in at a later stage.
10098. *Mr. Parkes.*] Does the mistake to which Mr. Davis has directed attention make any great alteration? No. And as regards the quantities, it is for the Department to say whether the quantities, quite irrespective of the price, went to Bondi or not.
10099. *Mr. Gummow.*] You said, I believe, that the Department lost a great deal through Messrs. Bond and Hudson's tender not being accepted? Yes.
10100. Have you read a letter from Mr. Bond which appears upon page 270 of the Parliamentary papers, in which he withdraws his tender? I had read that previously.
10101. And could the Department accept his tender when he had withdrawn it? They could have held him to it.
10102. Will you turn to page 298 of the Parliamentary papers, and read the paragraph referring to the failure of a tenderer to proceed with the contract? Yes. It is as follows:—

Whenever a Tenderer shall fail to proceed with a Contract as aforesaid, fresh Tenders shall be invited at short notice for the work, unless in the opinion of the President there are circumstances which make it desirable for another Tender in the same series to be accepted; but the Tenderer by whose default such a course has been rendered necessary shall be excluded from the competition, and from any competition for other works, at the pleasure of the President.

10103. According to that condition, has not the President of the Tender Board the right to use his judgment in accepting another tender or in calling for fresh tenders? The clause to which you refer me states that the Tender Board have the right to consider the matter at the time, but the position is that the Department allowed one tenderer to drop out and then immediately called for fresh tenders.
10104. The clause contains these words, "Unless in the opinion of the President there are circumstances which make it desirable for another tender in the same series to be accepted." If there were such circumstances the President would have the right to accept the second tender or any other tender? In this case the matter had gone beyond the Tender Board altogether. The Minister decided to call for fresh tenders.
10105. Have you read the whole of the papers in connection with Contract 79? A great many of them. Those with which I have been dealing I have specially read at the time. I could not say that I have read them all.
10106. Will you turn to page 316 of the Parliamentary papers;—you will see upon that page a letter from Mr. Armstrong? Yes. It is dated 31st April, 1893, and is as follows:—

I have the honor to ask reconsideration of your refusal to allow a return of part of the retention money held on account of Contract No. 79, North Shore Sewerage, and to point out that, in addition to deposit of £2,000, retention money now amounts to £2,000, and that Messrs. Carter have plant and machinery on the contract amounting to £3,500, and also materials to the value of £800, making a total security value of upwards of £8,000.

I respectfully submit that the Department will hold very ample security after a deduction of £2,000 from the retention money.

10107. Do you not think that that letter would carry a certain amount of weight with the Department? I am dealing with the exact conditions of that contract.
10108. But are those conditions absolutely binding upon the Department;—if it chooses to make certain alterations, cannot it do so? I would not like to express an opinion upon that point.
10109. Do you know if there are any circumstances which made the Department keep back £1,989 instead of keeping back the full retention money;—do you know of any circumstances which arose about that time which might induce them to give back the £222 you have spoken of, of retention money;—can you tell from the papers which you have read whether there were any circumstances which at that time justified the Department in taking such action? No. The construction I should put upon the papers is rather against it, because the works were not proceeding vigorously. I do not know from what cause the Department would have considered themselves justified in doing what they did.
10110. Do you know that at that time the Department could not get out fresh conditions for contracts? There is a paper upon page 316 which says something about new general conditions.

10111.

10111. Will you read Mr. Hickson's minute, appended to paper 58, upon page 316? Yes. It is as follows:— G. Christie.  
22 July, 1896.

All that contractors would be entitled to if the new general conditions were in force would be £70 19s. 5d. As these are not yet in force, and contractors have good prices for work done, whereas work to be done is put down at low figures, I cannot recommend that their application be granted.—R.H., 25/3/93.

10112. Do you know whether it was not considered at the time that when the total amount of retention money and the deposit amounted to 10 per cent of the contract all accruing retention money should be returned to the contractors? I had not read that.

10113. *Mr. Davis.*] I suppose that, when writing your statement with regard to rearrangement and substitution of schedule items in connection with Contract 79, you based it upon what you gathered from the Parliamentary papers? Yes.

10114. Will you tell me upon what you based this statement, "The payment for this extra excavation is again referred to in the contractors' letter of 10th August, 1893"? I think your original letter says that.

10115. Is anything said there about extra excavation being paid for? I interpret the reference there as being made to extra excavation. That is the clear conclusion I derive from it.

10116. You would conclude from the letter upon page 305 that only 2 inches of concrete lining in excess of the excavation ordered is to be paid for, and that the extra excavation is to be paid for in addition? That is my clear deduction from that letter.

10117. Does it state that? Yes.

10118. Will you point out where? It says in excess of the excavation ordered.

10119. Is it stated that extra excavations are to be paid for? I read it so.

10120. Will you point out to me where it says that extra excavation is to be paid for? That is what I interpret the clause to mean. If you refer to paper 65 upon page 317 you will find these words:—

The 2 inches referred to was fixed as being 2 inches less than usually works out as an average cross-section, but owing to the foregoing reason, and to unavoidable errors in the alignment, we ask to be allowed cross-sections equal to those of Contract No. 53, less the 2 inches which was intended to be deducted.

10121. Reading that paragraph with the context, would you take it to mean what you say? Yes.

10122. Will you read the first paragraph of the letter? Yes.

Referring to our letter of 2nd June, 1893, in which we accept a maximum thickness of 2 inches over plan dimension as the quantity to be paid for lining tunnel on Contract No. 79, North Sydney sewerage, we beg to state that this was agreed to on the supposition that the ground would admit of such dimension being practicable.

They go on to say that it is not practicable, and they want more measurements.

10123. But is anything said there about extra excavation? Certainly. Otherwise what do they mean by cross-sections. It shows that they wanted larger cross-sections, I think.

Joseph Davis, recalled, and further examined:—

10124. *Mr. Parkes.*] What is the course which the Department follows with regard to the testing of cement stored upon works? The contractors when they have a whole parcel in the shed generally apply to the Inspector or to the Resident Engineer for samples to be taken. J. Davis.  
22 July, 1896.

10125. But what is the course followed when the cement is put upon the job—is it kept in a shed? Yes.

10126. Is that shed always locked? No it is not. It could be locked in the evening; but they would be taking cement out of the shed probably most of the day.

10127. Who has charge of the key? In some cases we have, but not in every case.

10128. Is it not a regulation of the contract that the Inspector or Supervising Engineer shall have charge of the key of the cement-shed? I am not sure that it is. I believe that is so in the case of some contracts, but not in the case of all. I should have to look up the particular contract to which you refer.

10128½. Is it not a general regulation of the Department? I do not think it is. I have had it in cases where I have been suspicious—that is, I have had the key kept by officer on the work, because his duty is to visit the shed once, or, if necessary, oftener, during the day, and he would keep a tally of the cement in that way. He would be able to tell at once if anything were going wrong.

10129. Do the Inspectors send in every day a return of the casks used? At one time they did. They do not now.

10130. When did the change take place? First of all it was the custom for many years to keep in a book the quantity of cement used on a contract. That was right enough, but I adopted a system about four years ago under which the inspectors were to report to me each day. In their report they would give the number of casks used during the day, the number of men employed, and other tabulated information which we record in the office. I gave up charge of the sewerage works in April of last year, and that practice was then discontinued.

10131. What did you do with the returns when they came in—did you file them? They were not filed exactly, but they were put away for future reference.

10132. Have you them now? They are in some place or other. I dare say they could be found.

10133. Would they have to be searched for? I dare say I could put my hand upon some of them almost immediately.

10134. For how far back could you put your hands upon them? I could not say at this moment.

10135. Would it be for five years? The system was not in existence for that period. There might possibly be three years. Some might be missing and we should have to look for them, but that could easily be done.

10136. After you left your position in April, 1895, you still had a close connection with the sewerage contracts, had you not? I had nothing whatever to do with them.

10137. Have you not control of them now? Yes; since April of this year.

10138. For twelve months you had not control of them? No.

10139. What is done now in regard to the quantity of cement used—is the same course followed that was followed previously? I intend that it shall be so. I drafted a day or two ago instructions resuming the old practice. I believe in it.

10140. Will you tell His Honor what course has been followed in the interim? I believe a weekly report has been sent in.

10141. Are the reports in existence? I believe they are.

10142.

- J. Davis. 10142. They can be obtained? I believe so.
- 22 July, 1896. 10143. I believe you have already said that it would be impossible for cement to be sent to the work without the inspector knowing it? I do not think I have given any evidence upon that point.
10144. Would it be possible for cement to be used in the works without the inspector knowing it? No; I do not think so. It certainly would not be possible if the inspectors were doing their duty.
10145. Of what capacity are the sheds in question? They vary with the size of the contract. It depends entirely upon the quantity of cement which would require to be stored. We ask the contractors to keep enough cement in stock for (say) fourteen days ahead, or something of that sort.
10146. How do you regulate the quantity—are you guided by the extent of the contract? Yes.
10147. What quantity would be necessary in the case of a £20,000 contract? It would depend upon the nature of the contract. For instance, it might contain a good deal of concrete work, but it is a matter of calculation. It can easily be arrived at.
10148. But cannot you say, roughly assuming that you were carrying out an ordinary sewerage work, such as you are in the habit of carrying out? Say that one-half of it would be concrete work, that would mean (say) £10,000 in twelve months or £800 a month for concrete. That would represent (say) 400 or 500 casks a month.
10149. Then if it were a £45,000 contract the capacity would be about a thousand casks? It would depend, as I say, upon the quantity of concrete.
- 10150-1. Take an ordinary construction such as contract 69, the capacity of your shed would be about a thousand casks would it not? I should say there would have to be shed room upon the contract—in two or three sheds perhaps—equal to that if the contract were to go on without cessation.
10152. Is there more than one shed upon these works? I am not sure; I think there would be two.
10153. Two upon one contract? I am not sure. I could not say positively.
10154. Do the inspectors count the casks in the morning? No; they do not count the casks every day, but they know precisely how many casks would be used during the day. Suppose the contractors had been working three days and had used 60 casks, the inspector would be able to tell by looking into the shed and counting up the casks whether the quantity was correct.
10155. Therefore the most careful control is kept by the inspectors of the department over the quantity of cement? Yes.
10156. Take the quantity of cement which was allowed to remain in the contractor's shed upon contract 69, and which did not pass the test, it was allowed to remain there for a very long time? It appears to have been there from June to November.
10157. In the meantime would the inspector have control of the shed;—would he have the key or would the contractors have it? It is possible that the contractors would have control of the cement from June until it was retested, or until samples for retest were sent in in November.
10158. Is not that your initial at the bottom of the certificate? It is my name.
10159. All through these certificates bear your name? They are issued to me.
10160. You have control of the cement tests? I have.
10161. Would it not be your duty to see that this cement was taken charge of by one of your officers? Not in this case, and I will explain why. The cement would be sent in for testing, simply. The test in June would be made up to twenty eight days. If, at that time, the cement did not comply with the prescribed test, it would be condemned. In this case I see the cement was rejected at seven days. That is marked in the corner of the certificate. The contractors, believing that the cement would improve by keeping, would ask, in the ordinary way, to have the parcel retested in November. Fresh samples would then be taken and submitted to the usual test. The final certificate shows that the cement had improved, and that it was eventually accepted.
10162. If you have not charge of the key, what would there be in the meantime to prevent that cement from being used, and fresh cement being put in its place? First of all as to using it. The inspectors are on the ground the whole of the time, from the time the work starts in the morning until it is concluded in the evening. It is their duty to know what cement is being used. They know, therefore, whether the cement is approved or otherwise. If this cement were rejected in June, it would not be used. Then as to the cement being changed during the period which elapsed between June and November, that, as far as we are concerned, would not matter in the slightest degree. The test of cement in June stands upon its own merits, and speaks for itself. As it happened, the cement was rejected. The test for November, again, stands on its own merits, and it does not matter whether the same cement was tested in November as was tested in June. The cement tested in November was approved. That is sufficient for us.
- 10163-4. How many casks would be tested out of the 1,300? The practice is to take four samples in every hundred.
10165. So that the inspector must have definite information as to the number of casks on the job? They have definite instructions as to the way in which they are to take samples.
10166. Have they not definite information as to the number of casks on a job if they take four samples in every hundred casks? When they send in the particulars which are wanted at the head of each test they should certainly send them in accurately. If they do not do so they are to blame.
10167. Is it not set forth in your specification that rejected cement shall be immediately removed from the works? That is so.
10168. Is that not carried out? In a case like this the cement would scarcely be described as being on the work because it was in the contractors' shed—on private property, quite by itself, as far as my recollection serves me.
10169. Was it on private property? On property which the contractors rented, I believe.
10170. The Government advanced money upon the cement, did they not? Not on this cement, I think. In any case it does not matter, because we took the usual agreement.
10171. As to Contract 118, the cement of John Try, in bags, was condemned? A portion of it.
10172. A good portion of it? I could not say what proportion, but I know that a portion was approved.
10173. Some thousands of bags were condemned? I could not say. I see from the test book that 1,350 bags were submitted for test on 5th December, and apparently did not comply with the test.
10174. In January, 1896, 2,000 bags were also rejected? Yes.
10175. That accounts for 3,350? Yes.
- 10176.



10176. Why was that cement not removed from the work? As far as my recollection serves me, the cement was kept on the works with a view of retesting. There is a good deal of colonial cement which does not pass the test when it is delivered on to the work in the first instance, but which, when it has time to mature, does pass. The same thing holds good with regard to imported cement, but not to the same extent.

10177. You will see that it was held for about three months, and that, when it was tested on 12th February, it gave the worst results, viz., 148 lb., whereas the minimum is 200 lb.; it apparently diminished in strength by keeping; I am referring now to the twenty-eight days' test? It would appear from the book that on the 12th February 1,500 bags were re-tested. I should judge that this quantity was made up from test 1,333 and some other cement.

10178. You heard the evidence of your tester, who said that it would not stand the test, and was, therefore, rejected? I know that that is the fact.

10179. Then why was it left on the job;—is it not on the job at the present day? The work is finished.

10180. Why was it not removed from the job when it was condemned? My impression is that another test was made after that.

10181. Ought it not to have been removed from the works? It did not much matter in this instance, because the work is finished. It has been practically finished since about March, and this certificate would not be through until the end of that month.

10182. Was there not a good deal of cement work going on? The whole of the concrete work was finished in March.

10183. But it had to be cemented all over, had it not? Nearly 95 per cent. of the rendering had been finished at the time this test would be only just through.

10184. Will you produce for the use of the Commission the reports of your inspectors in regard to the cement used upon Contracts 69, 79, and 79A? Yes, with pleasure, if His Honor will direct their production.

10185. *His Honor.*] I suppose they can be produced without any great difficulty? I think so. I will do my best to let Mr. Parkes have them at the earliest possible moment.

10186. As you were not in actual charge of the sewerage works at the time, you cannot say why the cement of John Try was not removed? I know that the reason I have already given is the correct one—that is to say, that the contractors kept it there with the idea that it would mature. When it was brought down from Merrylands and put into the shed it had only just been made, and it frequently happens in the case of colonial cement that when it has been kept for two or three months it parts with a certain proportion of free lime, or rather the free lime slakes. The cement then stands the test. That would be the object of keeping the cement there. It really should have been stored at the cement works. But it was brought into the sewerage works, I presume, because Mr. Try thought it was in proper condition. It was found that it was not. We had to speak definitely upon that point after the first test—that is, had to say whether we would accept it or reject it. We could not accept it, and the contractors ran the risk of having another test made; keeping the cement in stock, I presume, with a view to its improvement.

10187. Can you say whether, in fact, any bag cement ought to have been used at any time during the course of this contract? Yes, I think so.

10188. What bag cement would it be? John Try's; some of that was approved, to the best of my recollection.

10189. You believe that some of John Try's cement was passed? Yes. I may explain in reference to what the witness Dawson has said on two or three occasions—Mr. Parkes can call the Inspector if he chooses, and he will find, I think, that this is the case—that it was directed that the casks of which Dawson spoke as having been filled should be filled in that way. Carter, Gummow, & Co.'s foreman asked the Inspector if he might leave intact a few casks, as some of the bags of cement had got damaged, and the cement could not be brought down on to the works in them. The Inspector reported to me that he allowed it, as he thought it a reasonable request. The casks were taken into the shed to be filled, in the way described, from approved cement.

10190. *Mr. Parkes.*] But was not that cement condemned in December? I cannot give you the dates. I can only tell you what was reported to me. [*Vide Appendix No. 38*]

10191. *His Honor.*] That would be the only legitimate reason then for putting bag cement into casks? There could be no other reason.

10192. For measurement it would be useless? Three bags would go to a cask. I suppose they would put three bags into a cask and then take the cask down to the work. The inspector will be able to tell you what happened.

10193. Is John Try's the only bag cement which is used? Goodlet and Smith also have some bag cement. I was not sure in this case whether the cement was Goodlet and Smith's or Try's.

10194. Would the bags of cement be marked? No, it is difficult to mark the bags.

10195. They would not be branded? No. When we approve of bagged cement we have to watch it.

10196. Then the same shed might contain cement in bags which had been rejected and other cement in bags which had been approved? They would be in different parts of the sheds. The inspectors have specific instructions not to allow condemned cement, or cement under test, to be mixed with approved cement—for instance, the door would be in the centre of the shed, and probably the approved cement would be upon one side of the door, and the cement under test would be on the other side, supposing both descriptions of cement were in bags.

10197. The key you say is not always kept at night by the inspector? Not always. In some cases where we have special reason to be careful that is done, but it is not the usual practice.

10198. What I understand you to say, then, is this—that you trust to the honesty of the contractors or of their foreman unless you have reason to doubt their honesty? We necessarily trust them to some extent. At the same time, the cement, from the time it is approved until it is in the work, is under constant supervision. The inspector is on the works the first thing in the morning, before work starts, and he is able to see whether the cement has been tampered with in any way during the night.

10199. Unless any bags have been shifted during the night? Even then he could tell from the general appearance of things, whether it was so or not. He could tell not only from the heap of approved cement being incorrect, but also from the heap of cement under test being decreased.

10200.

J. Davis.  
22 July, 1896.

- J. Davis. 10200. *Mr. Gummow.*] Do you know how the contractors buy their cement;—have you ever heard that they buy it absolutely from the merchants or importers, or whether it is bought subject to approval? I know as a matter of fact that the risk is far too great for the contractors to buy cement approved or not approved. They always stipulate—at least, so I am informed by contractors who have worked under me—with the merchants that they only buy approved cement, and if the merchant delivers cement upon the works and it is eventually rejected he will not only have to take the cement back but to bear the expense of carting it there and back. As a consequence they have to pay a higher price for the cement. The contractors tell me that that is the cheapest way for them to do their business.
10201. So that it is of no advantage to the contractors to use condemned cement so far as they are personally concerned;—the risk is the risk of the importer or the manufacturer? Entirely.
10202. It is clearly stated in the specifications that after cement has been condemned it is not to remain on the works longer than twenty-four hours;—is that specification absolutely carried out? It is like a great many other conditions of that description imposed by the Department. It is put into operation if necessary—that is, if it is to the interest of the Department to put it into operation. There are a great many laws which are not put into operation to-day, although legislators have made them.
10203. A certain amount of judgment is used by the Department in carrying out these clauses? Yes. If we saw that a contractor desired to do what was right and reasonable, we should endeavour to meet him.
10204. You apply, not only to Carter, Gummow, & Co., but to any other contractors any fair condition;—you do not allow these concessions to Carter, Gummow, & Co. exclusively? It might be very unreasonable to put this clause into operation. For instance, the cement might be condemned on a Saturday and we could not expect the contractor to cart it away on the Sunday. Forty-eight hours' notice in that case would have to be given.
10205. But do you or do you not draw any distinction between different firms of contractors in making concessions? I have only one answer to give to that. I endeavour to administer the specification, whether to one man or to another, as evenly as possible.
10206. You use your judgment;—you act according to the circumstances of the case? Yes. With regard to cement remaining upon contracts, take the case in which John Try's cement had failed to pass the twenty-eight days' test. Supposing it had not been tested before, and had just been brought from Merrylands on to the sewerage works—if it suited the contractors to ask that it be allowed to remain a little time to mature, that would be a most reasonable request to make, and one which the Department would consider. If that were not done, in nine cases out of ten it would mean that colonial cement could not be used.
10207. Have you ever allowed any other contractors to have cement re-tested? Yes.
10208. So that this particular concession, or whatever you may choose to call it, has not been limited to Carter, Gummow, & Co.? I have no particular liking for Carter, Gummow, & Co.
10209. You do not give them any more concessions than you would give to any other firm? I believe I do not.
10210. I think you might say that you do not? You want me to say that I am an impartial judge—that I am not human nature.
10211. But are you particularly partial to the firm of Carter, Gummow, & Co.? If I know myself I certainly am not. What others might think of my action is another thing.
10212. In your own judgment and action are you impartial or not? I believe myself to be so.
10213. *Mr. Parkes.*] The items, in the list I hand you, you recognise as having been in connection with the Bondi contract? Yes; the items upon that slip are for material and the cartage of material between North Shore and Bondi.
10214. These are items, which you have pointed out, which were expended in connection with the Bondi works, and charged to Contract 79? Yes. [*Vide Appendix No. 39.*]
10215. As far as you know, that is a complete list? Yes; those are the only items charged in that contract for work done at Bondi and for material used there.

George Christie re-called and further examined—

- G. Christie. 10216. *Mr. Parkes.*] You have amended your memorandum in reference to certain claims included in payments on Contract 79, which were properly chargeable to the Bondi contract? Yes; it now reads as follows:—

MEMO. No. 8.

Re certain claims included in payments on Contract 79, which were properly chargeable to the Bondi Contract, &c. ON pages 321 and 322 of the Parliamentary Return there are lists of certain amounts claimed by Carter & Co., which are evidently not chargeable to Contract 79, excepting possibly in one or two instances; but which Mr. Boys, the resident engineer on Contract 79, was instructed by Mr. Davis (minute, 14th December, 1893), to include in the next progress return of that contract. There is a further minute as follows:—“The fares\* had better be ‘returned’ under the item of ‘dray, &c.’ in schedule.” Mr. Boys appears to have again asked for instructions on 19th December, 1893, and Mr. Davis to have confirmed his previous instructions on 20th December, 1893.

Thomas William Bryant recalled and further examined:—

- T. W. Bryant. 10217. *Mr. Parkes.*] Will you look at the document I now hand you in connection with the construction of a Monier culvert on the Main Western Road near Ormond-street;—will you explain the minutes upon that document as briefly as possible? Yes, it is a minute by Mr. W. A. Smith, recommending the expenditure of £123 10s. for the construction of the culvert. Mr. Hickson asked Mr. Smith to see him on the 25th July, 1894, and subsequently Mr. Hickson approved, when it was noted by the Accountant that funds were available, reference being at the same time made to paper 94-5580 as to royalty which was to be paid to Carter, Gummow, & Co. It was then asked whether the work was to be done by day-labour or by contract. Mr. Smith in reply to the query said that the work was to be carried out by day-labour. The papers then came round to Mr. Symonds. Mr. Smith, I think, must have been away, and it would be usual in such cases for me to send the papers to Mr. Symonds. I see a pencil note on the paper for Mr. Symonds to see to the matter, and Mr. Symonds has written, “Seen and noted.” The papers were

\* NOTE (on revision):—Printed in error “fines” on page 322 of Parliamentary return.—G.C.

were then brought back to the Records. The Record Clerk says that he received them from Mr. J. T. W. Bryant, Symonds, and Mr. Smith then recommends that the work should stand over until 1895.

10218. Do you know whether Mr. Symonds complained of the money being taken out of his Road Vote? 22 July, 1896.  
Yes; he came to Mr. Smith about it.

10219. Is that the reason why the Monier culvert was not constructed at Ormond-street? Yes; Mr. Smith called me in, and wanted to know why I had sent the papers to Mr. Symonds without authority. As a matter of fact, that was not the case, because I had authority to do so when Mr. Smith was away. He was annoyed, and said that he did not want Mr. Symonds, senr., to have anything to do with that work, and that it was work for Mr. Symonds, junr., to do. In the meantime Mr. Symonds and Mr. Smith had a discussion as to the taking of money from the Main Western Road Vote.

10220. If Mr. Symonds had raised no objection the work would have been done without ministerial approval, would it not? Yes.

10221. Will you explain how the vouchers are signed and countersigned before they go to the account proper to which they should go? Take voucher No. 115 for example. Mr. Symonds signs in the first instance, and the expenditure is approved by Mr. W. A. Smith.

10222. And so also with regard to voucher No. 516? That contains the same signatures.

10223. The same thing applies to all the vouchers from which you compiled your statement as to the cost of the Monier street-culvert at Strathfield? Yes. Wherever the culvert is not specifically mentioned on the vouchers we reject them.

10224. The whole of those vouchers bear the signatures of Mr. Symonds and Mr. W. A. Smith? Yes.

10225. There are also clearly marked upon the vouchers the material, the place to which it was sent, and other indications from which it can be gathered that the vouchers apply to the Monier culvert at Strathfield? Yes; and Mr. Smith approved of the payment in each case.

10226. Since Mr. Smith gave his evidence the other day you have again gone through these vouchers to see that they are all signed by him, and that the whole of the labour and material which they include was properly included in your total? Yes.

10227. Have you seen any reason to alter your evidence? No.

10228. The whole of these amounts must go to the general account in connection with the Monier culvert, you think? Yes.

10229. The whole of these vouchers would go to the Auditor-General as accounts in connection with this culvert? Yes; the vouchers speak for themselves. A large amount of money is appropriated annually in connection with the Main Western Road, and it was for Mr. Smith to say whether he considered that the charges in connection with this particular culvert should be made to that account. In this case the vouchers are specially marked in connection with the material and labour put into the culvert, and in each case the voucher is signed by Mr. Smith.

10230. You have looked over the papers in connection with the Callan Park grant? Yes.

10231. What was the actual amount expended there? I endeavoured to get the papers yesterday, but I could not get them. I should think the amount expended would not exceed £450.

10232. Then only about one half of the money which was voted was used? Yes. The balance must have been taken for other purposes. Otherwise where has the money gone to. I could not get at the particulars yesterday, because I could not get the books I wanted.

10233. What prevented you from getting the books? Yesterday evening, when I was in the strong room, there was an objection raised to my being there, although I had an officer of the Department with me. They said that until the Under Secretary gave the necessary permission they could not permit me to stay in the room.

10234. Was the room in confusion? Yes; it was in a disgraceful state. The whole of the books were on the floor, and the whole place was in darkness.

10235. *Mr. Norrie.*] With regard to vouchers which you say are all in connection with this culvert, will you look at voucher 201? Yes. It is headed, "Roads Department—Iron Cove Bridge," but that voucher was written by John Keep and Co., and not by the Department. Mr. Bramston, I see, was asked whether the amount was correct, and he said it was, and the amount was entered as having been used upon the culvert.

10236. Then take voucher 389 for five casks of cement, which is marked "Iron Cove Store"? Five casks of cement were taken straight on to the works, and other casks went to the Iron Cove Store, until the carter had time to bring them out. I know that it came out because Larkin loaded it up.

10237. Do you know that he did so? Yes, he told me so.

10238. Then take voucher 191—that is headed "New Zealand Timber Co."? Yes; but at the top of the voucher you will see "Culvert at Burwood, Main Western Road." The timber was made up at the Iron Cove Store as has already been explained.

10239. Do you know that of your own knowledge? Yes.

10240. Then as to voucher 208? That is a similar case. The Iron Cove Store is where the wood-work was prepared. Mr. Smith has signed the voucher as correct, and it is headed "Culvert at Burwood."

10241. Do you know how much timber was used in the construction of the culvert? No; that was no part of my business. My business was to see that the money was forthcoming.

10242. But your evidence is that this timber was used in the construction of a culvert? Mr. Larkin and Mr. Bramston would be the two officers who looked after that matter, but Mr. Smith by his signature distinctly says that the timber was used in the culvert. I presume he would not sign a document in which it is distinctly stated that the timber was so used unless he were convinced that that was the case.

10243. Look at voucher 323—you will see that Isles is paid for carting two kegs of powder and fuse to the Five Dock quarry—is that properly charged against the Monier culvert? You will find an item of £1 in that voucher for the carting of goods to the culvert. We took only £1 out of that voucher. The signatures of Mr. Symonds and Mr. Smith also appear upon it in endorsement of what I say.

10244. As to the Ormond-street culvert do you know the reason why it was not carried out? I know that Mr. Symonds and Mr. Smith had an argument. I remember Mr. Symonds saying that he could not possibly spare the money.

10245. It was not that they could not put in a Monier culvert in that position? No, as far as I can remember it was a simple question, of funds. Mr. Symonds objected, and in that case it went before Mr. Hickson to apply to the Minister for funds, but he apparently did not think that a prudent course.

- T. W. Bryant. 10246. Do you not know that the Commissioner for Roads, under the Main Roads Act, has the sole management of the funds for the roads? I remember being asked to see Mr. Carroll and to ascertain if it would not be possible to get some money advanced from the advance vote, and I recollect his saying that the vote was exhausted.
10247. You do not know, however, that the vote was exhausted at that particular time? No.
10248. *Mr. Gummow.*] Is there a voucher among those to which you have referred for £2 5s. royalty to Carter, Gummow and Co.? No. The papers attached to the Callan Park work show that a royalty was approved by Mr. Scarr.
10249. Is there a receipt for it? I only saw the papers. Whether the amount was paid or not, I do not know.
10250. *His Honor.*] You say you have gone through all these vouchers again? Yes.
10251. Can you discover any error of any kind in your calculation? No; they are correct. There is no getting away from Mr. Smith's certificate in each case. I see from the evening newspapers that he said that he had supervised the work. I know that he handed over the work to Mr. Symonds, senior, and Mr. Symonds, senior, paid the wages; and I have never known Mr. Symonds, senior, to sign a voucher until he was distinctly aware of the nature of the service which had been performed. If he signed these vouchers for wages in connection with the Monier culvert, you may be sure that he was in possession of facts which justified him in doing so. He must have been clearly satisfied that the work had been performed upon the culvert.
10252. With regard to Mr. Bramston's salary for supervision? I am positive that Mr. Symonds must have been satisfied that Mr. Bramston was there all the time. That would appear to be the case in these vouchers, which are also signed by Mr. W. A. Smith as being correct. As the work was one which Mr. Smith considered was being carried out economically, I do not think he would sign for any money unless he was satisfied that it was expended in connection with the work. The vouchers for June and July contain amounts for £15 12s. each for Mr. Bramston's wages or salary, and Mr. Smith certifies that the amount is correct.
10253. Mr. Smith made a deduction of a considerable number of days upon which he said Mr. Bramston was not employed upon this culvert? I should like to know how he arrived at the information.
10254. That is a matter which you do not understand;—you simply take the vouchers as they stand? Yes.
10255. *Mr. Norrie.*] Do you know whether Mr. Bramston did or did not at this period supervise several other works? I cannot say as to that, but Mr. Smith, by his signature, certifies that the voucher is correct.
10256. If Mr. Bramston had been employed upon several other works at the same time, would his salary be split up into several vouchers? That could be done.
10257. But is it the practice;—you had charge of the financial part of the works, you say, and I want you to tell us what was done? The practice would depend upon whether we had the money. In some cases where we have not the necessary money to finance a work the vouchers are split up and are charged to several votes.
10258. Who prepared these vouchers? Mr. Benson, of Parramatta.
10259. He is in the office? He would be going backwards and forwards. Mr. Symonds would be responsible for each amount.
10260. Is it not possible that Mr. Benson may, as a matter of convenience, knowing that Mr. Bramston was engaged upon other works in the district, have put the whole of the amounts into one voucher instead of making up vouchers for the number of days work in connection with eight, ten, or a dozen contracts;—is it not the practice to make up only one voucher;—has it not been done repeatedly in other cases? I could not say. I know that as far as Mr. Symonds is concerned, he never did so. He never put his name to a voucher in connection with any work unless he was satisfied that the claimant had performed the work.
10261. But you have done so, have you not? Under Mr. Smith's instructions.
10262. Mr. Smith was carrying out this work? No. Mr. Symonds, senior.
10263. I thought you said that Mr. W. A. Smith supervised Mr. Symonds, senior? That is as far as the district is concerned.
10264. Did Mr. Symonds, senior, pay daily visits to the work? He would be riding backwards and forwards, I suppose.
10265. He would know whether Mr. Bramston was supervising the work? He must have been satisfied that the work was performed by Mr. Bramston or he would not have signed the voucher. He has never been known by the Department to deviate from the actual facts in any case of the kind. He must have been in possession of the facts before he put his name to the voucher. Besides, Mr. Smith endorsed it as being correct.
10266. *Mr. Davis.*] Surely Mr. Smith, as the supervising engineer, would have some knowledge as to where Mr. Bramston was engaged from day to day? Sometimes Mr. Smith would be away at Gosford or Wollombi for a fortnight at a time.
10267. But he would not be away for two or three months? No.
10268. *His Honor.*] Sometimes, I suppose, Mr. Symonds would be up beyond Penrith in that part of his district? Yes; he would be going backwards and forwards on the road.
10269. Did the son act as *locum tenens* for his father? No; Mr. Smith had him in his office in Sydney.
10270. If Mr. Symonds, senior, were away upon another part of the road, who would be looking after this work? Mr. Symonds, junior.
10271. Would Mr. Symonds, senior, give notice that he would be away? Mr. Symonds, junior, would be living with him in Parramatta, and would always know his father's movements.
10272. *Mr. Davis.*] Is it not a fact that Mr. Symonds, junior, was not working immediately under Mr. Symonds, senior, and had nothing whatever to do with his father;—did he not, in point of fact, carry out this work immediately under Mr. Smith, without reference to his father? No. The vouchers show that Mr. Smith's instructions to Mr. Symonds, junior, were to write out the vouchers and take them to his father. He said that he would endorse them afterwards.
10273. But that does not refer to the work; it refers to the vouchers? I do not know what arrangement there may have been between Mr. Symonds, senior, and Mr. Symonds, junior. There may have been some verbal understanding; but we regarded Mr. Symonds, junior, as operating from our office for the time being.

10274. Immediately under Mr. Smith? I should say that in this work he did a portion under Mr. Smith and a portion under his father. T. W. Bryant.

10275. If Mr. Symonds, senior, said that he did not supervise this work himself, what would you say as to that? I could not speak definitely as to the supervision of the work. That would be dragging me out of the office. 22 July, 1896.

10276. Has not Mr. Symonds, senior, said in his evidence that he was at the works twice a week, and is not that rather different from what you thought to be the case? I thought he would be going backwards and forwards; I could not say that he would be always on the work. My work was in the office. I heard the arguments which took place as to this particular culvert when the men came there.

10277. I suppose the visits Mr. Symonds paid to the work would be casual visits upon his ordinary rounds;—there would be other matters which he would have to look after at the same time? Probably.

Joseph Davis recalled and further examined:—

10278. *Mr. Norrie.*] Will you tell His Honor the reason for the material, to the extent of £11 ls., going to Bondi? There was a culvert over the Old South Head Road which required to be repaired. I was instructed to do the necessary work by day labour. We had no plant, and I arranged with Carter, Gummow, & Co., who were doing work at North Shore, to lend us what we required in the way of plant. They were the nearest contractors to the culvert in question, and, when the plant was being carted across to the culvert, we got with it a small quantity of cement. The cartage charged for is principally the cartage of plant from North Shore to Bondi, and from Bondi back to the contractors' works at North Shore. That is the whole explanation of the matter. It was a convenience to get the plant from these contractors, and it was also a matter of convenience to get approved cement. J. Davis. 22 July, 1896.

10279. Would you vouch for the correctness of the inspector's returns of cement which Mr. Parkes has asked for in regard to Contracts 69, 79, and 79 A? I should say they would be only approximate, and for this reason: It is usual on contracts like 69, 79, and also 79 A, to some extent, where concrete and brickwork is being carried out, to have one principal inspector. The brickwork and concrete may be going on in five or six places at the same time; that is, on different parts of the contract; and the custom of the Department has been to station at these five or six places sub-inspectors or overseers. They would keep an account of the cement that is used, and hand it to the principal inspector in the evening. He then makes up the return, so that you could scarcely make one man responsible for it, although, as a matter of fact, one man makes it up. The man who attaches his name to the return is nominally responsible for it, but I should not like to make him responsible for the accuracy of it, and for that reason I should not like to say that in every case the return was accurate. I should prefer to call it an approximation.

10280. You have to depend to some extent upon your overseers? Precisely. We have to depend entirely upon them in this matter.

10281. *His Honor.*] You try to get reliable men for those positions? We believe we have reliable men. I do not believe they would make false returns. Everyone is liable to make mistakes. We find that even Mr. Christie is liable to do that.

FRIDAY, 24 JULY, 1896.

George McCredie recalled and further examined:—

10282. *Mr. Parkes.*] You have made a report in conjunction with Mr. Thompson concerning your tests as to the quantity of cement contained in concrete of various descriptions as provided by the specifications on Contracts 79, 79A, and 69? Yes; it is as follows:— G. McCredie. 24 July, 1896.

Varney Parkes, Esq., M.L.A., Public Works Inquiry Commission, Sydney.

Dear Sir,

250, Pitt-street, Sydney, 23 July, 1896.

Acting on your instructions, we have made tests as to the amount of cement required per cube yard of concrete, following the Sewerage Construction Department's specification as given in the printed papers.

In making the tests we used three boxes each, 4 ft. 6 in. by 4 ft. by 1 ft. 6 in. deep, holding, when full, 1 cube yard, and for the purpose of gauging a box 4 ft. by 12 in. by 12 in. The broken stone was first tested as to gauge, then roughly washed, as specified, and forked into the 4-ft. gauge-box, and from thence deposited on to a hardwood platform, then we added the proportionate quantities of sand and cement, and the whole was turned over twice dry and twice wet, and deposited in the boxes before mentioned.

We may state that these tests were made in the presence of Messrs. A. L. McCredie and Geo. Donald, in addition to ourselves, and every dimension and proportion were carefully checked by each.

The mixing was done by two expert labourers, the whole of the operations being carried out under our joint supervision.

*First—Sandstone Concrete.*—Proportions specified, 1 cement, 2 sand, 5 stone, 2-inch in gauge. For this test we used the following quantities:—Half a cubic yard of stone, 5·4 cubic feet of sand, and ·675 of a cask of cement. These quantities, when placed in the large box, made only half a cubic yard of concrete, showing the total disappearance of the cement and sand. Upon being subjected to a moderate ramming, as specified, this half a cubic yard sank half an inch, or a total actual shrinkage of one-eighteenth in bulk, thus showing that in concrete of these proportions the interstices must be considerable.

*Second—Blue-metal Concrete.*—Proportions specified, 1 cement, 2 sand, 4 stone, 1½ gauge. The quantities we used in making this test were as follows:—Half a cubic yard of stone, 6·75 cubic feet of sand, and ·843 of a cask of cement, which when being placed in the large box only filled it to a depth of nine inches, showing, as in the case of the sandstone concrete, that the sand and cement disappeared, and on being rammed moderately, as per specification, it further sank a quarter of an inch, thus resulting in a decrease in bulk of one thirty-sixth.

*Third—Special Bluestone Concrete.*—Proportions specified, 2 cement, 3 sand, 7 stone, ¾ inch metal. The quantities we used in making this test were as follows:—A quarter cubic yard of metal, 2·89 cubic feet of sand, and ·48 of a cask of cement. This was deposited in half the space of one of the above boxes, and upon being rammed, as specified, showed an increase in height of half an inch, equal to an increase in bulk of one-eighteenth, showing that in this class of concrete alone did the sand and cement add to the bulk of the metal.

We may add that every 9 inches in the height of the concrete was specified to be washed and grouted with a liquid grout of one of cement to two of sand, and this would absorb a considerable quantity of cement which we have not taken into consideration, nor the ½-inch cement collar-joints, which would also take a fair amount of cement.

We would point out that in the whole of the contracts which we have dealt with there is only 161 cubic yards of special bluestone concrete have been used, and our tests, therefore, would incline us to deduct sixteen casks from our former returns; but, on the other hand, a much larger number would have to be added for the shrinkage in the other concrete.

We are, &c.,

GEORGE MCCREDIE.  
W. THOMPSON.

G. McCredie. 10283. You have also a memorandum showing the advantage gained by the contractors, Messrs. Carter, Gummow, & Co, upon the rearrangement of their schedule prices after their tender had been signed and their Contract 79 had been entered upon—I refer to the rearrangement made at the request of the contractors and with the consent of the departmental officers? Yes; I have made a report in conjunction with Mr. Thompson, which is as follows:—

Varney Parkes, Esq., M.L.A., Public Works Inquiry Commission,—

Dear Sir,

250, Pitt-street, Sydney, 23 July, 1896.

We have carefully gone through the schedule and final voucher in connection with Contract No. 79, and have the honor to report as follows:—

*Item No. 1.*—In this item the schedule quantities give 800 cubic yards of "excavation in tunnel guttering and gadding," and the final voucher has 21·22 cubic yards, showing a deduction of 778·78 cubic yards, which latter quantity was allowed to be carried out as excavation with 4-inch powder, at a merely nominal reduction in cost of 3s. per cubic yard, as per schedule, whereas the proper difference in value would have been 17s. per cubic yard, thus the alteration benefited the contractors by 14s. per cubic yard, amounting to £545 2s. 11d.

Had the above-mentioned 778·78 cubic yards been carried out by guttering and gadding, we would point out that the contractor would have had a loss of 9s. per cubic yard, which would have amounted to £350 9s., based on the Department's estimate of 72s. per cubic yard.

*Item No. 5.*—The schedule quantities give 361 cubic yards of guttering and gadding in shafts, while the final return shows that excavation with 4-inch powder was substituted, which would give the contractor an increased profit of 5s. per cubic yard, amounting to £90 5s.

*Item No. 17.*—In this item there is an increase of 852·17 cubic yards of sandstone concrete in the final return over the quantity shown in the schedule, which would result in the contractor gaining a profit of 7s. 6d. per cubic yard, amounting to £319 11s. 3d., the Government estimate being 30s. per cubic yard.

*Items Nos. 10 to 15 (inclusive).*—For these items the contractor only allows £3 4s. 2d., while a fair cost would amount to £238 15s., and as they were not carried out, the contractor was saved a loss of £235 10s. 10d.

*Item No. 20.*—This item, 180 cubic yards of brickwork, the contract rate for which was 20s. per cubic yard, or £180, was omitted, whereas the Department's estimated value is 60s. per cubic yard, and which, if it had been carried out, would have resulted in a loss to the contractor of £360.

We may point out that in Item No. 4 the schedule quantities give 75 cubic yards excavation in road surfaces, whereas the quantity paid for was 541·77 cubic yards, and as the contractor's price was 78s. per cubic yard, against the Department's estimated value of 6s. per cubic yard, this increase gave the contractor an additional profit of £1,680 7s. 5d.

We are, &c.,

GEORGE M'CREDIE,  
W. THOMPSON.

William Thompson recalled and further examined:—

W. Thompson. 10284. *Mr. Parkes.*] You have heard the reports which Mr. M'Creddie has just read? Yes.  
10285. They are reports which you have made in conjunction with him, and you concur in them in every particular? Yes.

FRIDAY, 31 JULY, 1896.

William Scarlett Delisle Roberts recalled and further examined:—

W. S. D. Roberts. 10286. *Mr. Parkes.*] Will you refer to a test recorded in your cement test-book under date of 24th September, 1895? There are two tests of that date.  
10287. One is a test of cement for Contract No. 118? Yes; for Carter & Co.—500 casks.  
10288. There is also a test under date of 27th September, is there not? Yes; for sewerage Contract No. 118—Carter, Gummow, & Co., 2,000 casks.  
10289. Under date 21st November there is a further test for Contract 118? Yes; for Carter, Gummow, & Co.—1,200 casks.  
10290. The next test you come to is that of John Try's cement, which was in bags, and which was condemned? Yes; it was submitted in connection with Contract 118. The test is dated 5th December. 1,360 bags were tested for Carter, Gummow, & Co.  
10291. It did not pass the test? No.  
10292. And from that time out John Try's cement did not pass? I think that was the last.  
10293. Therefore there is no chance of there having been good cement of John Try's in bags on that contract? There may have been a good deal stored there before that.  
10294. Will you turn up your book and see if you can find any record of passed cement of John Try's in connection with that contract? I see there is a test dated 20th September, 1895; 700 bags were tested for Carter & Co. in connection with Contract 118. That evidently passed the test.  
10295. Will you pass to the next one? The next is a test of the 17th October.  
10296. How many bags would there be in that case? 1,360.  
10297. That was condemned? It was either condemned or tested again.  
10298. How many bags go to the cask? About three.  
10299. Then the 700 bags which were passed would equal 233 casks? Yes.  
10300. There can be no doubt from your book that the cement of John Try's upon Contract 118 from November up to January had not passed? There seems to be not much doubt about it.  
10301. When you were here on the last occasion you gave us particulars of some tests which had taken place in connection with the North Shore sand? Yes.  
10302. I think you said that the sand exceeded the standard adopted by the Department—do not the sheets I hand you represent your tests? They are evidently the tests.  
10303. Will you read the results, beginning with the first test? Yes. The coefficient for tensile strain in test No. 56 was 117·0, the standard being 100; the coefficient for crushing strain was 110·7, the standard again being 100; the loss of weight by washing was 2·8 per cent.; the weight per cubic foot was 106·1; the dosage was 3·2. The residue on a sieve of 400 meshes to the square inch was 11·72; and, on a sieve of 900 meshes per square inch, 16·41. The residue on a sieve of 2,400 meshes was 57·03; and there passed through the 2,400 sieve 14·84.  
10304. Only 14 per cent. passed through the 2,400 sieve? Yes.  
10305. Will you now read the second test? Yes. The test I have just read is that of a sample of sand obtained from crushed sandstone from rock on the property of the North Sydney Gas Company. The test I am now about to read is headed "Sample of sand obtained from quarry near Gas Works, North Sydney." The coefficient for tensile strain was 117·0; the coefficient for crushing strain was 113·0; the loss



loss of weight by washing was 5·3 per cent. There was not sufficient sand to permit of the weight per cubic foot and dosage being given. The residue on a sieve of 400 meshes was 15·22 per cent.; on a sieve of 900 meshes, 13·04; and on the 2,400-sieve, 57·61. There passed through the 2,400-sieve 14·13.

10306. Will you now read Mr. Hickson's minute on the back of the test you first read? Yes; it is as follows:—"On condition that the sand is sifted as done by Mr. Roberts, I recommend that the sand be allowed to be used."

10307. Sifted through what sort of a sieve? There is a note on the test to the effect that the co-efficient for tensile strain, 117·0, was arrived at by sifting the sand through a No. 12 sieve.

10308. That does not show an exceptionally good quality of sand? I do not think you will get a much better quality anywhere as far as these tests are concerned.

10309. What has been the result of your tests so far as the Nepean sand goes? I have not, the tests here, but I do not think they go so high.

10310. Had it not exceeded the standard to a greater extent than has this sand? I do not think the co-efficient for tensile strain has gone so high as 117·0. More cement would be required to fill up the interstitial spaces.

10311. Have you a record of your tests of passed Nepean sand? Yes.

10312. After you have tested cement, beside making a record in your test-book, you also issue a certificate such as that which I now hand you? Yes.

10313. It is first of all submitted to you by the engineer-in-charge, and it records the number of casks on the job? Yes; and gives other particulars.

10314. Every bit of cement which is tested is represented by a certificate such as that which you have in your hand? A certificate is always given.

10315. First of all it is noted by the engineer-in-charge of the work, then by the engineer-in-charge at the office, and then by the Engineer-in-Chief; is not that so? I know nothing, except that I give a copy of the certificate from my book. The matter goes out of my hands then.

10316. Is not what I say recorded upon the face of that document? After I sign these documents they are sent away and signed by the Engineer-in-Chief as passed or rejected.

10317. These documents record all the cement which goes on to a job? Yes.

10318. So that if the documents I hand you are the records in connection with Contracts 79, 79A, and 69, they would record all the cement which has been stored on those jobs? They should be records of all the cement.

10319. If they correspond with your test books they should be correct? They should be correct if they correspond with the books.

10320. *Mr. Davis.*] Referring to the tests you made of John Try's cement on September 24th, 1895, that cement appears to have passed the test? Yes.

10321. But you do not know when that cement was used? I have no knowledge whatever of what was done with the cement.

10322. It may have been used in the year 1896 for all you know? It may have been used anywhere.

10323. You may remember that at the time you made the sand test No. 56, which purports to be a test of crushed sandstone from rock on the property of the North Sydney Gas Company, I took exception to your treating the sand differently from the way in which it would be treated on the works? I recollect some conversation of that kind.

10324. Do you not think that that was probably the reason why I and not Mr. Hickson, as Mr. Parkes said, wrote the minute which you read just now? Yes.

10325. The sand had passed the test in the way you had treated it, and I recommended that if the sand was seived in that way it should be used? Yes.

10326. The same thing arose in connection with sand test No. 54, which purported to be a test of sand from the same position. I asked in my minute whether the sand was tested as it was received and you then wrote this minute: "This test was made in the old way—that is the crushing strength with the sand as received and the tensile strength sifted through the 400-seive. After this test all tensile tests will be with sand sifted through the 144-seive as agreed upon last week"? Yes.

10327. Then I wrote: "This being the case, another sample of sand had better be forwarded for testing";—can you explain why that was written? Yes; in order, I suppose, to conform to the new regulation.

10328. My object was to get the sand tested just as it would be used on the works? Yes.

10329. And not as it would be used by you in the cement-testing room? Quite so.

10330. *Mr. Parkes.*] The minute by Mr. Davis to this effect: "On condition that the sand is sifted, as done by Mr. Roberts, I recommend that the sand be allowed to be used,"—had the approval of Mr. Hickson? Yes.

10331. Therefore there was a departmental approval? Yes.

George M'Credie recalled and further examined:—

10332. *Mr. Parkes.*] Have you anything further you wish to say concerning the report you presented to the Commission on the 24th instant with regard to the cement tests, and also with regard to the advantages given to the contractors by the rearrangement of the schedule of Contract 79? Yes.

10333. In making out the calculation, which showed that an advantage of something like £3,500 had been given to the contractors by the rearrangement of their schedule, you took as your basis the departmental estimate? Yes.

10334. That is, you did not make a calculation from your knowledge of trade prices—you simply took the information which the Government themselves had afforded? Yes; we took the office estimate which appeared upon page 339 of the Parliamentary return. You handed to us Mr. Owen's evidence to guide us as to cost per yard of tunnelling, &c., and we found, on working it out, that it ran out at 39s., but we put it down at 46s. We allowed 46s. per cubic yard for excavation—that is, for tunnelling—guttering and gadding.

10335. You see no reason to alter your figures? No.

10336. You feel convinced that they are right? Yes; they are based upon the estimates of the Department. The report speaks for itself.

10337.

W. S. D.  
Roberts.

31 July, 1896.

G. M'Credie.

31 July, 1896.



G. McCredie. 10337. If you were an engineer drawing an equitable arrangement as between the Government and contractors this is what you would advocate? Yes.

31 July, 1896. 10338. You have prepared a further report concerning the cement which should have been used if the specification had been carried out even approximately in connection with Contracts 79, 79A, and 69? Yes. 10339. When you were here you only took the cement which appeared in the yard bulk, but there were certain other things, such as grouting, and also shrinkage, which you did not allow for? Yes. 10340. Will you tell the Commission what further light your investigations have thrown upon the matter? Yes; I have made a supplementary report, which I will now read:—

Varney Parkes, Esq., M.L.A., Public Works Inquiry Commission, Sydney,—

Dear Sir,

250, Pitt-street, Sydney, 30 July, 1896.

Following on our report of the 23rd instant, we have made further calculations of the quantities of cement required in connection with Contracts Nos. 69, 72, 77, 79, 79A, and 118, in order to allow for grouting and shrinkage in the concrete, and now have the honor to report as follows:—

First—*Grouting*:—Proportions specified, 1 cement to 2 sand. In testing the grout we used one-third of a cubic foot of cement and two-thirds of a cubic foot of sand, which proved to be sufficient for one cubic yard of cement.

This quantity is equal to one-twelfth of a cask of cement, but, even allowing that one-twenty-fourth of a cask, or one-half the quantity we used, would be sufficient, it would require 486 casks for grouting in Contracts Nos. 69, 79, and 79A, and 636 casks for the remaining contracts, in addition to the number of casks given in our returns of the 6th instant.

Second—*Sandstone Concrete*:—Our tests having shown a shrinkage of one-eighteenth, as previously reported in ours of the 23rd instant, it will necessitate our adding 274 casks to the number returned for Contracts Nos. 69, 79, and 79A, and 1,135 casks to the number for the other contracts.

Third—*Bluemetal Concrete*:—The shrinkage in this concrete being one-thirty-sixth, we have to add 367 casks to the number returned for Contracts Nos. 69, 79, and 79A, and 6 casks for the other contracts.

The following are the returns as corrected to allow for the shrinkage of concrete, grouting, &c.

Contracts Nos. 69, 79, and 79A:—

|   |               |
|---|---------------|
| Former return .....                           | 21,612 casks. |
| Add for grouting .....                        | 486 "         |
| Add for shrinkage in sandstone concrete ..... | 274 "         |
| Add for shrinkage in bluemetal concrete ..... | 367 "         |

22,739 "

Deduct for expansion in special bluestone concrete in Contract No. 79.....

17 "

Total number of casks .....

22,722 "

Contracts Nos. 72, 77, and 118:—

|   |          |
|---|----------|
| Former return .....                           | 23,616 " |
| Add for grouting .....                        | 636 "    |
| Add for shrinkage in sandstone concrete ..... | 1,135 "  |
| Add for shrinkage in bluemetal concrete ..... | 6 "      |

Total number of casks required .....

25,393 "

Contracts Nos. 69, 79, and 79A .....

22,722 "

Contracts Nos. 72, 77, and 118 .....

25,393 "

Total.....

48,115 "

Yours, &c.,

GEORGE MCCREDIE.  
W. THOMPSON.

10341. Your conclusions are drawn from practical tests made in a liberal fashion? Yes.

10342. You have not gone to any excessive length to make things eke out as much as you could? No; we have been liberal in every way.

10343. Your report is in accordance with what you consider the nature of the work in hand? It is.

10344. If properly carried out? Yes.

10345. What were the figures you gave as to the cement to be used in Contracts 79, 79A, and 69? The total is 22,722 casks.

10346. And that does not include what are called collar-joints? No; I did not take that into consideration.

10347. That would take a great deal more cement? A good deal.

10348. It did not include the surplus which would have to go in the way of packing owing to the irregularities of the rock? No.

10349. Nor did it include any waste arising from the rendering of the soffit of the arch of the tunnel? No.

10350. You have prepared a second report with regard to your experience as to the quantity of cement which a cask holds in relation to a cube foot? I have no report upon the matter, but I can give you the particulars.

10351. You have made tests? Yes.

10352. With what result? The tests were made with Goodlet and Smith's Rock Brand cement, a cask of which weighs 378 lb. net, and contains exactly 4 cubic feet of cement, as measured in our gauge-box.

10353. What does the imported cement measure? It measures a little more—about 4½ cubic feet.

10354. In the trade a cask of cement is generally taken to be equal to 4 feet? We generally take it at 4 feet. We were in the habit, at one time, of taking six casks of cement to a yard, but the specification of the Department shows 4 cubic feet to a cask.

10355. What has been your own experience? It goes about 4 cubic feet.

10356. That applies to every description of cement, whether of a fine or coarse texture? It is all about the same. There is not a great deal of difference. Sometimes it goes a third of a foot over and sometimes a sixth of a foot over.

10357. Does it ever exceed a third of a foot? I do not know. There is a good deal of difference in the weight and measurement of casks of cement—in the imported ones especially. We have worked entirely upon the specification. In Contracts Nos. 69, 79, and 79A, the weight required by the specification is 387 lb., and this weight must be made up by an increased quantity of the cement. Therefore, it would in the case of these contracts be necessary to add to every cask of Rock Brand cement one forty-second part of a cask to bring it up to the required weight. Presuming that full-weight casks were used, it would require 541 casks less of cement for these contracts, but with regard to the other contracts the cement is specified to weigh not less than 374 lb. per cask net, so that no alteration is necessary in the returns

returns previously sent in. The specification is most distinct as regards the weight of the cement, so that there can be no misunderstanding on the point. G. M'Creddie.

10358. With reference to the question of the shrinkage of cement, I asked you to go out and look at the condition of Contract 101, which is a concrete construction, and I should like to know the result of your investigation? I went out and had a look at the work on two occasions, and as far as I can see the work from the manner in which it is constructed will not stand. The structure from end to end is, I should say, in a state of collapse. There are cracks about every 13 or 14 feet. It is not in use, and as far as I can see is not likely to be used, unless something is done to it, involving the expenditure of a great deal of money. 31 July, 1896.

10359. Do you consider the cracks in the structure are of a serious nature? I do, certainly.

10360. Do you think they are capable of being repaired so that the structure would hold water? I think the best thing to do would be to take off the whole of the top structure down to the table and put in iron pipes. That is my opinion.

10361. By the table you mean the top of the arches? Yes. I do not think that any repairing would make a permanent job of it. Bolted iron plates might be put right along, but that would involve great expense.

10362. Is there any water running through the carrier? Very little water at the present time. Some water appears to have been running through, because the carriers are marked all the way along, showing where the water has been running.

10363. With regard to the porosity of cement—do you think that this structure tends to establish the fact that cement will hold water? My opinion is that it will not hold water. What I saw the other day confirms me in my belief that concrete and cement are not fit substances to carry sewerage matter.

10364. Is there any leakage from the carriers in Contracts 64 and 101? Yes. Nearly every pier is cracked in the middle. The water is running through from the springing of the arches right down the face of the piers. Upon the haunches all the way along there are signs of leakage.

10365. Is the leakage of an uniform nature over the soffit of the arch? Yes; it is pretty well over the soffit of the arch, coming down through the joint of the brickwork. The face of the brickwork is in fair order. The only places where the water is coming down is in the joints of the stone course on the top, where it comes against the brickwork. Down the haunches of the arches, below the brickwork, it seems to have been leaking pretty badly. Almost every pier along the centre shows either a crack or a sign of leakage such as you would see before a crack takes place.

10366. What would be the result of sewage matter running through the carriers—do you think it would saturate the work? Yes, I should think so.

10367. Would not that be a menace to health? I should say it certainly would.

10368. What is the length of the aqueduct in Contract No. 101? It is about 25 chains in length.

10369. What do you think would be the cost of repairing that length of aqueduct? It depends entirely upon how it is repaired. The best way to make a permanent job of it would be to take the whole of the top structure off and to run iron pipes along. You could not tell what it would cost unless you went into it very carefully. I should think it would take from £20,000 to £30,000 to make a good job of it.

10370. In the face of experience like this, do you not think it is a very grave thing for the Department to still proceed with these cement structures? Yes. I do not think it is a wise thing to have cement structures at all for sewerage works.

10371. Do you think the cement structure in Contract 77 will hold water? As I said when I gave my evidence before, I have not had any experience of Monier structures, but I do not think it will hold water. I think the Department will have trouble with that work similar to that which they have had in connection with Contract 101. I do not think it will serve the purpose.

10372. Do you think the iron in No. 77 will prevent the structure from cracking? My own opinion is that the thinness on the side of the carrier in Contract 77 is a source of very great weakness. I do not think the iron will prevent the structure from cracking.

10373. Would not the iron, being in 4-inch mesh-work, be likely to make the cracks more numerous? Experience only can show us that. My own opinion is that it would be a source of weakness to the structure. I think, considering the thinness of the side of the carrier, that, so far as the iron grid is concerned, it is more likely to crack with it than without it. Once the work begins to crack and open up, as cement generally does, the iron would receive the effect of the weather, and the damage would be very extensive then. What I have seen in connection with Contract 101 only bears out what men who have to do with the practical carrying out of this class of work have always said—that is, that concrete and cement always show cracks at distances of from 12 to 14 feet apart.

10374. Once cement or concrete cracks, is it, judging from your experience, possible to repair it? If you go out to Contract 101 you will see the results of repairing the cracks. In some cases there the cracks have been cut out to a width of about 3 inches, and have been filled in with pretty good cement—probably neat cement—but they are already opening again. It is almost impossible to get the old and new joints to come together and make a compact job.

10375. Running all along the aqueduct from end to end, about halfway down the work, there are cracks? Yes. The cracks run right along. When I first saw it I thought it was due to the water line—that it was probably the water level inside the carrier, and that the water had run out through the concrete. I was under the impression that the water had come out at the junction of the sandstone with the bluestone concrete, but after looking at the plan I find that the bluestone concrete is carried right up to the top. The sandstone concrete is merely over the crown.

10376. It is practically the springing of the arch? Yes. And you must remember that, according to the plan, there are at the side of the carriers 16 inches of solid material.

10377. Would you, as an engineer, venture upon a cement structure of this nature? Not above ground.

10378. Do you know of any other engineer in the city who would do so? I do not know whether the others are of the same opinion as myself? I am speaking now from my own experience.

10379. Have you noticed that other engineers and architects avoid cement structures? They do not generally go in for concrete and cement structures above ground.

10380. When using concrete even underground you always put T rails through it? Yes; when I have used concrete underground for foundations I have put old railway irons in and bolted them together at every junction.

10381.

- G. M'Credie. 10381. Is not that done because the concrete cracks even there? Yes; it is done to keep it from parting at certain points.
- 31 July, 1896. 10382-3. Speaking as an engineer of some experience, what is your opinion of the work you saw upon Contract No. 101? My opinion is that if the job is to be made a serviceable one the top would have to be cleared away. If you were to start repairing it you would have to be continually repairing it from end to end. I am quite satisfied that any practical man of experience would endorse that opinion.
10384. *Mr. Davis.*] I want you first of all to look at the report which you made to the Commission on the 24th July, with respect to the schedule and final vouchers in connection with Contract 79. Look at paragraph 1, item 1. You assume, I suppose, that the specification provides for 800 yards of excavation to be done by means of guttering and gadding? Yes. That is the quantity mentioned.
10385. Will you turn up the specification and show his Honor where 800 cubic yards are specified to be carried out by guttering and gadding? You will see from our report that we have gone carefully through the schedules and final vouchers.
10386. Then you do not say that this quantity is specified to be carried out? What I say is this—"We have taken the final voucher for Contract 79, and we were asked to compare the schedule quantities with it."
10387. Am I to assume that your report is based not upon the specification but on the final statement of the quantities compared with the schedule? Yes; that is distinctly stated in the report.
10388. Without reference to the specification at all? Without reference to the specification.
10389. You notice the printed words at the head of the quantities? Yes, "probable quantities."
10390. Will you also read the note at the head of the schedule? Yes; it says, "The quantities in this schedule are not guaranteed as correct, but are merely given for the guidance of intending contractors, this being a schedule of prices current."
10391. Would you understand, taking that note in conjunction with the heading "probable quantity," that the quantities were variable or not? I understand that these quantities are variable.
10392. You have assumed in your report that they are not variable? I have not assumed anything. I have simply carried out the instructions of Mr. Parkes to compare the schedule quantities and prices with the final voucher.
10393. You say in your report, "In this item the schedule quantities give 800 cubic yards of excavation in tunnel-guttering and gadding," and the final voucher has 21.22 cubic yards, showing a deduction of 778.78 cubic yards, which latter quantity was allowed to be carried out as excavation with 4-inch powder at a merely nominal reduction in cost of 3s. per cubic yard as per schedule? Yes, that is the schedule price.
10394. You say that the proper difference in value would have been 17s. per cubic yard—how do you arrive at that? In two ways. In your estimate you make the difference 17s.;—there is 55s. against the 4-in. powder, and 72s. against the first item.
10395. Does that refer to Contract 79? Yes; I take it from the papers that that is so.
10396. *His Honor.*] Having looked at the papers, you think you must have made a mistake in assuming that the prices appearing upon page 339 of the Parliamentary papers were the office estimates for Contract 79? I was under the impression that they were.
10397. But, having looked at the papers, you conclude that there is possibly a mistake? Yes, possibly.
10398. *Mr. Parkes.*] You would like to look further into the papers to make sure of the point? Yes.
10399. *His Honor.*] After looking at the portion of Contract 64 which you saw the other day, I suppose you did come to the conclusion that the dark stains along the face of the work upon Contract 101 were really due to the percolation, not of sewage from the carriers, but of water that had passed over the asphalt and through the joint between the asphalt and the line of cemented concrete on the top? My opinion is that if the asphalt coloured the leakage it would have coloured it from the top, but it is in a straight line right along some distance below.
10400. But, as far as the staining is concerned, comparing the two contracts, do you not think that the peculiar colour might be due to the percolation of water between the asphalt and the concrete? It may be so. The water would have to go down through the concrete to get out. What I wanted to say just now was this,—that if the water had gone over the edge you would have seen it from the edge downwards, but the discolouration appears about a couple of feet below the surface of the asphalt. This discolouration could not have been caused by sewage matter, because the carriers have not been in use. It is quite possible that the asphalt might have discoloured the water, but it would have to go down through the concrete in order to get out where the stains appear.
10401. *Mr. Davis.*] As to Contract 101—from what cause would you say the structure had been cracked? I could not see any settlement in the piers, and I take it that it would be from the expansion and contraction of the material. I believe good blue-metal concrete may have been used. The work appears on the surface to have been well carried out as regards the material, but it is certainly cracked along the arches right through. There was only one arch in which I noticed a settlement, and that was towards the end near the junction with 112.
10402. You think there has been a settlement there? Yes.
10403. Do you think the cracks are due not to inferior workmanship but simply to changes of temperature setting up expansion and contraction? I am not in a position to say whether the material in the job is good or not, but it appears on the surface to be good. I think the cracks are due to the expansion and contraction in the material itself.
10404. From your experience you must know how difficult it is to control that? I know how difficult it is to control any work like it.
10405. You question whether it was wise policy to put up a structure of that description at all? Yes; my own opinion is that it is not wise to build these structures of concrete.
10405. Have you examined the plans of No. 101? Yes.
10407. Did you notice that provision was made for covering up the sewer? Yes. I noticed that there is an embankment for covering up the sewer.
10408. Supposing the embankment were put along the sewer, what effect would it have upon the expansion and contraction of the concrete in the aqueduct—would it stop it or otherwise? It would have this effect, that you would not see the cracks.
10409. Did you not say that concrete below ground would not contract and expand? No; what I said was that we often put iron in it on account of its contracting and expanding.
10410. Below ground? Yes.
- 10411.

10411. Will you explain what causes concrete to expand and contract? As far as the material itself is concerned, heat and cold will generally cause expansion and contraction. The material always seems to contract and expand so as to cause cracks at distances of 10, 12, and 14, feet apart. Even in the best of concrete embankments you will see it. That is my experience. G. M'Creddie.  
31 July, 1896.

10412. Do you think that a concrete structure, covered up with a reasonable quantity of earth, would be likely to be affected by the changes of temperature that we get here in Sydney? You are assuming that the work would be covered up when it was built; but you must take this into consideration, that you may cover defective work up, and you will not be able to tell how it will act when it has been covered up once it has started to open out.

10413. I will put it in this way: would concrete expand and contract under earth? I could not tell you.

10414. Would it expand and contract to the same extent as if it were exposed? Not to the same extent, I should think.

10415. Would it expand or contract appreciably under earth? I do not think so, if it were covered up when the work was new, because we use concrete in the foundations of buildings, and have very little trouble with them. In very treacherous ground we put iron in it.

10416. You say that the only way to make Contract 101 a good job would be to take off the top portion of the aqueduct down to the level of the invert or table, and to put in pipes? Yes.

10417. What sort of pipes? Similar to those which have been used in a neighbouring contract.

10418. Did you see those pipes? Yes.

10419. What sort of pipes are they? I did not have a good look at them, but I should think that, if  $\frac{3}{4}$ -inch pipes, covered inside with a coating of cement, were used, they would last for many years.

10420. You think, I suppose, that the question of cost is an important element in deciding upon the kind of structure you are going to build? No doubt it is.

10421. Do you not think that in a structure of this description, even where the Government are concerned, the question of cost should be considered? Yes; but at the same time you have to consider durability.

10422. Supposing you get a structure which would give you the same results for 5s. that you could obtain in another structure costing 7s. 6d., which would you adopt? If they were equally substantial, I should adopt the cheaper one.

10423. With reference to the contents of a cask of cement, you said in giving evidence on 12th June before this Commission that you regarded six casks of cement to be equal to 1 cubic yard? Yes, we used always to calculate it in that way.

10424. How much would that be per cask—what would be the contents?  $4\frac{1}{2}$  feet.

10425. Making 27 cubic feet? Yes.

10426. It is not  $4\frac{1}{2}$ ? No. After giving that evidence, I drew attention to the fact that I had noticed in the specification that the contents of a cask were given at 4 feet.

10427. Were they specified to be 4 feet? They were said to be equal to 4 cubic feet.

10428. Let me refer you to page 344 of the Parliamentary Return:—"To facilitate the gauging of cement throughout the contract, cement casks will be taken as equal to holding 4 cubic feet; otherwise, the contractor to provide and make approved gauge-boxes, holding exactly 4 cubic feet, for measuring cement. Cement of a lighter weight than herein stipulated, but otherwise equal to the specified test, may be permitted to be used in the works, subject to the decision of the Engineer-in-Chief, and provided that the deficiency in weight is made up in quantity";—would you think that the portion relating to 4 cubic feet gives a specification to the effect that a cask of cement is to hold 4 cubic feet? Provided the weight is up to the standard.

10429. Is it not this—that if the contractor says, "I do not want to gauge the cements," the Department says, "If you do not, we will accept one cask of cement as 4 cubic feet"? Precisely.

10430. You based your report upon the assumption that the contractors would give a cask of cement equal to 4 cubic feet? No.

10431. Do we specify a cask of cement to be 4 cubic feet—is that so or not? You specify that a cask of cement will be taken as 4 cubic feet.

10432. Suppose a cask of cement contains  $4\frac{1}{2}$  cubic feet, more or less, and the contractor elects to gauge the cement instead of giving a cask of cement as being equal to 4 cubic feet, the contractor will make more than 4 cubic feet out of it? I have allowed for that. I have taken 500 odd casks. Besides, you have safeguarded yourselves by the provision in your specification as to weight.

10433. As to grouting, you gave in evidence that you had made an experiment as to the quantity of grouting required for a cubic yard of concrete; you say that you require a cubic foot of compo. made into grouting for that quantity of concrete; will you explain how you made the experiment? We used a third of a cubic foot of cement and two-thirds of a cubic foot of sand. We mixed it up and put it in a bucket and made it into a liquid, and we then poured it over 4 superficial yards of concrete. It turned out that that was just sufficient to do the work. It was equal to one-twelfth of a cask of cement. We allowed for this—that perhaps the contractor might not put in quite as much grouting, although we considered it a fair and reasonable quantity to put in. We cut it in halves and allowed one-twenty-fourth. We thought that would be a good safe margin.

10433 $\frac{1}{2}$ . First you put a layer of concrete, then you mixed up the grouting and poured it on the concrete? No; we had 9 inches of concrete, and we washed the surface of it, and we then grouted it as if we were going to put another layer on the top. We then measured it and gave one half of the quantity we used.

10434. Leaving out of question your opinion as to the meaning of the specification, and supposing that grouting were not to be done, would it be fair to compute the quantity of cement which would have to be used in the grouting, and to charge it against the contractors? I can only say this: if the grouting is not done the job is not a job.

10435. You say in effect that the grouting should have been done? Certainly. In all concrete work it should be done. We never put a layer on a dry joint under any circumstances. I would always grout it even in foundations.

10436. Suppose the concrete is not allowed to get hard—supposing it is quite green and sloppy—that it is as moist as compo.? Then you do not use your specifications. We must work upon something.

10437. Suppose the grouting were not used, would it be fair to charge it against the quantity of cement which should be used in the contract? Then, what you mean is, that the concrete is put in more than 9 inches deep at a time and is not rammed.

10438.

- G. M'Credie. 10438. *His Honor.*] Suppose the work follows on so quickly that, after the ramming of one layer of concrete, another layer is put on when the first layer is quite wet, when it is not set, or beginning to set, is there any necessity in common sense for the grouting—is there any use in or benefit from it? No; the concrete will be one body then.
10439. Even though the work may be done in layers? Yes; but it would be a most unusual way of doing it.
10440. *Mr. Davis.*] But there would be no necessity for grouting under those circumstances? No.
10441. And it would not be right to charge the cement for the grouting against the contract? No.
10442. You said you had had considerable experience in concrete work of this description where cement is used—would it be practicable to put in concrete in 9-inch layers in a tunnel, where most of this work has been carried out, and where the concrete is 5 inches thick? It depends entirely upon the position of the tunnel. It depends upon how you carry out the work. It may not be practicable to put the concrete 4 inches wide round the sides of a tunnel.
10443. What length of tunnel would you require to keep a moderate gang of men going, allowing every 9 inches to set before you put the next 9 inches in? If I were the contractor I would put it all in if I could manage it.
10444. Would it make the best job? It would make a solid job. But why is it supposed to be put in the way specified for that size of a tunnel?
10445. So that, if the Department, in its wisdom, thought that the best way to carry out the work, you would not take serious objections to it? I believe in this class of material being put in as quickly as possible.
10446. Let me come now to the collar-joints? I have not allowed anything for collar-joints, so that it is of no use to deal with them.
10447. You said on giving your evidence on a former occasion that you had made some experiments with brick-work, what was the thickness of the work? Nine inches, in an arch.
10448. Were the bricks laid in two rings? Yes.
10449. Was there any collar-joint between? Yes.
10450. So that in the experiment you made you included collar-joints? I do not call that a collar-joint; I call it a grouting. What I should call a collar-joint would be the joint above that before the concrete comes in.
10451. What does the specification say? It says:—"The brickwork required in lining tunnels, branch sewers, sewers in open trenches, and shafts, to consist of the materials and mortar described under clauses 13, 19, 20, and 21. All circular work and arches of shafts, or elsewhere, to be built of radiating bricks, unless otherwise directed. All bricks to be thoroughly soaked in clean fresh water for not less than five minutes immediately before being used. All work to be built with whole bricks, and all walls in English bond, with  $\frac{1}{4}$ -inch joints, in alternate courses of headers and stretchers, each brick to break joint with the one above and underneath, and to be set full and rubbed in cement mortar. Every course to be carefully and thoroughly grouted, and well wetted before the succeeding course is put on."
10452. What do you understand from that? That you call collar-joints the grouting between two rings of brick.
10453. Did you do that work? We did not put in so thick a joint as that.
10454. The thickness of your brickwork was 9 inches? Yes.
10455. What is the width of an ordinary brick? The size is 9 in. x 4 in. x 3 in.
10456. You say that your brickwork was 9 inches, add two bricks together—two 4 inches—and what would be the collar-joint? I do not see that that has anything at all to do with the matter. I have told you distinctly that I did not allow for any collar-joints in taking out the quantity of cement.
10457. But I want to show that according to your former evidence you did, and what is more, according to your evidence now, that you have allowed an inch? I have not said anything of the sort. I defy anyone to upset my test for brickwork. 5.5 of a cask of cement will do a yard of brickwork. I had a hard job to do the second yard with the quantity.
10458. But you say you have not allowed any cement for collar-joints? Not for what I call collar-joints. You will see another clause in the specification referring to the collar-joint between the concrete and the brickwork—where the concrete and the brickwork come together. That is what I call a collar-joint.
10459. The width of a brick you say is 4 inches, and the thickness of your brickwork was 9 inches, and you used two bricks? Yes.
10460. Then the remaining inch would be of compo? Yes. The second trial I made took nearly two of cement as against one and a half, so that I gave you a fair deal so far as that matter is concerned.
10461. Is the specification for Contract 79 the specification from which you have read as to the collar-joints? I do not see what collar-joints have to do with the matter, seeing that I have not included them.
10462. Will you look at page 282 of the Parliamentary return and tell me what the specification there refers to? To the southern outfall sewer at North Sydney.
10463. Will you read the part of the specification dealing with collar-joints? Yes; it is clause 110, page 287. I may mention that this is not the clause which I have had in view as referring to collar-joints, but it says:—"Where the brickwork consists of two or more rings, said rings to be built simultaneously, the lower ring to be always completed throughout  $4\frac{3}{4}$  inches in advance of the upper succeeding layer of each ring of brickwork, to be carefully and thoroughly wetted and grouted, and then covered with a coat of cement mortar, collar-joint,  $\frac{1}{2}$  inch thick, to ensure the thorough bonding of the joints and the different rings of brickwork."
10464. Would that collar-joint apply where there was single-ring work in the tunnel? No, there would not be a collar-joint there, only where it joins the rock-face or concrete.
10465. Suppose the brickwork in No. 79 were all single-ring work, would there be any collar-joint? There would be no collar-joint in the brickwork itself, but there is a part of the specification which says that where the brickwork goes against the concrete there is to be a collar-joint. If the collar-joint were not put in as against another ring of brickwork it would be put in between the brickwork and the concrete.
10466. But supposing no brickwork were built against the concrete there would be no collar-joint? No. The clause to which I have been referring is 112, and it says:—"Wherever concrete is to be built on to and against brickwork, or brickwork on to and against concrete, the latter in each case to be well wetted and grouted, and then to be covered with a coat of cement mortar, collar-joint,  $\frac{1}{2}$  inch thick, before
- the

the concrete or brickwork is built against it." I take that to mean that if there is only a single ring of brickwork the collar-joint would be between the concrete and the brickwork. G. M'Credie.

10467. Suppose the drawings show that there is no collar-joint whatever in the arch of the sewer? 31 July, 1896.

Then you would have to take the specification as against the drawing.

10468. Supposing no collar-joint were put in, would it be fair to include it in estimating the quantity of cement which would be used? I take it that the specification would be always taken as against the plan.

10469. But suppose the brickwork were all single ring and no brickwork were put against concrete, and that therefore no collar-joint would be used on the whole of the contract, would it be fair to compute the quantity of cement which would be used in a collar-joint and charge it against the contract? It would not be fair to charge it against a contract if it were not put in; but I suppose you understand how I worked out these quantities. I took the final voucher paid by the Treasury and made a comparison with the yards of stuff. I also made practical tests of the quantity of cement which would be used to carry out the specification, and made up my return accordingly. It is not for me to say whether the work was carried out by the contractors or not. It was my business to make up the return upon the basis I have named.

10470. You say you made experiments with brickwork? Yes.

10471. And you applied that experiment to what was done in these sewerage contracts? Yes.

10472. Now you tell us that your brickwork was 9 inches thick, and that in that brickwork you allowed an inch collar-joint? We used ordinary grouting; it would be about one-fourth inch thick. I could not say from memory what the exact thickness was in this case. I know that the most we could do was to make half a cask do a yard of brickwork.

10473. I wish now to take you to the second report you made to the Commission on the 23rd July. As to the gauging of concrete I suppose you used an ordinary fork? I used a 12-inch 10 pronged fork, the sort of fork you use upon Government work.

10474. There would be about an inch between the prongs? Yes.

10475. *His Honor.*] At the points? Yes; they run pretty well parallel.

10476. *Mr. Davis.*] You say you made an experiment in every respect in accordance with the Departmental specification? Yes.

10477. You were most particular as to that so that you might get a result upon which you could rely? Yes.

10478. Did you make any experiments with concrete before those referred to in your report of 23rd July? I have often made experiments with concrete. I may say that I consider the whole life of a professional man is an experiment as regards concrete.

10479. But did you make any experiments for the purposes of this inquiry? Only those referred to in my previous report, and I think those had reference to brickwork and rendering.

10480. You did not make any experiment as to concrete? Not specially. I think I said that the particulars I gave regarding concrete were taken from my general experience.

10481. Will you turn to your evidence of 8th July. You then gave the following evidence:—

7756. You used the same proportions as are contained in the Government specification—that is, you took a yard of brickwork at so much, the piping at so much, and the concrete at so much, making tests in each case? Yes.

7784. Now with regard to the bluestone concrete, how did you arrive at the quantity of cement in a cubic yard of bluestone concrete; what proportions are specified in the case of Contract 69? 4, 2, and 1. The cement and sand disappear in the metal. I found that there was 1'6875 casks of cement in a yard of concrete.

7788. Are you speaking now from the experiments you have made? From experiments I have made from time to time in connection with that class of work.

7790. Do you not think that the gauge of the stone has a great deal to do with it? I am speaking now of my experiments on different jobs. If you are referring to the experiment as regards this particular class of stuff, I think the gauge of the metal was  $1\frac{1}{2}$  inch.

How do you reconcile what you have just told us with your answers to these questions? I thought I made it perfectly clear, on 8th July, that I had not made any experiments with concrete—that is, any special experiments.

10482. I suppose the size of the stone would have something to do with the quantity of mortar absorbed, and which it would take to fill the voids? Yes.

10483. In other words, if the stone were of uniform size, say 2 inches cube, it would have more voids than stone which would run down from 2 inches to the size of a pea? Certainly; the tests show that.

10484. I do not know whether you noticed the evidence given by one of Mr. Parkes' witnesses in answer to question 2451. The witness said, "The metal was not the right sort of metal; it was too fine; it was more like sand; I think I can safely say that sometimes the bankers would measure over 20 feet, and a cask of cement is supposed to go to every banker." That might be a little exaggeration, but I suppose you would agree that the bulk made would depend upon the fineness or otherwise of the metal? Yes.

10485. Have you worked out the percentage of shrinkage, taking the dry material for your experiments? As against wet, do you mean?

10486. I mean as against concrete in position? No.

10487. Would you be surprised to find that it is 43 per cent.? I should not be surprised to find anything myself. I have not worked it out.

10488. Supposing authorities of standing give as their experience 25 per cent. in work under more favourable circumstances than that in sewerage works, what would you say? That has nothing to do with my tests. I have nothing to do with that.

10489. Would you say that your tests were reliable in the face of that? My tests are certainly reliable. I will stake my reputation on those tests. Disinterested persons besides myself witnessed them.

10490. What I mean is as to the application of your tests—your tests giving a shrinkage of 43 per cent., whereas undoubted authorities give as the shrinkage under more favourable circumstances than in sewerage works only 25 per cent.;—would you say in the face of that that your tests might be fairly applied to work in position? I certainly would. You will find that almost every authority differs, and I would take my own tests as against any authority. You must remember that putting the concrete into the box is a more severe test in this way—that in the box you make more bulk on account of the level filling



- G. M'Credie. filling and the level surface as against putting the concrete into an excavation where it would not be possible to make the surface as level as in a box.
- 31 July, 1896. 10491. Would you say that you could ram concrete horizontally to the same extent as you can ram it vertically. Let me put the case of a good, substantial pier, where the concrete is confined within a fairly smooth box, and another case where you have to pack the tunnel over brickwork, and where there are all kinds of little holes and curves cut out in the surface of the rock;—would you be able to pack over the arch of the tunnel as tightly as in the case of the pier? Of course not.
10492. Suppose you took 27 cubic feet of concrete on a mixing board, and first of all put it into the pier, you would expect to get 27 cubic feet of concrete? Yes; less the shrinkage.
10493. Putting the same quantity over the arch of the sewer, would you get more or less in measurement? It is a question as to how the excavation is taken out. I should take it that in a work such as that with which we are dealing in these contracts, where the Department pay for only the exact measurement, and where the tunnel was blasted from time to time, that it would take more than 27 feet of concrete to fill up a yard.
10494. Suppose the tunnel were measured accurately, would you make 27 cubic feet of measurement out of 27 feet of concrete as it lay on the board? Assuming that you do not ram every 9 inches on the side of the sewer, what you want me to say is that it is more difficult to get 27 feet in round the sewer. I should say that it would be, but I will not say that it would take more stuff.
10495. Did you use Molesworth and Hurst? No, I used no formulas; I relied upon my particular tests.
10496. Then what did you mean in reply to Question 7851-2-3? I had the references, but I never used them. I have "Molesworth" in my bag now as far as that is concerned.
10497. Will you show me the page of Molesworth to which you referred? At page 309 of Hurst you will find the following: "As a rule, 1 cubic yard of broken stone or clean shingle is required to make 1 cubic yard of concrete, but if the sand be increased beyond the above proportion the quantity of shingle required is diminished, although in a somewhat less ratio than the sand." I may mention that Mr. Parkes had been asking me questions about the disappearance of sand and cement in the interstices of metal.
10498. How many parts of stone or shingle have you in the case to which you have just referred? Six parts of clean shingle, 2 of sand, and 1 of cement.
10499. Would you suppose that 4 parts of stone would have as many voids as would 6? It depends upon the gauge.
10500. But taking the same gauge? You want to compare Hurst with the tests. I must object to comparing Hurst with our tests at all. It is outside of the question altogether, because ours were practical tests, fairly and legitimately made upon your specification.
- 10501-2. Sutcliffe, upon page 136 of his work "Concrete, its Nature and Uses," says, "The test No. 8 is one of a series given by Lieut.-Colonel Gillmore in his book on 'Limes, Hydraulic Cements, and Mortars.'" He succeeded in obtaining aggregates with a minimum percentage of voids; ordinary limestone was crushed by a Blake's stone-breaker into pieces of all sizes below 2 in. cubes, and into various shapes; and gravel was obtained from the seashore, consisting, after the sand had been screened out, of pieces varying "from the size of a pea to that of a hen's egg." He found that the least amount of voids occurred in those mixtures which contained 15 measures of gravel and from 11 to 15 measures of broken stone. The worst mixture (15 to 27) contained only 30 per cent. of voids. The best (15 to 13) contained 23 per cent. This is a vast improvement on the voids mentioned above for broken stone of nearly uniform size. Solid concrete made from the latter would be 20 to 30 per cent. weaker than that made from the former, while the cost of the two would be practically the same. Roughly speaking the bulk of Portland cement is, according to Mr. Sandeman, reduced 10 per cent., and of sand 20 per cent., by mixing with water, and the contraction in volume caused by mixing sand and cement together is about 5 per cent. According to Mr. Sandeman, a further contraction of 4 per cent. takes place during the setting of the mortar. From these data we may calculate that cement and sand, 1 to 1, will produce mortar about 76 per cent. of their volume; 1 to 2 about 74 per cent.; and 1 to 3 about 73 per cent. I want to ask you in the face of that whether you still say that 43 per cent. of void is applicable to the case in point? I will not say anything of the sort. I say that these tests are made entirely on the specification. I am not going to compare them with any authority.
10503. As to whether they apply or not you are not concerned? They do apply, because the specification states that the materials are to be used. As a practical man, I would insist upon the application of the conditions. What is the good of a specification if it is not carried out?
10504. Do you always work up to specification precisely? I endeavour to do it as far as I can, but I am not infallible.
10505. Here is another extract from a treatise on masonry construction, by Ira O. Baker, Professor of Civil Engineering in the University of Illinois. He gives the results of 10,000 yards of concrete used in New York; the shrinkage was 25 per cent. At page 111 he gives the analysis of the composition and cost of the concrete employed for laying the foundations of a sea-wall at Lovell's Island, Boston Harbour; in that case, also, the shrinkage is 25 per cent. The total materials are given as 1.27 cube yards, at a cost of 1 dollar 67 cents, and he gives the total cost of 1 cube yard of concrete in place as 2 dollars 11 cents; the proportions for the concrete were 1 of cement, 2 of sand, and 7 of gravel;—would you still say that your 23 per cent. shrinkage would have any application? What I say is that my tests are correct, and are made in accordance with the materials specified.
10506. Do you say that you mixed the concrete, in the experiments you made, in conformity with the specification? Yes.
10507. Will you turn up the specification and show me where it is specified that the metal shall be forked? It is not specified to be forked, but how would you specify it—would you say that it should be sieved?
10508. Did you sieve it? No; I forked it.
10509. What was the measurement of your fork? About an inch between the prongs.
10510. Will you take the specification and tell me what the mesh of the screen is? It is a small mesh screen. Perhaps I had better tell you what we did. The metal was broken to the gauge specified. It was then put into a barrow, washed, and turned out on to the board, and mixed first with the sand on top and then with the cement on the top of that.



10511. Will you tell His Honor what the mesh of the screen is according to the specification? Clause 26 says:—"Sandstone concrete, where ordered to be used in these works, to be composed of one part of Portland cement, two parts of sand, and five parts of sandstone (as specified under clause 16) metal, free from dirt, quarry refuse, sieved (as specified in clause 18), washed, and of a size to pass with its largest dimensions through a ring of 2 inches in diameter. All materials to be mixed in the same manner as hereinafter specified for concrete." If you turn to clause 18 you will find the following:—"Broken stone for bluestone concrete to be of basalt or other similar hard stone of approved quality; to be broken by hand or crushing machine, of a size to pass freely with its largest dimensions through a ring of 1½ inch in diameter; the whole of the metal to be free from dirt, quarry refuse, &c.; to be screened through a sieve of meshes ½ inch apart, and then to be washed with fresh water until approved, before it shall be deemed fit and suitable for these works."
10512. You did not screen the metal? No; as I have said, we forked it, and then washed it in a barrow to see that there was no dirt or anything of that kind in it.
10513. *His Honor.*] When you say you forked it do you mean that you took it on a fork from one position to another? Yes.
10514. So that a great deal of the small stuff less than 1 inch in diameter would drop through? Some of it would drop through. Some of the stone used was less than the full dimensions.
10515. But your forking would reject a great deal of the very small stuff? Yes. Of course when dross and rubbish are put in they take the place of cement and sand, and the concrete is not so good.
10516. *Mr. Davis.*] If the metal were put over a screen with ¼th mesh what would pass through the screen? There should not be any small stuff, any dust, or dirt left in the stone.
10517. Would anything more than dust go through? Very little more than dust.
10518. So that the specification provides that anything between 2 inches in the case of sandstone and 1½ inch in the case of bluestone down to a pea may be used in the concrete? No; I would not say that. It is specified to be broken to 1½-inch gauge.
10519. *His Honor.*] You mean that that is to be the maximum? Yes. Some of the stone is to be broken to 2 inches, some to 1½ inch, and then there is the ¾-inch screenings. If you are going to mix the lot together what is the use of having them specified in this way. If a man gets a job to break metal to 1½-inch gauge, he is supposed to break it to that gauge and not to fill it up with a lot of small stuff.
10520. *Mr. Davis.*] You admit that the specification reads rather differently from that? That is the way I should read it.
10521. But the specification under review is a different thing? I do not admit that at all. You specified for the stone to be broken to a certain gauge.
10522. The specification speaks for itself? Yes.
10523. What was the size of the box you used for gauging the mixture? 4 feet by 12 inches by 12 inches.
10524. How did you gauge the ½ cubic yard of sandstone? I mixed 13½ cubic feet of 2-inch stuff.
10525. How did you gauge it? I put it into the barrow, washed it, and forked it into the box.
10526. How did you measure the balance? It was measured exactly in the 4-foot box.
10527. Is that the way stone is usually measured for large contract works? The proportions would be just the same as though you were using double the size of box.
10528. But is it usual upon large contract works for a man to stand by with a rule and measure to an eighth of an inch the height of the stone? I do not think it is usual, but we had to make a test, and I am here prepared to swear that we made it, and that it was not scamped in any way whatever.
10529. And you wish us to take that test by itself without reference to the way in which sewerage works are carried out? I take the test simply as it was carried out.
10530. Without reference to the sewerage works? It had reference to the sewerage works, because it was based on the specification.
10531. I suppose you measured the sand in the same way? Yes.
10532. How did you measure the cement? We took a cask of cement to be 4 feet; we measured and weighed the cask so that there might be no mistake about it.
10533. You used a fork for the bluestone? Yes; we forked it out of the barrow on to the board.
10534. What size of stone did you use for the special concrete? ¾-in. screenings.
10535. Is that what is specified? It does not appear to be named in the specification.
10536. Did you, in making your experiment for special bluestone concrete, use the size of stone specified? We took it at ¾-in. instead of 1½-in., as specified in Contract No. 77.
10537. You did not comply with the specification in that respect? No; we took ¾-in. in the case of the 7, 3, and 2; but there is not very much of that work.

James Symonds recalled and further examined:—

10538. *Mr. Parkes.*] Since you gave evidence here before, Mr. W. A. Smith has stated that the vouchers to which you referred as showing the cost of the Monier culvert at Strathfield are incorrectly given;—you have made investigations which satisfy you as to the correctness of the figures you formerly gave? Yes; not so much to show the correctness of my figures as the incorrectness of Mr. Smith's figures.
10539. *His Honor.*] What course have you taken in making the investigations? I have dealt with Mr. Smith's objections *seriatim*.
10540. *Mr. Parkes.*] The vouchers you used on the last occasion were signed by yourself and countersigned by Mr. Smith? They were signed by myself, and initialled by Mr. Smith to certify that they are correct. As regards voucher 389, Mr. Smith is quite in error in stating that fourteen casks of cement charged were not used, the fact being that none or but very little was left over, as can be shown by the fact that a fresh supply was needed and obtained for the next work. The men when they left this work went to put in another small culvert, and in order to do the work necessary—that is, in making an inlet which required only two casks of cement—we had to get a fresh supply. As to voucher 275, Mr. Smith objects to the payment of the amount of £25 16s. to Mr. Bramston on the ground that he was not actually engaged upon the work. I say that he had very little else to attend to while this work was in progress, and that the whole of his two months' pay was rightly charged to this work. I defy Mr. Smith to

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J. Symonds. to point out any definite work of any consequence which he had to do at that particular time in addition to this work. The deduction wrongly claimed by Mr. Smith amounts to £25 16s. As to voucher 414, 31 July, 1896. Mr. Smith in his evidence says that the culvert was completed and open for traffic subsequent to 2nd August, but there are five days or four working days for which he does not account, and the wages of the five men for that time would amount to £7 4s.

10541. *His Honor.*] That would leave a deduction of only £2 16s. 11d. instead of £10 0s. 11d.? Yes.

10542. *Mr. Parkes.*] What is the next item? That is voucher 201. The bolts referred to in that voucher were not used in the actual construction of the culvert, but they were used for bolting the centering together, so that there is really very little difference. As to voucher 327, the whole of the amount was for the repair of tools used upon the work. I allowed an amount of 11s. 9d. for the blacksmith, but Mr. Smith says that 8s. 3d. of this amount is for sharpening road-picks, &c. The whole of these tools were used upon the work of the culvert and that work only. The men upon the road keep their own tools, and therefore that would not interfere with this item.

10543. *His Honor.*] The expenditure would be for the sharpening of picks used for the excavation for the piers and the trenching? Yes.

10544. *Mr. Parkes.*] What is the next item? Vouchers 467, 468, 469. They are Water and Sewerage Board's charges for the removal of the main, and were consequent upon this unnecessarily large culvert being put in. Then as to the question of wages upon voucher 189, Mr. Smith says that Isles did all the carting for the culvert. Isles did not do all the carting for the culvert but merely the cartage of plant to the work. W. Thompson, the road carter, did most of it, such as the carting of gravel and sand from the railway, the metal to make good the roadway, the spoil from the excavation, and the removal of plant, &c. Mr. Smith in what he says as to this item shows that he did not know as much about the matter as I did myself.

10545. *His Honor.*] What carting did Isles do? The only carting he did was to take the plant out to the work. No record was kept, but the whole of the carting done by Thompson would probably amount to £6, that is allowing twelve days for one man with a horse and cart. That I did not bring into my account before.

10546. What is the next item? Vouchers 190, 224, 270, 363, 414. Approximately the whole of these wages had to do directly or indirectly with the construction of this culvert, and consequently are a correct charge against it. The division of time I look upon as fictitious,—that is to say, the old rotten brick structure was scarcely any hindrance to excavating the trench for the new one. The cutting of the outlet drain is also mentioned, whereas this item of work was done prior to the work of the culvert being commenced. I have a distinct recollection of sending two men to cut this drain. I was asked to send men to clear out the drain in order to get a proper level. That was done before the culvert was touched.

10547. *His Honor.*] In what account does the cutting of the outlet drain appear? It formed part of the maintenance of the road. I distinctly remember sending two men to do the work; Mr. Smith puts it down here as an excuse. He says that the two men were partly engaged upon that work while the culvert was in construction, whereas it was done before the culvert was commenced. As to voucher 220, the item there has to do with the preparing of the centering for the culvert. Although I did not certify to that voucher I know that all the man did was to prepare the centering for this culvert. It was prepared at Iron Cove and carted out. Mr. Smith's statement as to the man Davis or Davidson is incomprehensible. The man's time, forty-nine and a-half days, I believe to be correct. He was on the work until nearly the finish, and certainly did not go to the gas works bridge until September. These deductions of £48 2s., as represented by the above items, are fictitious. There is altogether a sum of £109 15s. 5d. which must be added to Mr. Smith's total of £109 18s. 9d.

10548. *Mr. Parkes.*] Do you solemnly declare that of your own knowledge that is the cost of the culvert? It is not the total cost of the culvert, because there are other items which have not been included.

10549. But all the expenditure you have given was in connection with the culvert? I do not say that it was all expenditure upon the actual walls of the culvert, but it was all upon work incidental to it.

10550. When you were last here some reference was made to moneys which had been taken from the Main Southern and Western Road accounts and used on this Monier culvert and for other purposes for which it was not intended. You said then that you could not call to mind any instances in which that had been done, but you have since found evidence in support of your statement? I have no recollection of any other amounts beyond those I have given being expended upon this culvert, but I have found vouchers showing that money has been paid for certain objects when it was voted for totally different objects.

10551. Will you give us some instances? Yes. I have a list of vouchers paid from the Parramatta district votes for wages and other matters not applying to the district. Take voucher 475 in 1892. Brown and others were working in the Sydney district, but the amount was charged to the Main Windsor Road to the extent of £42 13s. 6d. The men were not within 20 miles of the road.

10552. What was the particular work upon which the men were engaged? Brown and Byrnes were working near Sydney—between Ashfield and Sydney I think. I do not know where the others were working.

10553. What are the other cases? There is voucher 498, also for the year 1892. It is an amount of £2 to Mr. W. A. Smith for work presumed to be done and expenses presumed to have been incurred for supervision in the Parramatta district, whereas his voucher states that on May 13th the expenses were incurred in going to Hornsby and Galston, in a different district. The amount was nevertheless charged to the Parramatta district. Then there is voucher 925. The amount is £55 11s. 6d. for Wells and others. They were working in the Metropolitan district, and the amount was charged to the Main Southern Road. The next voucher is No. 18, in the year 1893, and it is for an amount of £39 5s. 9d. for Mr. W. A. Smith, extra travelling allowance while in charge of the Metropolitan Division. I have not put it in my list. It is certified to as extra travelling allowance, and although it did not apply to my district it is charged to the Main Southern Road.

10554. *Mr. Parkes.*] Is there any minute upon that voucher? Yes; there is a minute from the Examiner of Accounts to Mr. W. A. Smith as to authority. Mr. Smith says, "See Commissioner's minute of 5/2/92 on papers 91-9,336 herewith attached. The conditions under which the Commissioner wrote this minute are unaltered." The Commissioner's minute is not here. Mr. Hickson wrote the following minute: "Mr. Smith, with reference to our conversation this morning." He afterwards wrote another minute in which he said, "As Mr. Smith had to keep (owing to the extensive district under his charge, from the Hawkesbury to National Park, and as far as Penrith) an expensive equipment and establishment his allowance was fixed at the highest rate, viz., £175 per annum." 10555.

10555. Was that amount paid out of the Main Southern Road? Yes. The other items are vouchers— J. Symonds.  
430 in the year 1893, representing £5 for Mr. W. A. Smith, of which only £1 applies to the Parramatta District; voucher 277, a payment to W. Larkin of £18 15s., and charged to the Main Southern Road, 31 July, 1896.  
although he was foreman in Sydney; voucher 418, a payment of £32 10s. to Larkin and another, also charged to the Main Southern Road; voucher 518, a payment of £13 to T. Wells, also charged against the Main Southern Road; voucher 551, a payment to Mr. W. A. Smith, £6 18s. 8d., being charged to the district, and only one item applying; voucher 298, a payment to Mr. W. A. Smith, £12 0s. 11d., and one item only applying; and voucher 419, also a payment to Mr. W. A. Smith, £9 14s. 5d., being charged, and only one item applying. I have taken these items as being among the most conspicuous. There are various others which I have not taken, and about which there might be some quibbling as to their being partly chargeable to the district.
10556. As to Mr. Bramston, Mr. Smith says that he worked upon this culvert only for a few days;—what do you know of him and his payments? I should not have returned him as working upon the culvert if he were not there.
10557. It was you who made out his vouchers? They were made out in my office, and I signed them as being fairly chargeable against the work.
10558. Can you positively declare that Mr. Bramston worked at this culvert during the time to which you have certified? For the greater part of the time.
10559. Was he away from the work for any time? He might have been away for half a day. He might have gone once or twice a week as far as the Gas Works Bridge at Parramatta; some painting was going on there and he had to go occasionally to look at it.
10560. But his constant work was in the supervision of this culvert? Yes; Mr. Smith distinctly said that he wanted Mr. Bramston to be there.
10561. *His Honor.*] You have not analysed the accounts and made an estimate to institute an exact comparison between the cost of the Monier arch work and the cost of either brick arch work or a buckle-plate covering in substitution for it? No; I have not gone into that matter. The work was undertaken upon false premises. It was stated to be 50 per cent. cheaper and it proved to be 100 per cent. dearer.
10562. *Mr. Davis.*] Mr. W. A. Smith had charge of the Parramatta district as District Engineer? Yes.
10563. Would it not be a legitimate thing to pay from the Parramatta district vote part of his expenses? Yes; I have left out the items having to do with travelling expenses in that district.
10564. As to the work being performed in other districts outside of the Parramatta district, and paid from the Parramatta district vote, I suppose the work was faithfully performed—there is no question about that? My point is that it was against the Audit Act, and Mr. Smith must have known it.
10565. But there is no question about the work having been performed? I do not know; probably the men were working in Sydney district.
10566. You have no reason to suppose that they were not working? No; but they were not working in the district to which their wages were charged.
10567. As to the Monier culvert, your son had charge of it under Mr. Smith? Yes, he attended there every day.
10568. He worked immediately under Mr. Smith? Yes.
10569. That being so you had nothing whatever to do with the work except to pass the vouchers through your accounts? There were various things to be done; for instance, there was the carting. I distinctly remember telling a carter to go to the culvert and do anything that was required.
10570. But you left the details of the work to your son? Yes, and to Mr. Bramston.
10571. And they worked in conjunction with Mr. Smith? Yes; but it does not follow that I knew nothing about it.
10572. So that Mr. Smith would be likely also to know something about it? Yes, of course.
10573. *His Honor.*] Mr. Bramston was an Inspector employed generally by the Department? Yes, for inspecting such jobs as this.
10574. *Mr. Davis.*] Was his employment continuous? It was continuous at that time. As an Inspector for the Metropolitan District he would supervise small jobs. He would be on the job to see to the men's time.
10575. *His Honor.*] Without being permanently engaged, he was employed as continuously as if he were? No not continuously, because as happened shortly afterwards there was no work and he was discharged. As long as there was work going on he was kept on.
10576. He might be told to go on to more work at the time that this particular culvert was in construction? Yes.
10577. If there were two works within a distance of 1 or 2 miles of each other going on at the same time he would be employed upon both works as an inspector? Possibly, if they were not important works.
10578. Culverts, and works of that kind? Yes.
10579. *Mr. Parkes.*] Did that happen in this instance? There was only the other work which I have mentioned—that is, the painting of the Parramatta Bridge. He used to go there occasionally to look at that work. There would be no reason for him to be there specially, because the work was near my office, and I used to supervise it myself. This culvert was his special work at the time.
10580. I suppose there can be no doubt that the Monier arch was cheaper than a brick arch over the culvert, taking the arch alone? I cannot see any reason for saying that it was cheaper. It was certainly dearer from the way in which it was carried out.
10581. Have you taken out the quantities to see;—have you separated the vouchers for the Monier work itself? You cannot get at it from the vouchers or anything in my office. I remember my son giving me a slip of paper at the conclusion of the work, from which it was shown that the arch had cost so much money. That is the only way I got at the cost.
10582. Did he say that the Monier arch cost more than a brick arch would have cost? I do not think we discussed the matter.

John Carter recalled and further examined :—

J. Carter. 10583. *His Honor.*] I believe you wish to make a statement? Yes. I was asked the other day a question in connection with my financial dealings with Mr. Weedon. I was asked if I did not give him a promissory-note. On being asked that question, I at first thought I had done so. I remember that the question had been discussed and that a promissory-note had been written. I afterwards found that it had not been handed over to Mr. Weedon. That statement has not been corrected by any other evidence I have since given. I had to appeal to Mr. Weedon before I could be quite sure of the circumstances. The number of the question to which I refer is 7629.

10584. *Mr. Parkes.*] You say that you did not give Mr. Weedon a promissory-note? No.

Joseph Davis recalled and further examined :—

J. Davis. 10585. *Mr. Parkes.*] Will you read Mr. Hickson's minute upon the document which I now hand you, in connection with the sureties for Mr. Ahearne's contract? Yes. He says,—“I recommend that Mr. Ahearne be asked if Mr. M'Ardle has property to the value of the penal sum required in the Colony. If not, he should be asked to give the name of someone who has.”

10586. Mr. M'Ardle was proposed as personal security for Mr. Ahearne's job? Yes, in conjunction with Mr. Henry Hudson, of Darling Point.

10587. Is it not the practice of the Government to take sureties only from those who have landed property in the Colony? I do not think so.

10588. Is it not the only tangible security they can have? I think the Department would take a man like Mr. Henry Hudson without going into the thing at all. He is known to be a stable man. In this instance, Mr. M'Ardle was an unknown man.

10589. Mr. Hickson asked if he had landed property in the Colony? Yes. He evidently had some doubt in his mind.

10590. Will you read the declaration recently made by Mr. Gillan in Adelaide, which I now hand you? Yes. It is as follows :—

IN THE MATTER OF THE PUBLIC WORKS INQUIRY COMMISSION.

I, JAMES GILLAN, of Clarendon, in the province of South Australia, contractor, do solemnly and sincerely declare as follows :—

1. All the property now beneficially held by me is of the value of not less than £6,000, as I verily believe, and consists of the items following, that is to say :—

|  | Approximately. |
|--|----------------|
| In the Bank of New Zealand at Adelaide.....  | £550 0 0       |
| In the Bank of New Zealand at Sydney .....   | 115 0 0        |
| Bank fixed deposit receipts and interest .....   | 1,015 0 0      |
| Personal effects in South Australia, including furniture, piano, horse, harness, and sundries—market value ..... | 300 0 0        |
| Six shares in Adelaide prospecting syndicate—market value .....  | 60 0 0         |
| Shares in Town and Country Building Society, Sydney—market value .....   | 50 0 0         |
| Money due me by Carter, Gummow, & Co., for money lent.....   | 1,000 0 0      |
| My interest as partner of Carter, Gummow, & Co., in the surplus assets of that firm .....                        | 3,100 0 0      |
|  | £6,190 0 0     |

2. My personal liabilities, exclusive of my liability (if any) under the bond for £6,000 executed in or about the month of May, 1895, do not exceed £20 to the best of my knowledge, information, and belief.

3. There are no mortgages or bills of sale on any of my said property.

And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of an Act made and passed in the sixth year of the reign of His Majesty King William the Fourth, intituled “An Act to Repeal an Act of the present Session of Parliament, intituled ‘An Act for the more effectual Abolition of Oaths and Affirmations taken and made in various Departments of the State, and to substitute Declarations in lieu thereof and for the more entire suppression of Voluntary and Extra-Judicial Oaths and Affidavits’ and to make other provisions for the abolition of unnecessary Oaths.”

JAMES GILLAN.

Declared at Adelaide the 17th day of July, 1896, before me,—

WM. HENDERSON,  
Notary Public.

10591. You see from that declaration that Mr. Gillan had no landed property at that time in this Colony ;—is not that so? It does not appear from the declaration that he had.

10592. Is there any fixed security named in the declaration ;—is there any item which is not a movable security? I should say that landed property, seeing that it could be sold, would be almost as movable a security, from one point of view, as a great many of these items.

10593. All the moneys referred to could be drawn out of the bank at a moment's notice? Yes, and landed property could be sold.

10594. You notice that he mentions £3,100 as representing his interest in Carter, Gummow, & Co.'s business? Yes.

10595. Then there can be no doubt as to Mr. Gillan being a partner in the firm of Carter, Gummow, & Co.? He says that on 17th July, 1896, he was a partner.

10596. He mentioned that his interest in the firm of Carter, Gummow, & Co. in respect of contracts now going on amounted to £3,100? Yes.

10597. Do you think he was a proper surety to take for Contract 77 in connection with the substitution of the Monier design? I can give you my opinion for what it is worth.

10598. Would you consider him a proper surety? I should say that he was a stable man.

10599. But, having regard to his interest in the firm, and seeing that he had no landed property in the Colony, where is the security? If the Department had found Mr. Gillan's name at the foot of the tender as a partner of the firm of Carter, Gummow, & Co., which was not the case, and if Carter, Gummow, & Co. had asked the Department to take Mr. Gillan as a surety, they would have refused him point blank.

10600. Did they not know well that Mr. Gillan was a member of the firm of Carter, Gummow, & Co.? They knew that he had been associated with the firm for some years—at one time with Mr. Gummow, and more recently with Mr. Carter, in various jobs. At the same time the Department had to do what any other reasonable person would do in the circumstances; they saw at the foot of the tender the names of Messrs. Carter, Snodgrass, and Gummow. It did not appear that a Mr. Gillan was, as you suggest, a member of the firm.

10601.

10601. Did the Department make the slightest effort to find out whether Mr. Gillan was connected with the firm or not? I cannot say. It was no part of my duty. J. Davis.  
 10602. Did you hear of anyone else making inquiry in that direction? It was no part of my duty whatever. 31 July, 1896.  
 10603. *Mr. Norrie.*] Will you look at Mr. M'Ardle's address given in Mr. Ahearne's letter? Yes. Brisbane is given in the first instance. That is scratched out and Sydney is put in. I should imagine that seeing that Mr. M'Ardle was a Brisbane man Mr. Hickson would very properly write the minute to which Mr. Parkes has referred, not knowing anything about him.

*MONDAY, 3 AUGUST, 1896.*

William Henry Warren recalled, and further examined:—

10604. *His Honor.*] You now have ready the report you were asked to make to the Commission as to the value of the aqueduct in the original plan of Contract 77, and also in the substituted Monier plan? Yes. I met Mr. M'Creddie, Mr. Thompson, and Mr. Davis, and we agreed as to the quantities. I have a list signed by those three gentlemen giving the quantities in each case, and upon those quantities I have based an estimate. My first estimate deals with the Monier plan, and in that case the total is £15,565 6s. 5½d.; the value of the Departmental design I make £15,789 10s. 6d. That estimate was based upon the prices in the schedule less the 28½ per cent. My third estimate is based upon the same quantities, but I put in the prices myself, and I make the total £17,660. W. H. Warren.  
3 Aug., 1896.  
 10605. That is for the whole contract? Yes. I may mention that in each case I have added to the value of the aqueduct work £6,362 2s., in accordance with the estimates given to me by Mr. Davis, and to which Mr. Thompson and Mr. M'Creddie agreed. That amount represents the quantities common to both designs, exclusive of the aqueducts.  
 10606. Will you first give us the details of your estimate in the case of the Monier plan? Yes. My report concerning both designs is as follows:—

ESTIMATE of the total cost of the Aqueducts and Tunnels in the Contract.

| Quantity.         | Description.   | Rate.                   | £       | s. | d. | £     | s. | d. |
|-------------------|--|-------------------------|---------|----|----|-------|----|----|
| 1,533 cub. yds... | Material above skewbacks in Monier system                  | @ £3 19s. 6½d. cub. yd. | 6,098   | 15 | 8  |       |    |    |
| 18.2 tons .....   | of ironwork .....  | @ £14 per ton .....     | 254     | 16 | 0  |       |    |    |
| 140 .....         | Expansion joints, at 2½ cwt. each = 15.75 tons.....        | @ £11 10s. per ton ...  | 181     | 2  | 6  |       |    |    |
| 10,625 .....      | Squads of rendering, 1 to 1 .....                          | @ ls. 9½d. ....         | 951     | 16 | 5½ |       |    |    |
|                   |  |                         |         |    |    | 7,486 | 10 | 7½ |
| 158½ cub. yds.    | Bluestone concrete .....                                   | @ £2 10s. cub. yd. ...  | 396     | 13 | 4  |       |    |    |
| 1,350 ,, ..       | Sandstone concrete.....                                    | @ £1 8s. ,, ...         | 1,890   | 0  | 0  |       |    |    |
| 1,016 sq. yds.    | Rendering, 2 to 1 .....                                    | @ 2s. 3d. sq. yd. ....  | 114     | 6  | 0  |       |    |    |
|                   |  |                         | 2,400   | 19 | 4  |       |    |    |
|                   | Less 28½ per cent. ....                                    |                         | 684     | 5  | 6  |       |    |    |
|                   | Add cost of the remainder of contract in tunnels, &c. .... |                         |         |    |    | 1,716 | 13 | 10 |
|                   |  |                         |         |    |    | 6,362 | 2  | 0  |
|                   | Total cost of contract .....                               |                         | £15,565 | 6  | 5½ |       |    |    |

SUMMARY.

ESTIMATED Cost of Monier Arch structure complete, per cubic yard.

|  |    |    |    |   |
|--|----|----|----|---|
| Compo. and concrete in arch and carrier .....                              | £  | 1  | 11 | 6 |
| Labour in do. ....   | 0  | 17 | 2½ |   |
| Supervision .....  | 0  | 5  | 0  |   |
| Grillage.....  | 0  | 5  | 6  |   |
| Plant .....  | 0  | 2  | 5  |   |
| Timber .....   | 0  | 7  | 6½ |   |
|  | £3 | 9  | 2½ |   |
| Add 15 per cent. profit, royalty, and risk, &c., including guarantee ..... | 0  | 10 | 4½ |   |
|  | £3 | 19 | 6¾ |   |

TIMBER in Centering and Boxing.

|   |       |             |
|---|-------|-------------|
| Timber in ribs.....   | 280   | cub. ft.    |
| Lagging at top 80 x 9 x 1½ = 1,080 }                        |       |             |
| Side boxing 83' x 18' x 1½" = 374... }                      | 1,454 | sup. ft. 1" |
| Supporting ribs .....                                       | 192   | cub. ft.    |
| 6 spans for small arches 2 x 7' x 12" x 2½" at 35 each..... | 210   | ,,          |
| 6 spans of lagging to small arches 1½" .....                | 500   | ,,          |
| Boxing small piers.....                                     | 750   | ,,          |
| Timber in sides of main carrier .....                       | 1,370 | ,,          |
| ,, ribs.....  | 610   | ,,          |
| ,, lagging, 30 sup. ft., per ft. ....                       | 2,475 | ,,          |
| Scaffolding .....   | 260   | ,,          |
| Sides to small arch .....                                   | 150   | ,,          |

732 cub. ft. + 7,517 sup. ft.

SUMMARY.

|  |      |    |    |   |
|--|------|----|----|---|
| 732 cub. ft., at 2s. 6d. cub. ft. .... | £    | 91 | 10 | 0 |
| 7,517 sup. ft., at 13s. per 100 .....  | 48   | 17 | 0  |   |
|  | £140 | 7  | 0  |   |
| No. 4 sets of timber in str. ....      | 561  | 8  | 0  |   |

Cost  $\frac{11,228}{1,533} = 7s. 6\frac{1}{2}d.$  per cub. ft. of structure.

Cost

W. H.  
Warren.  
Aug., 1896.

| Cost of labour in the Monier System.   |  | £      | s.    | d.                    |
|--|--|--------|-------|-----------------------|
| Building 17 spans of 82 ft. 6 in. each, at £60 12s. 6d. ....   |  | 1,030  | 12    | 6                     |
| 42 small arches, at £3 10s. ....   |  | 147    | 0     | 0                     |
| 574 lineal feet of carrier beyond the main arches, at 5s. per foot .....   |  | 143    | 10    | 0                     |
| Total cost of labour .....   |  | £1,321 | 2     | 6                     |
| Cost of labour per cubic yard = $\frac{£1,321 \text{ 2s. 6d.}}{1,533}$ .....   |  | 0      | 17    | $2\frac{1}{2}$        |
| Supervision, about 5 per cent., say £375; per cubic yard = $\frac{375}{1533}$ = about 5s.  |  |        |       |                       |
| Cost of grills in arches and carriers, 37 tons, at £11 10s. per ton = £425 10s.; cost per yard = $\frac{8510}{1533}$ = 5s. 6d.     |  |        |       |                       |
| Cost of plant, consisting of two sheds, one office, tools, barrows, &c. ....   |  | £      | s.    | d.                    |
| 2,000 feet of water-pipe, at 3d. ....  |  | 150    | 0     | 0                     |
| Cost of water, $1\frac{1}{2}$ d. per yard of concrete—1,533 at $1\frac{1}{2}$ d. ....  |  | 25     | 0     | 0                     |
|  |  | 9      | 11    | 7                     |
| Cost per yard = $\frac{£184 \text{ 11s. 7d.}}{1,533}$ = 2s. 5d.  |  | £184   | 11    | 7                     |
| <b>ESTIMATE of the labour in one span of the Monier Arch.</b>  |  |        |       |                       |
| To place the concrete in the arch, 1 day, 10 men at 7s. 6d., 1 man at 10s. ....  |  | 4      | 5     | 0                     |
| "                    "                    Spandrel arches and piers, 10 men at 7s. 6d., 1 man at 10s. for 2 days                   |  | 8      | 10    | 0                     |
| To placing concrete in main carrier, 1 day, 12 men at 7s. 6d., 1 man at 10s. ....  |  | 5      | 0     | 0                     |
| Making cover plates, 1 man for 4 days at 7s. 6d. ....  |  | 1      | 10    | 0                     |
|  |  |        |       | 19 5 0                |
| <b>Timber Work—</b>  |  |        |       |                       |
| Making and fixing spandrel piers and arch centering and boxing—4 men at 7s. 6d., 1 man at 10s. for 4 days .....                    |  | 8      | 0     | 0                     |
| Making and fixing centres to main arch—12 men at 7s. 6d., 1 at 10s. (one day).....   |  | 5      | 0     | 0                     |
| Making and fixing main carrier—4 men at 7s. 6d., and 1 man at 10s. (4 days) .....  |  | 8      | 0     | 0                     |
| Lagging and side boxing—12 men at 7s. 6d. ....   |  | 4      | 10    | 0                     |
| Removing the above timbering, say .....  |  | 7      | 0     | 0                     |
| Erecting and removing scaffolding, say .....   |  | 1      | 0     | 0                     |
|  |  |        |       | 33 10 0               |
| <b>Ironwork—</b>   |  |        |       |                       |
| To make and fix the iron grid in the main arches—7 men at 7s. 6d. and 1 at 11s. 6d. ...  |  | 3      | 4     | 0                     |
| "                    "                    small arches—5 men at 7s. 6d. ....   |  | 1      | 17    | 6                     |
| Main carrier—8 men at 7s. ....   |  | 2      | 16    | 0                     |
|  |  |        |       | 7 17 6                |
|  |  |        |       | £60 12 6              |
| <b>Cost of Compo. Material.</b>  |  |        |       |                       |
| 1 Cask of Cement and 12 cubic feet of Sand make $13\frac{1}{2}$ cubic feet or $\frac{1}{2}$ a cubic yard of Compo.—                |  |        |       |                       |
| 24 cubic feet of Sand, at 7s. 6d. a cubic yard .....   |  |        | 0     | 6                     |
| 2 Casks of Cement, at 11s. 6d. each .....  |  |        | 1     | 3                     |
|  |  |        |       | £1 9 8                |
| <b>Cost of Bluestone in Carrier.</b>   |  |        |       |                       |
| 10 cubic feet of Stone, 6 cubic feet of Sand, and 1 Cask of Cement make about 15 cubic feet in place                               |  |        |       |                       |
| Bluestone Toppings. Cost on Wharf, 6s. 10d. per ton, or 18.5 cubic feet to the ton—  |  |        | 0     | 10                    |
| 27 cubic feet would cost .....   |  |        | 0     | 2                     |
| Carting to Site.....   |  |        |       | £0 12 0               |
| <b>Cost of Blue Metal Toppings, per cubic yard .....</b>   |  |        |       |                       |
| 10 cubic ft. of blue metal at 12s. per 27 cubic feet .....   |  |        | 0     | 4                     |
| 6 cubic ft. blue metal at 7s. 6d. per 27 cubic feet .....  |  |        | 0     | 1                     |
| 1 cask of cement at 11s. 9d. ....  |  |        | 0     | 11                    |
|  |  |        |       | 0 17 10 $\frac{1}{2}$ |
| Cost of 15 cubic feet in place .....   |  |        | 1     | 12                    |
| Cost of a cubic yard .....   |  |        |       | 1 $\frac{1}{2}$       |
| <b>AVERAGE Cost of Compo. in Aqueducts.</b>  |  |        |       |                       |
| 383 cubic yards at £1 9s. 8d. ....   |  |        | 568   | 2                     |
| 1,150 cubic yards at £1 12s. $1\frac{1}{2}$ d. ....  |  |        | 1,848 | 12                    |
|  |  |        |       | £2,416 14 10          |
| Average cost per cubic yard = $\frac{£2,416 \text{ 14s. 10d.}}{1,533}$ = £1 11s. 6d. nearly.                                       |  |        |       |                       |
| <b>ESTIMATE of Cost of Contract No. 77 from Departmental Design and Schedule Prices, less 28<math>\frac{1}{2}</math> per cent.</b> |  |        |       |                       |
| 1,848 cubic yards of sandstone concrete, at £1 8s. ....  |  | 2,587  | 4     | 0                     |
| 1,054 " special bluestone concrete, at £3 .....  |  | 3,162  | 0     | 0                     |
| 1,859 " brickwork, at £2 10s. ....   |  | 4,647  | 10    | 0                     |
| 12,190 cubic feet of freestone ashlar, at 3s. 6d. ....   |  | 2,133  | 5     | 0                     |
| 2,682 square yards of cement facing, 1 to 1, at 2s. 6d. ....   |  | 335    | 5     | 0                     |
| 608 "                    "                    2 to 1, at 2s. 3d. ....  |  | 68     | 8     | 0                     |
| 92 cubic yards of tarred metal, at £2 8s. ....   |  | 220    | 16    | 0                     |
| 40 scupper slates at 2s. ....  |  | 4      | 0     | 0                     |
| 170 lineal feet of 4" scupper pipes, at 1s. 6d. ....   |  | 12     | 15    | 0                     |
| 14 cwt. manhole covers, fixing only, at 4s. ....   |  | 2      | 16    | 0                     |
| 56 cwt. T irons, at 4s. ....   |  | 11     | 4     | 0                     |
|  |  |        |       | 13,185 3 0            |
| Less 28 $\frac{1}{2}$ per cent. ..   |  |        |       | 3,757 14 6            |
|  |  |        |       | 9,427 8 6             |
| Add .....  |  |        |       | 6,362 2 0             |
| <b>Total cost.....</b>   |  |        |       | <b>£15,789 10 6</b>   |

ESTIMATE of the Cost of Contract No. 77, from Departmental Designs, and Professor Warren's Estimated Prices.

|   | £       | s. | d. |
|---|---------|----|----|
| 1,848 cubic yards of sandstone concrete, at £1 8s. ....       | 2,587   | 4  | 0  |
| 1,054 " special bluestone concrete, at £2 10s. ....           | 2,635   | 0  | 0  |
| 1,859 " brickwork, at £2.....                                 | 3,718   | 0  | 0  |
| 12,190 cubic feet of freestone ashlar, at 3s. ....            | 1,828   | 10 | 0  |
| 2,682 square yards of cement facing, 1 to 1, at 1s. 10d. .... | 245     | 17 | 0  |
| 608 " " 2 to 1, at 1s. 6d. ....                               | 45      | 12 | 0  |
| 92 cubic yards of tarred metal, at £2 5s. ....                | 207     | 0  | 0  |
| 40 scupper slates, at 2s. ....                                | 4       | 0  | 0  |
| 170 lineal feet of 4 in. scupper pipes, at 1s. 6d. ....       | 12      | 15 | 0  |
| 14 cwt. manhole covers, fixing only, at 4s. ....              | 2       | 16 | 0  |
| 56 " T irons, fixing only, at 4s. ....                        | 11      | 4  | 0  |
|   | 11,297  | 18 | 0  |
| Add .....   | 6,362   | 2  | 0  |
| Total cost .....  | £17,660 | 0  | 0  |

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QUANTITIES agreed upon for departmental design contract No. 77.

|  | £ | s. | d. |
|--|---|----|----|
| Sandstone concrete, 1,848 cubic yards.....         | 1 | 8  | 0  |
| Special bluestone concrete, 1,054 cubic yards..... | 2 | 10 | 0  |
| Brickwork, 1,859 cubic yards.....                  | 2 | 5  | 0  |
| Freestone ashlar, 12,190 cubic feet .....          | 0 | 3  | 0  |
| Cement facing, 1 to 1, 2,682 square yards.         |   |    |    |
| Cement facing, 2 to 1, 608 square yards.           |   |    |    |
| Tarred metal, 92 cubic yards.                      |   |    |    |
| Scupper slabs, 40.                                 |   |    |    |
| 4 inch ew. scupper pipes, 170 lineal feet.         |   |    |    |
| Manhole covers (fixing), 14 cwt.                   |   |    |    |
| T irons (fixing), 56 cwt.                          |   |    |    |

GEORGE McCREDIE.  
W. THOMPSON.  
J. DAVIS.

CONTRACT No. 77.—MONIER design aqueducts—Quantities agreed to by the undersigned.

|  |                      |
|--|----------------------|
| Material above skewbacks.....  | 1,533 cubic yards.   |
| Sandstone concrete in piers .....  | 1,350 "              |
| Bluestone .....  | 158 $\frac{3}{4}$ "  |
| Cement rendering inside and outside above skewbacks—1 to 1— $\frac{3}{8}$ inches thick ..... | 10,625 square yards. |
| " " below skewbacks—2 to 1— $\frac{3}{8}$ inches thick .....                                 | 1,016 "              |
| 140 expansion joints, cast-iron and bolts, each 2 $\frac{1}{4}$ cwt. ....                    |                      |
| Iron work exclusive of grids .....   | 18.2 ton.            |

GEORGE M'CREIDIE.  
W. THOMPSON.  
J. DAVIS.

21/7/96.

CONTRACT No. 77.—ANNANDALE.—QUANTITIES common to Monier and Departmental Designs in tunnels, roadways, &c., &c., not including aqueducts (30.02 chains).

| Item. | Description of Work.                   | Unit.         | Quantities. | Rate. | Amount.    |
|-------|--|---------------|-------------|-------|------------|
| 1     | Excavation.....                        | Cubic yards   | 4,243       | 2/-   | £ 424 6 0  |
| 2     | " .....                                | "             | 140         | 7/-   | 49 0 0     |
| 3     | " .....                                | "             | 1,160       | 6/-   | 348 0 0    |
| 4     | " .....                                | "             | 90          | 05/-  | 308 15 0   |
| 5     | " .....                                | "             | 100         | 60/-  | 300 0 0    |
| 6     | " .....                                | "             | 1,000       | 57/6  | 2,875 0 0  |
| 7     | " .....                                | "             | 70          | 6/-   | 21 0 0     |
| 8     | " .....                                | "             | 4           | 22/6  | 4 10 0     |
| 9     | " .....                                | "             | 70          | 20/-  | 70 0 0     |
| 10    | " .....                                | "             | 2           | 30/-  | 3 0 0      |
| 11    | Filling.....                           | "             | 2,300       | 1/-   | 115 0 0    |
| 13    | Sandstone ballast .....                | "             | 740         | 4/-   | 148 0 0    |
| 14    | Bluestone metal .....                  | "             | 370         | 12/-  | 222 0 0    |
| 15    | " screenings .....                     | "             | 180         | 5/-   | 45 0 0     |
| 16    | Subducts.....                          | Lineal yards  | 50          | 1/6   | 3 15 0     |
| 17    | Timber .....                           | Cubic feet... | 300         | 1/8   | 25 0 0     |
| 18    | Piling .....                           | Lineal feet.. | 960         | 4/-   | 192 0 0    |
| 27    | Curbing .....                          | "             | 650         | 2/6   | 81 5 0     |
| 26    | Ashlar .....                           | cubic feet... | 130         | 3/-   | 19 10 0    |
| 28    | Gully covers .....                     | each .....    | 4           | 18/6  | 3 14 0     |
| 30    | Bluestone pitchers .....               | square yard   | 8           | 12/6  | 5 0 0      |
| 31    | Freestone " .....                      | "             | 320         | 8/-   | 128 0 0    |
| 32    | Fencing .....                          | rod.....      | 50          | 18/-  | 45 0 0     |
| 33    | " .....                                | "             | 100         | 8/-   | 40 0 0     |
| 34    | 21-inch pipes .....                    | lineal yard.. | 120         | 33/-  | 198 0 0    |
| 35    | 12-inch " .....                        | "             | 20          | 6/9   | 6 15 0     |
| 36    | 9-inch " .....                         | "             | 15          | 5/-   | 3 15 0     |
| 39    | Surplus material .....                 | cubic yard... | 4,580       | 1/1   | 248 1 8    |
| 40    | Fixing ironwork .....                  | cwt. ....     | 125         | 4/-   | 25 0 0     |
| 41    | Flap traps .....                       | each .....    | 10          | 25/-  | 12 10 0    |
| 19    | Sandstone concrete .....               | cubic yard... | 322         | 28/-  | 450 16 0   |
| 20    | Bluestone " .....                      | "             | 707         | 50/-  | 1,767 10 0 |
| 22    | Brickwork .....                        | "             | 156         | 50/-  | 390 0 0    |
| 23    | Rendering 1 to 2 .....                 | square yard   | 2,835       | 2/3   | 318 18 9   |
|       |  |               |             |       | 8,898 1 5  |
|       | Deduct 28 $\frac{1}{2}$ per cent. .... |               |             |       | 2,535 19 5 |
|       |  |               |             |       | 6,362 2 0  |



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10607. *Mr. Davis.*] With reference to the 15 per cent. allowed for profit, risk, and royalty, what would you say is the usual percentage with which the contractor would be satisfied, as far as profit is concerned? I think 10 per cent. might be considered a fair thing.

10608. As to risk, I may inform you that it has been stated in evidence that the Department has entered into an agreement with Carter, Gummow, & Co., that it will pay 15 per cent. royalty upon any Monier arch the Department may construct;—with that fact in your mind, what would you say with regard to royalty. You have allowed 15 per cent. for profit, risk, and royalty—what would be a fair thing to allow for royalty? I have practically given nothing for the royalty. I have taken it that, this being the first occasion that a work of this kind has been constructed, the patentee should be prepared to make some sacrifice.

10609. You did not allow anything for royalty then? Of course, I knew there must be a royalty, and I knew there would be a risk. I knew that the contractors had to give a guarantee. I also considered the question of profit: and I have taken 15 per cent. as against these three items. Of course, if you are to add 10 per cent. for profit to 15 per cent. for royalty the amount would have to be 25 per cent., and that would include nothing for risk.

10610. As to the question of risk it has been stated in evidence that the bond into which Carter, Gummow, & Co. entered with the Department provided for a three years guarantee. You have not reckoned royalty at all. You have allowed 10 per cent. for profit and risk, deducting the profit. Do you think there is sufficient margin left to cover the risk. There is a three years guarantee of £12,000 a year? Of course, that is a big sum, 5 per cent. would give you £600 a year for three years. That would make £1,800 for the term. As regards these matters, I am, of course, open to correction. I have cut down the amount under this heading. Of course, under the circumstances you name, the contractors would be entitled to something more.

10611. It is usual to pay for risk? Yes.

10612. Supposing some one took the risk of a structure, which in this country might be regarded to some extent as novel, I suppose the risk would be worth something? Undoubtedly.

10613. And you have allowed only £380? I have only allowed that for everything.

10614. So that if more than that amount were allowed you do not think it would be out of the way? No; I do not.

10615. Coming now to the £6,362 2s., the estimate according to the schedule rate for the portions of the contract not included in the aqueduct. On 22nd June Mr. Thompson, in giving evidence as to the cost of the contract according to his estimate, handed in a document headed "Contract No. 77. Memo. of quantities outside of aqueducts—Departmental—including footings to the same not previously measured." He says, "I have checked the various items in the Government schedule, and I have so closely agreed with them as to adopt them here." What is the total amount? £6,362 2s.

10616. So that that is slightly in excess of the total which you have attached to your estimates? Yes.

10617. Might not that be accounted for by the note at the heading, where Mr. Thompson said, "Quantities outside of the aqueducts—Departmental—including footings, &c."? That would account for it probably. The sum would be about £300.

10618. You have had some experience as to what mixtures of concrete will make when deposited in the work, compared with quantities of the material measured separately on a concrete board? Yes.

10619. Would you say that the size of the stone had anything to do with the bulking of the concrete? Yes; it has a great deal to do with it.

10620. Furthermore, would you say that taking stone broken with a hammer—that is, knapped—and stone broken with a Blake's crusher, there would be any difference in the bulking? Yes; it would affect the quantity of small stuff, which would fill up the interstitial spaces.

10621. Would you say this—that it would depend entirely upon the size of the stone first of all, and secondly upon the proportion of small stone in any given size, as to what quantity there would be in the concrete in position? Yes; it depends upon that undoubtedly. The concrete is simply united by the cement mortar which fills up the interstitial spaces. The smaller stone would do that to some extent, and would therefore leave smaller interstitial spaces to be filled up with the cement mortar.

10622. Supposing you take stone of a 2-inch gauge and you mix a batch of concrete with stone approximately all that gauge, and suppose you have another batch of concrete mixed with stone varying from a 2-inch gauge down to the size of a pea, would the second batch make more in the work than the first? If you use small stuff to fill up the interstitial spaces it will go further. You will get a greater number of cubic feet.

10623. In other words, it amounts to this—that when you have all the voids filled with the compo. the balance of the compo. goes to bulk in the concrete? Yes.

10624. And the greater the aggregate used in proportion to the cement and the sand the less would be the bulk of the concrete in position? Yes.

10625. I have here a book by Mr. G. L. Sutcliffe, Associate of the Royal Institute of British Architects, upon "Concrete, its Nature and Uses." He says:—

The test No. 8 is one of a series given by Lieut.-Colonel Gillmore in his book on "Limes, Hydraulic Cements, and Mortars." He succeeded in obtaining aggregates with a minimum percentage of voids; ordinary limestone was crushed by a Blake's stone-breaker into pieces of all sizes below 2-inch cubes, and into various shapes; and gravel was obtained from the seashore, consisting, after the sand had been screened out, of pieces varying "from the size of a pea to that of a hen's egg." He found that the least amount of voids occurred in those mixtures which contained 15 measures of gravel and from 11 to 15 measures of broken stone. The worst mixture (15 to 27) contained only 30 per cent. of voids. The best (15 to 13) contained 23 per cent. This is a vast improvement on the voids mentioned above for broken stone of nearly uniform size. Solid concrete made from the latter would be 20 to 30 per cent. weaker than that made from the former, while the cost of the two would be practically the same. Roughly speaking the bulk of Portland cement is, according to Mr. Sandeman, reduced 10 per cent., and of sand 20 per cent., by mixing with water, and the contraction in volume caused by mixing sand and cement together is about 5 per cent. According to Mr. Sandeman, a further contraction of 4 per cent. takes place during the setting of the mortar. From these data we may calculate that cement and sand, 1 to 1, will produce mortar about 76 per cent. of their volume; 1 to 2 about 74 per cent., and 1 to 3 about 73 per cent.

Assuming that to be a correct statement, would you say that concrete made with an aggregate varying from 2 inches to a pea would be the better concrete? Yes.

10626. As to your experience, does it confirm that statement? Undoubtedly.

10627. So that if the stone used in this work has been broken with a Blake stone-breaker, and has varied from the size of a pea to 2 inches in the case of the sandstone concrete, and from the size of a pea to 1½ inch

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inch in the case of the bluestone concrete, you would approve of it? Yes. I say that, in view of the results of the testing of over 1,000 pieces of concrete. My test-book, which is in the hands of the Commission, will show the mixtures I have used. I think you will find in the book similar mixtures to those which you have described. No doubt that is the best way to make concrete.

10628. It is desirable to reduce the voids as far as possible? That is the way to get the strongest concrete for the least money.

10629. It would tell in the bulking also; would it not? Yes; it would make the bulk come out better.

10630. I have here another authority upon masonry construction, by Ira O. Baker, Professor of Civil Engineering, University of Illinois. He mentions the composition of concrete used in Boston Harbour—cement, sand, and gravel. The total materials used to a cubic yard of concrete amount to what? 1·27 cubic yards—0·83 bushels of cement,  $\frac{1}{4}$  cubic yard of sand, and 9-10ths of a cubic yard of gravel, at a total cost of 2 dol. 11 cents per cubic yard in place.

10631. The total quantity of the materials was 1·27 cubic yards? Yes.

10632. Baker gives another case of 10,000 cubic yards of concrete, as laid for the foundations of a blast furnace plant near Troy, N.Y., in 1886;—what quantities of material were used in that case? 1·23 bushels of cement, 0·10 cubic yard of sand, 0·36 cubic yard of gravel, 0·74 cubic yard of broken stone, making a total of 1·28 cubic yards. I notice that gravel and broken stone are mixed in that case. The total cost per cubic yard of the concrete in place was 3 dollars 52 cents as against 2 dollars 11 cents in the other case. These facts are taken from the Transactions of the American Society of Civil Engineers.

10633. *His Honor.*] It all comes to this,—that if you can so arrange your size of stone as to fill up all the interstices, and have no voids at all—making the body as dense as possible when the concrete is set—you make the best concrete? Yes.

10634. And if you find an increase in the bulk of the stuff after finally mixing or setting, it is to be presumed that the voids are all filled, and that the body is dense? Yes.

10635. It is good concrete then? Yes.

10636. If you find no increase in size you do not know whether the body is compact or not? Quite so.

10637. You cannot say how far it is wanting in compactness? It might be just short.

10638. It might be a good deal short for aught you know? Yes.

10639. And as regards filling up your interstices with stone, so long as the cement passes right through the whole body fairly and equally, and mixes with it, it is just as good a material as if the interstices had been actually filled up with cement? Yes; as long as each stone is covered with cement mortar. That is the point. Here, again, the adhesion of the cement to the material comes in and governs the matter. It is not the tensile strength of the cement.

10640. The object would be to get such a mixture of stone as would make the interstitial spaces an absolute minimum so long as there was sufficient room for a bonding quantity of cement to run right through it? Yes; that would be a perfect concrete. Of course the interstitial spaces vary slightly. The best thing is to try the materials at hand, and ascertain how you can best use them. That is always done.

10641. It is not good policy, then, in any relation to confine yourself to a single size of stone? No, certainly not. Then you use the maximum quantity of mortar, you get a weaker material, and it costs more money.

10642. You waste the cement without getting any advantage? Yes.

10643. *Mr. Parkes.*] In giving your evidence upon July 17th, you quoted from a number of authorities as to the strains upon brick arches, stone arches, and the Monier and other patents? Yes.

10644. Had you any means of finding out whether the material used in the arches to which you referred—taking the bricks for instance—was as good as that used here? They would be pretty much the same class of bricks.

10645. Have you seen the bricks? I saw a lot of brickwork and a lot of concrete work in Austria.

10646. Did you see these particular tests made? No; but it is stated that the materials were of the best description.

10647. You cannot guarantee the material in the same way that you could do in this Colony? No; it would probably not be as good as you would have here.

10648. Then so far as the quotations you made from various publications are concerned, they would have very little effect upon the case with which we are dealing? On the contrary, they would have a very great effect, because even assuming that the bricks in the arches were a little better or a little worse the result depends much more upon the cement mortar. That is one reason why a brick arch is less strong than a concrete arch. In a concrete arch you get over the joints. The results I gave are substantially correct. We should get similar results here if we repeated the experiments.

10649. Are not these tests made by those who are specially interested in the systems in connection with which they were made? No. In this case the experiments were made by a committee appointed by the Austrian Government—by several professors of engineering in universities, and by a number of leading architects and engineers. Of course the persons immediately interested would be certain to be represented—that is the case in all such tests.

10650. Do you know this of your own knowledge? Well, it is quoted in several books of the Proceedings of the Austrian Society.

10651. Have you the papers in your possession? I could obtain possession of them.

10652. Will you produce them? I will endeavour to do so.

10653. You yourself have made no tests of the Monier system other than those you made of the plates sent to you by Mr. Davis? No.

10654. Have you submitted your estimates to the Department before producing them to the Commission? No.

10655. Had you any conversation with Mr. Davis, or with any officer of the Department, between the time at which you agreed with Mr. Thompson and Mr. McCredie as to the quantities and the time of your coming here? No; I cannot remember that I saw Mr. Davis. I remember asking him about the 15 per cent. royalty, but I think Mr. Thompson was present at that time.

10656. When you gave evidence on a former occasion, you put down for the compo. which goes into the arches £1 7s. 6d. for material and 7s. 6d. for the iron mesh, making a total of £1 15s.? I think those are my figures, but I have not the memorandum by me now.

10657.

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10657. You put down labour at £1? Yes; I remember that item particularly.
10658. Does it remain at £1 in the report which you have made to-day? I made my estimate of £1 without taking anything like the trouble I have since taken. I have since been to the work three times. I have made measurements, and I am thoroughly satisfied as to the estimate which I now give.
10659. Do you think the work would cost £1 a yard;—do you not say in your report to-day that it will cost only 17s. 6d.? Yes; I think those are the figures.
10660. How many yards are there in each of the arches—there are about 25, are there not? I have not taken out the quantities in that way.
10661. Take an arch 78 feet long, 7 feet 6 inches in width, and 14 inches in depth—what would be the approximate measurement in yards? Say 24 cubic yards.
10662. Then, according to the estimate you have given to-day, it would take forty-one men to put the arch in? I saw fourteen men working at the time I was there.
10663. But were forty-one men working upon the arch? Not upon the arch I saw.
10664. You have mentioned in your report to-day twelve men? Ten men would be working at the spandrell.
10665. If ten men were working at an average of 5s. for two days, that would give £5 for the arch;—could not those ten men do the whole work? There were fourteen men engaged in putting the concrete into the arch. I have given only ten men, I think.
10666. Were all the fourteen men working upon the arch? Yes. Some were mixing the concrete, some were screening, others were wheeling it in barrows, others were receiving the contents of the barrows and so on.
10667. We will take fourteen as the average;—supposing you take £7 for the fourteen men, what would that run out to? That would be a little over 5s. a yard.
10668. Is not that a fair price for this work? You have not taken in the timbering and several other things.
10669. Is not 5s. a fair allowance for the work of putting in the arch;—supposing there were 14 men, could those men not put up the timbering and the ironwork on another day? I do not think so.
10670. Your average, according to the figures you present to-day, is 17s. 6d. per yard, including everything? Yes.
10671. Do you not think that is an excessive price? I do not, indeed.
10672. It would take, on the average, forty-one men to do the work, bit by bit, day by day, to make up your estimate of 17s. 6d. The men would be falling over one another? They are not all on the arch. Some would be on the platform, some would be working in the blacksmith's shop cutting up the iron, others would be engaged in putting the iron together.
10673. There would have to be forty-one men constantly employed upon the work to make up your estimate of 17s. 6d.; but you say that you saw only fourteen? There were fourteen doing the piece of work I saw. They were engaged upon the arch; but I suppose other men would be engaged in putting the iron together and making preparations for the next arch. It does not follow that all the men employed would be actually engaged in putting in the one arch which I saw being put in.
10674. But what would the other men be doing? They would be engaged in various other kinds of work which would have to be taken into account in making an estimate of the cost of the work as a whole. I take it, for instance, that the grid would be made by one set of men, and that another set of men would be engaged upon the compo.
10675. But you have said that the arch is all made in the one day? As regards the compo.
10676. Then the fourteen men who would be engaged putting in the compo. at a cost of 5s. would be idle while the arch work was coming on unless they were doing the ironwork. You have said that forty-one men were engaged? I did not say that.
10677. You will find that if you work out your 17s. 6d. it will mean forty-one men—do you not think the better plan would be to look at the contractors' papers and see what they actually paid;—would not that be the best method of arriving at the total? I suppose it would be.
10678. Did you watch the men working at any other time than the one day you have mentioned? I went down there three days. On one day they were not working.
10679. You have not seen the work in connection with one of these arches go right through—you have not seen the labour actually employed upon it? I have not seen all the work of course, but I saw how the work would be done. I saw that it was necessary, for instance, to make a grid, quite apart from the other work, and to bind it and shape it. That would be done the day before it was put into position, I presume.
10680. The work you saw done there on the contract on Thursday afternoon last was being done on a special occasion? Well, it was raining hard. I do not know that there was anything special about the occasion apart from that.
10681. How was the material put in—were the fourteen men you saw sitting on the arch? No. The men were on the scaffolding.
10682. Doing what? Putting in the material.
10683. They were all about the arch? Yes.
10684. With what were they putting in the material—with teaspoons? They were putting it on in the ordinary way. The barrow-loads were emptied, and the material was then spread out and rammed in.
10685. Rammed in with what? Rammers.
10686. Did it take fourteen men to put in with rammers the barrow-tippings of material? I saw fourteen men there at the work.
10687. How long were you on the works;—were you there an entire day? I was there about an hour.
10688. And fourteen men were then engaged upon the work? Yes.
10689. As to the timbering—you put down 10s. 6d. a yard for timbering;—do you still adhere to that, or have you altered the whole of your evidence? I have not altered any.
10690. Then you adhere to the 10s. 6d. you formerly gave for timbering? That estimate was made up from my own idea of the work, but I have since measured it up.
10691. How many centres were being used at a time? Four centres.
10692. Evidence has been given that only two centres are used at a time, and even supposing four centres are being used now, your estimate of 10s. 6d. is spread over the whole material, is it not;—is the timber left

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left in the whole of the four bays as the work goes on;—when they are making an arch would they have left the timber in all the other bays, or would it have been taken down? There were four centres standing there.

10693. But they are re-using the timber;—there is no doubt about that? They would require four centres for the aqueducts.

10694. How many were up when you were there? There were four about altogether.

10695. You mean fixed in position over the arch? In some cases they were ready for the building of the arch.

10696. How many were actually fixed in their places when you were there? Two were actually in use.

10697. The two centerings being actually in use in two arches, but you have taken 10s. 6d. per yard over the whole material? Yes; there were four centres, as I have explained.

10698. But you have taken 10s. 6d. for each yard of material? 7s. 6d.

10699. According to your former estimate it was 10s. 6d., but, taking it at 7s. 6d., what is your total? There are 732 cubic feet and 7,517 superficial feet in one centering. I have multiplied that by 4, and the total cost comes out at £561 8s.

10700. £234 for the timber in each bay, is it not? £140. I have estimated it for four.

10701. But only two of them, you say, were in place? I am supposing that four centres would be used.

10702. But there are only two in use? There are only two in use at present.

10703. That would be £234 for each bay? The two would come to £280.

10704. You have allowed £561 8s. for the timber? Yes.

10705. And there are only two bays being used? Yes; but they will have to leave those centerings in when they proceed with other arches.

10706. Why did they not leave them in before;—they are not in the work now, according to your own evidence? Two are under the arches; the other two are on the ground; but they are all practically in use.

10707. Two are in readiness for two more arches? Yes.

10708. But not in place? No. They are not turning more than two at the present time.

10709. And you make your estimate for timber over £500? Certainly.

10710. How much per 100 is that? 13s. per 100 superficial and 2s. 6d. for the cubic foot.

10711. You have charged as if it were the best of timber put in position? Goodlet & Smith's list, I suppose, would be a check.

10712. But is the timber left in position;—is it not used again? It is used in the centerings.

10713. As a matter of fact, have you not put in an excessive price? It is a good price, but it is not an excessive price.

10714. At all events, you have reduced your 10s. 6d. to 7s. 6d.? I do not think you ought to put it in that way. Since I gave my former evidence I have taken out quantities. On the former occasion I gave merely a rough estimate. This is a more exact estimate.

10715. Coming to the question of supervision, you have allowed, in your former evidence, 8s.;—what additional plant is there? There are two galvanised sheds and an office.

10716. Is the Government supposed to pay for those? Someone has to pay for them.

10717. Do not the contractors remove those buildings? Yes, but the wear comes to something, I suppose.

10718. What is the total you have put down for plant and supervision? There are two sheds and one office. I have put in tools and barrows, just as I have put in risk and guarantee, because I knew that these things would come in. I have given a lump sum of £150.

10719. What have you put in for supervision? I have assumed that the work would last twelve months, and I have allowed £375 for supervision.

10720. If the Government keep two or three inspectors upon the work, where is the necessity for your allowance for supervision? The contractor would supervise the work, I presume, on his own account. He would probably be there himself, and I suppose he would not work for nothing.

10721. But is the contractor paying at the rate of £375 a year for supervision? I estimated that to be the value of the work.

10722. But does he pay a foreman that amount—has he an inspector to whom he pays that amount? They ought to have.

10723. But have they? Yes; I suppose they have. I cannot swear that they have. Probably one of the contractors is supervising the work himself.

10724. What about the 10 per cent. profit—is not that additional £375 an altogether fallacious item? Not at all. Supposing one of the contractors does the work himself. It is worth so much, and any profit they get is additional. The contractors may have to borrow money from the bank. They may be running the contract in that way. I do not know.

10725. Is it an item which is put in the schedule? How could it be? I have endeavoured to estimate the work in this way: I have considered what it would be likely to cost me if I had to carry it out. I have considered what would be a fair price for the work.

10726-7. But is there a clause for supervision in the estimate of the departmental design? No; there are simply schedule prices.

10728. You have not put any fancy touches upon the departmental design;—what have you allowed in the case of the departmental design for material and plant? I did precisely as I was instructed—I took the schedule prices as I had them.

10729. But have you added the things I have just mentioned on to your estimate in the case of the departmental plan? I have used exactly the same schedule in the case of the departmental plan.

10730. Will you read your details and show me where you have added these things to the items in the departmental plan? I have taken the schedule.

10731. Let us have your detailed estimate in the case of the departmental plan;—did you put in the boxing in that case? No; because it is easy to arrive at a simple thing like that. I have to give the market price. I have not to use my own judgment. It was not a complex thing like the Monier arch, where I had to go through it bit by bit and see exactly what there was in the work.

10732. You have not made your two estimates, then, on the same basis? On precisely the same basis. I have shown you exactly how I have arrived at the prices. You have the whole of the details. It is easy to arrive at the value in the case of the departmental design, but in the case of the Monier plan you cannot say at once that it will cost so much per cubic yard. You have to work it out and discover what there is in it.

10733.

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10733. But it is a mere matter of material and labour in both cases, is it not? Yes; but in the one case we are familiar with the items, and there is no necessity to analyse the details to the same extent.
10734. When you were last under examination I asked you in regard to the elasticity of cement work, whether when the cement was over twelve months old there was any elasticity in it, and you said there certainly was. I afterwards asked you whether you could tell us of any space of concrete or cement work which had stood without cracking, and you referred to the southern section of the sewerage works as a case in point; have you seen that work lately? I saw it several years ago.
10735. To what work are you now referring? I am referring to the sewer which leads on to the sewage farm. It has been in use for some years.
10736. You are referring I presume to the sewer built by Mr. Bennett; but have you seen the outfall sewer going on to the sewage farm near Arncliffe? No. I saw those works some years ago, but a good deal has been done there since then.
10737. What is the length of the sewer Mr. Bennett built? I cannot say now. I was familiar with it at the time.
10738. Is there any great distance of aqueduct? It is not an aqueduct excepting towards the end.
10739. It is what is called an open sewer? No; there is some arching.
10740. But it is all under ground? Some is above ground.
10741. You have not lately seen the work which has been done in Contracts Nos. 101 and 112? No.
10742. I may tell you that the work upon Contract No. 101 is cracked from end to end? I should say then that there had been bad work.
10743. Does it not come from the shrinkage? I would not say that. I should say that it evidently came from bad work or bad material. Because a concrete sewer is cracked it does not follow that the concrete is a bad material for sewerage construction. It would show that in the instance to which you refer the necessary precautions were not taken. It is very unfortunate that there should have been bad work or bad material, but that does not warrant you in saying that concrete should be condemned as a material for such purposes. The suitability of concrete as a material for arches, sewers, and foundations, and for all the purposes for which it has been used, is established. It is used more than any other material for that kind of work.
10744. *His Honor.*] The question is whether either blue-metal or sandstone concrete, exposed to the weather, does not expand and contract very appreciably with changes of temperature—I believe it has been proved that it does expand and contract at about the same rate as does iron? Concrete does not expand and contract quite so much as does iron, but compo. would expand about the same as iron. Brickwork and stonework do not expand quite as much. The expansion of stone is about one-half that of iron.
10745. It has been found, by experiment, has it not, that iron, bedded in concrete and heated up to a high temperature, will not break away from the concrete in which it is bedded? That has been proved by Bauschinger, at Munich. It has been proved by getting up a furnace heat and then putting a shower bath on to the material.
10746. That being the case, a long length of concrete, having no opportunity to contract without cracking, would be likely to crack;—if, for instance, it were built in the summer, it would be likely to crack by contraction some time in the following winter? Yes; assuming that the elasticity of the compo. were not sufficient to withstand the stress that would be developed during the changes of temperature. Concrete, however, is an elastic material, and so is compo. There is no doubt whatever about that.
10747. *Mr. Parkes.*] Does compo. expand after it has been twelve months in position? If you mean that it will expand with heat and contract with cold, yes, certainly.
10748. Then it would crack? Not necessarily; it may be elastic.
10749. Supposing it were tied at both ends? Then it will develop stresses. Look, for instance, at an iron arch, which is rigid between the abutments; it contracts and expands; it will rise at the crown, but in doing so it will put an enormous stress on all the other parts of the arch amounting to 3 tons to the square inch.
10750. That is only a short length? There is one case of a work of that kind 840 feet long.
10751. That would have a roller bed? The same principle applies; it will expand under heat, and you say that it must break.
10752. You must give room for contraction and expansion in all iron construction, must you not? Nothing is absolutely rigid.
10753. You spoke on a former occasion of the porosity of cement—the sewer to which I have referred shows a uniform leakage through the cement and concrete? If there is a leakage, the work has not been properly rendered. I may mention that in Queensland Mr. Stanley has for many years used concrete in the arches of railway bridges and tunnels. Concrete has recently been adopted here in railway tunnels.
10754. As to the risk in the case of Contract No. 77, do you think it a fair thing that the Government should be called upon to pay for the risk in connection with the substituted plan? That is included in my item of 15 per cent. I had to make an estimate in connection with the entire work; but I am not an expert in every department. I have divided up my estimate so that you might have an opportunity to check and examine it.
10755. As to the making of concrete—you have given evidence to the effect that small stones may be put in as long as they fill up the interstices and there is sufficient cement in between them; but, as a matter of fact, when the specification sets forth that so much stone, so much sand, and so much cement, shall be used, ought it not to be carried out—for instance, the proportions are given as 7, 3, and 2; 4, 2, and 1; and 5, 2, and 1? Those proportions should be put in, unless the engineer makes an alteration.
10756. The substitution of the small stone tends to eliminate the cement? No, not exactly that. It means that you use less cement-mortar, because you do not require as much.
10757. You have not made any particular test yourself, with a view to carry out the specification of the Government, in connection with these contracts? I have mixed a good deal of concrete in the proportions you have named.
10758. But have you made any tests with the concrete provided in these specifications? I think so. I think I could find a number of tests which would compare with the 7, 3, and 2, to which you have referred.
10759. But have you specially made any tests in accordance with these specifications? I have not had the specifications before me; but I think I could find in my test-book twenty or thirty tests which would correspond exactly with these proportions.
- 10760.

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10760. Would you so make your concrete that the sifting would be done through a  $\frac{1}{2}$ -inch sieve? No.
10761. You would not make concrete in that way? No.
10762. *His Honor.*] The question is this—Is it a proper thing, if the specification provides some maximum for metal, to propose that the metal for concrete, exclusive of the question of maximum and for the sake of getting rid of the small stuff, shall be screened through screens of an  $\frac{1}{8}$ -inch gauge;—does that sufficiently get rid of the small stuff that ought to be got rid of in what is called the stone, considered distinctly from the sand? The usual thing to do is to use a sieve to get rid of the smallest of the stuff in your stone. The size of the stone would vary from the size of the sieve up to the maximum size. I see no objection to that. It is commonly done.
10763. *Mr. Parkes.*] But how would you get rid of the smaller stuff? Sometimes one does not want to get rid of it.
10764. Ought not the stone to be forked? Not necessarily. You often do more harm than good by taking the fine stuff out.
10765. Would you put in the small pieces forming the residue from the  $\frac{1}{8}$ -inch sieve? I should not object to it myself; it would not affect the strength of the concrete.
10766. What I mean is this—if an  $\frac{1}{8}$ -inch sieve were used, you would not object to the use of anything which would not go through the sieve? Quite so.
10767. But what about the sand? You would have to put in less sand if you worked to the specification. Of course, if you deviated from the specification very much, in regard to the quantity of small stuff put in, some allowance would have to be made when you were putting in the sand. The putting in of the small stone would not do any harm. A great deal would depend upon the interstitial spaces which would have to be filled up.
10768. You would not put in the full quantity of 2 to 1 of sand? The quantity of sand would depend upon the quantity of small stuff put in.
10769. Have you seen the Monier work which is being done in connection with Contract 112? No; I have heard that some work of that kind is going on, but I have never been upon the work myself.
10770. *Mr. Davis.*] In connection with Contract 77 you have allowed £375 for supervision? Yes.
10771. Suppose that instead of extending over twelve months the contract extended over eighteen months? Then the supervision would be worth more. I took it at twelve months. It is one of those items which men will estimate differently.
10772. Suppose it has been given in evidence that not only has one of the contractors themselves been supervising the work, but that, for a portion of the time at least, they have employed an engineer? I think that would show that the supervision had actually cost more than I have put down for it.
10773. Referring to the bulking of concrete, Mr. McCreddie when being examined gave the following evidence:—

Will you tell His Honor what the mesh of the screen is according to the specification? Clause 26 says:—“Sandstone concrete, where ordered to be used in these works, to be composed of one part of Portland cement, two parts of sand, and five parts of sandstone (as specified under clause 16) metal, free from dirt, quarry refuse, sieved (as specified in clause 18), washed, and of a size to pass with its largest dimensions through a ring of 2 inches in diameter. All materials to be mixed in the same manner as hereinafter specified for concrete.” If you turn to clause 18 you will find the following:—“Broken stone for bluestone concrete to be of basalt or other similar hard stone of approved quality; to be broken by hand or crushing machine, of a size to pass freely with its largest dimensions through a ring of  $1\frac{1}{2}$  inches in diameter; the whole of the metal to be free from dirt, quarry refuse, &c.; to be screened through a sieve of meshes  $\frac{1}{8}$  inch apart, and then to be washed with fresh water until approved, before it shall be deemed fit and suitable for these works.”

Supposing the metal has a maximum size in the case of bluestone of  $1\frac{1}{2}$  inches, and in the case of sandstone of 2 inches, and that in order to eliminate the sand and very small particles of stone the material is passed over a sieve or screen having a mesh of an eighth of an inch, do you think that would comply with what I have read to you? Not strictly, perhaps, with what you have read, but it is the usual practice to make concrete in that way.

10774. Would that not make the best description of concrete? Undoubtedly.
10775. Is it not a fact that, in order to get the concrete as impervious as possible, where there is a big head of water, it is usual to put in shivers in addition to the small stone which is found in the broken stone itself? Yes. In the case of bluestone with shivers, one cask of cement, three of sand, and six of stone will make about 33 feet of concrete. There would be a good proportion of shivers; the 2 inches in one of the cases you have referred to would be the maximum. You would then have the stones going down to about an  $\frac{1}{8}$  inch in size. In my cement room I have drawers full of different sized material which I mix in making concretes.
10776. Would it be exactly fair to take one experiment, or even a dozen experiments, to arrive at even an approximate conclusion as to what concrete would make in position? It is very difficult indeed to say. You have to vary it. You should try the particular material at hand to see what it will do. You cannot say absolutely beforehand what it will do unless you have made an experiment with something very similar.
10777. The size of the stone from the crusher will vary every day, and therefore the bulking will vary? Yes, of course; the proportion of material which you call shivers, which would be with the stone, would vary.
10778. *His Honor.*] I suppose the machine would break into sand, as a general rule, any single small particle which did not retain its soundness as a single stone. Take small stones which have been nearly broken up, and which are ready to go to pieces easily; would those particles go into sand before the screening took place, or would they, as a rule, remain small pieces of stone on their own account? I do not think so; some of them would be smashed.
10779. If you prepared the stone for concrete by screening it through a  $\frac{1}{8}$ -inch screen, would the quantity which did not pass through the screen if the screening were properly done consist pretty universally, however small they might be, of sound pieces of stone? Yes, I think so.
10780. Not many pieces on the point of disintegration? No.
10781. You think the pieces on the point of disintegration would be disintegrated by the action of the screening? Yes.
10782. So it would come to this—that the concrete made of this material would be concrete consisting of bits of the original rock, the sand, and the cement, and its hardness would depend upon the hardness of the particles of the original rock, however small? Yes.



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10783. The smallness of the particles would not weaken the strength of the whole result? No.
10784. The only effect would be that the body of stone would absorb less sand and less cement, or less compo., made of sand and cement? Yes; and, if you tested it, as I have done frequently, you would find that you often get better results with these smaller particles than without them. You get better results, because you get a more compact concrete.
10785. *Mr. Davis.*] As to the sand which is being used in Contract 77, you have been upon the ground, you say? Yes.
10786. Did you examine the sand which was being used? Yes; I took some away. As I have already explained, I went down to the works once, when there was no one there at all. I was at both White's Creek and Johnstone's Creek, and I took pieces of stone here and there in my endeavour to discover the nature of the material they were using. I have found it fairly good sand compared with some standard crushed stone sand at the University. I did not test it with cement, but I tried to find out the quantity of dirt in it, and I found that it came out just about the same as some good crushed sandstone of which I had samples.
10787. *Mr. Parkes.*] Is not concrete generally forked so as to get out the small material? I have seen it done, but as a rule an ordinary shovel is used.
10788. The general way of getting the gauge of concrete is to pass it through a  $\frac{3}{4}$ -inch sieve is it not? There are several sieves—a  $\frac{3}{4}$ -inch sieve would be rather a large sieve. The sieve used would depend upon the material with which you are dealing. It would depend upon whether you wanted to get anything into the concrete smaller than the mesh of the particular sieve.
10789. Cement is the strongest portion of the concrete is it not? It depends upon the adhesion of the cement to the sandstone or bluestone.
10790. But the cement and sand when combined are the strongest portion are they not? Up to a certain time they are; but sometimes you get pieces which break right through the mass of stone itself—that is to say the stone itself will break in two. More generally the cement pulls away from the stone.
10791. *His Honor.*] Which is the harder—ordinary Kiama basalt or compo.? Of course if you test basalt in that way the compo. will always pull away from the basalt. You will never break the stone in that case.
10792. The basalt is the harder material, both for tensile and crushing strength? Yes. I do not remember a case in which I have broken a piece of bluestone in a test.
10793. *Mr. Davis.*] Do you know the crushing strength of good Pymont sandstone? 5,000 lb. to the square inch.
10794. What is the crushing strength of compo, at say one month? 1,500 lb.
10795. So that the stone would be the stronger? If you take old concrete where the cement has had time to harden thoroughly—say concrete two years' old—and put it into the machine sometimes you get the stone broken in two, but it sometimes happens that you do not put the best Pymont stone into concrete. You may come across a piece which is not strong, and that, of course, will fracture across.

Joseph Davis recalled and further examined:—

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10796. *Mr. Parkes.*] Will you read clauses 93 to 102, dealing with cement work, in the specification of Contract 79A? Yes.

*Concrete Works.*

93. The concrete to be used in foundations of sewer, and in arching and building round stoneware pipes, packing over brick arch in tunnels, where ordered, and in sumps, to be of sandstone concrete of the quality specified in clause 26. The concrete to be used for all other works in sewers, junctions, chambers, shafts, manholes, &c., unless where otherwise directed, to be bluestone concrete of the quality specified in clause 24.

94. The contractor to find, provide, and make at his own cost, all concrete boxes, centres, staging, shoring, planking, &c., of the exact forms, shapes, curves, &c., required, in a proper, secure, and substantial, manner, due allowance being made for  $\frac{5}{8}$  inch thick cement facing over all internal exposed surfaces of concrete work; and great care being taken that all centering and concrete boxes can easily be withdrawn, except where otherwise directed. The designs for centering, concrete boxes, &c., are to be approved by, and to the entire satisfaction of, the Engineer. After completion of any portion of the concrete or brickwork, the concrete boxes and the centering, as the case may be, shall not be removed until the Engineer or his Superintending Officer has given written permission to that effect.

95. The concrete, after it has been approved of, to be conveyed to the work as may be directed, and as shall be approved of, and tipped into same and upon the surface of each layer from a height not exceeding 18 inches. Commencing at each part of the work at lowest level of excavation, the concrete to be brought up in horizontal and even layers, and on lines of sewer, branch and pipe sewers, junctions, gas-check and shaft chambers, inspecting chambers, &c., unless where otherwise directed, in even layers parallel with specified longitudinal gradients of works; each layer, when spread, to be 9 inches thick throughout before ramming, and, after spreading, to be quickly and evenly rammed all over until approved of, and then allowed time to set before the succeeding layer is put on.

96. After the concrete has been carried up to the level of springing, all concrete arches to be commenced at both walls or abutments simultaneously, and carried on towards centre line in radiating parallel strips, spread 9 inches thick, of the whole width of arch, or in lengths as specified in clause 107, as shall be directed at the time, and rammed as before described, and, where the arch is thicker than 9 inches, the lower layer to be always completed throughout, 12 inches in advance of the upper succeeding layer, and then allowed time to set and harden before the succeeding layer is put on.

97. After completion of the brick closing-arch, all bluestone concrete work above springing of same, at sides of arch, in manhole chambers, gas-check chambers, shafts, &c., to be carried up in the same manner as specified in clause 95, and of exact dimensions, curves, and thicknesses, &c., as shown on drawings.

98. No portion of the concrete work described in the previous clauses (unless otherwise directed in writing) to be covered up with earth or brickwork until it has been examined and approved of by the Engineer. Any leakage that may appear in each layer to be carefully attended to and be made good and repaired at the time, as shall be approved, before each succeeding layer is put on.

99. All end faces of layers of concrete to be stepped back at each respective length of sewer or other work, as shall be directed: to be carefully washed clean with fresh water, and then to be grouted, prior to each layer of the adjoining length being commenced and joined on to the same.

100. After the lower layer has set to the satisfaction of the Engineer, its top surface to be carefully washed until approved, and then to be grouted all over, prior to each succeeding layer of concrete being put on.

101. In the event of any stoppage occurring to the work, from whatever cause, or in anticipation of rainfall, the contractor, before temporarily stopping work, shall finish it off at whatever level the work may be raised at the time, by thoroughly grouting the whole of the surface with cement grout.

102. In all cases where a layer at mid-day or at evening is left incomplete, the said layer shall not be continued after any stoppage until the surface of the lower and the end of the upper layer have been washed clean and then grouted with cement grout.

10797. This specification will be the same in all contracts? Not necessarily.

10798. It is the same in Contracts 79 and 79A? Yes.

10799.



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10799. Taking the constructional clauses as to building layer by layer—is it not your custom first of all to put 9 inches upon the floor of the excavated tunnel from one shaft to another? No.
10800. Ought not that to be done according to the specification? I do not think so.
10801. Then what is the use of these details as to construction in the specification? There are qualifying clauses all through. They occur again and again. For instance, you will frequently see the words “unless where otherwise directed.” Not only so, but it is known in the Department that in works of this description the engineer must necessarily have certain discretionary power. The clauses are there to be put into operation supposing they apply and it is advisable to put them into operation.
10802. Are they not put into operation in the case of some contractors? I am not aware that one contractor is treated differently from another. The officers of the Department are instructed to administer the specification intelligently—in a fair and reasonable way.
10803. Do not you yourself insist upon having your concrete forked with a ten-pronged fork? No.
10804. Have you not given orders to contractors to do that? I have frequently said this—that I would not allow sand to go in with the stone. The specification does not admit of objection to anything beyond actual sand. As to my asking the contractors to fork, I have no power to do it. It has frequently happened that the contractor has asked permission to fork, and in some cases he has been allowed to do it. They had generally screened the portion of the metal containing the smaller particles, say up to three-quarters of an inch, the sand only being rejected.
10805. *His Honor.*] When you say that contractors have asked leave to fork, do you mean forking in substitution for screening? Yes; it has happened frequently. It is to save the contractors putting over the screen the whole of the metal. Say the forking has raised 90 per cent., and 10 per cent. has been left behind. This has been passed over the screen to eliminate the sand, and the small stuff which has been retained by the screen has been used in the concrete. In the case of 118, and also 77, where the sandstone was crushed on the ground, a revolving screen was used, so that there was no forking in that case.
10806. Where would the revolving screen be? At the mouth of the crusher. It would probably be a quarter-inch mesh.
10807. *Mr. Parkes.*] Would it not be a half-inch? No; but I should say that in a revolving screen, to get out the sand, you would have to have a larger mesh than an eighth-inch. The object of the screening is to eliminate the sand. If the sand goes in it weakens the concrete.
10808. In one clause of your specification you say that the stone is to pass through a ring of 2 inches;—is not the intention of that clause that that shall be the average size? No; the reading of that clause, since I have been in the Sewerage Department, has been that the largest size of the stone must not be more than 2 inches, and, to ascertain that, the words “2-inch ring” are used. It may be flakey—only a quarter of an inch thick—but it must not be, from angle to angle or end to end, more than 2 inches or  $1\frac{1}{2}$  inch, as the case may be.
10809. In building the invert to the sewer, before you put your centers in you put in some concrete? As I explained previously, the practice has been in the case of these tunnels to put in, at about every 5 feet probably, a couple of shovelful of concrete, heaped up together, so that you would have a surface on the top of the pat 6 x 6 or 6 x 9. Some of the pats are 4 x 4. These pats are allowed to set, and the centering then goes in. No concrete is put into the tunnel before the centering goes in, with that exception. The centering is built with the sewer. It is not a complete centre. The ribs are bolted to cross-pieces, and lagging is put on to the ribs. The centering is constructed as the sewer is constructed—that is, as the concrete goes into position.
10810. *His Honor.*] The lagging does not go in on the centering? As the concrete is brought up on each side the lagging goes into position.
10811. *Mr. Parkes.*] Why do you make a specification such as this;—why do you go into such detail if you do not intend to carry it out? We not only intend to carry it out, but we have carried it out.
10812. Supposing the contractor does a certain quantity, as you say—supposing the entire invert is carried on for 100 feet or 200 feet—and that he then stops and recommences the work the next day, he recommences with an upright joint? They do the sewer up to the springing as far as they can in one day. It may be 2 or 3 chains, according to the thickness of the concrete. Then they stop, and the work is stepped.
10813. But they have an upright joint? It is stepped in accordance with the specification, and then, before the work is recommenced on the next day, it is grouted.
10814. How much concrete work would they do in a day in an invert? I can tell you how much a gang of concretors will do, but how far the concrete will go depends upon the thickness of the concrete and the size of the sewer.
10815. How much would a gang do? They would probably put in from 12 to 15 cubic yards a day.
10816. But how many running feet? About a chain, I think. It would depend upon the size of the sewer.
10817. There would be a joint at about every chain then? Yes; the joints would vary with the size of the sewer, and a number of other things would have to be considered.
10818. In your concrete work you provide for all the centering and boxing, and everything of that sort, do you not? We provide for everything which is requisite to carry out the work.
10819. Supervision and everything? Yes; by inference.
10820. You put nothing in for contractor's profit? We do not put it in; and if the contractor does not put it in we do not object. We leave that to him.
10821. The bluestone concrete runs at about 50s. in the case of Contract 79A? Yes.
10822. That includes everything? Yes.
10823. In the case of Contract 79 the price is also 50s.? Yes.
10824. In the case of Contract No. 69 the bluestone concrete is put down at 43s., is it not? Yes.
10825. And the special bluestone concrete, including ironwork and everything, in the case of Contract No. 112 is put down at £2 15s.? I could not say at this moment; but as to Contracts 79A and 79, where the price of bluestone concrete is 50s., and Contract 69, where the price is 43s. the two works are different. There is a different size of sewer; it is considerably larger in the case of Contract 69. The work in that contract in connection with concrete would be less than in the case of 79A, and so the price is less.
10826. The price of 50s. is your own estimate? Yes.

- J. Davis. 10827. Take the cement at 12s.—that would leave 38s. for the metal and sand—how do you make up the total? You are assuming, first of all, what is scarcely the fact, and that is, that a cask of cement will only make a yard of concrete.
- 3 Aug., 1896. 10828. But you say so, do you not? I do not say anything about it.
10829. Your statement is that a cask of cement will make only a yard;—that is your own evidence? I have simply quoted from the authorities.
10830. That being so, it leaves 38s. for the sand and stone;—how do you make up that amount? I suppose you are assuming that it takes a cask of cement to make a cubic yard of bluestone concrete.
10831. I am taking a barrel of cement at 12s., and that leaves 38s. to be made up of the other material. I want to know how you make up the amount;—what, for instance, is the value of the 16 feet of metal? I should say it would cost from 11s. to 12s. a ton delivered on the works.
10832. What is the worth of the 16 feet? Well, the metal costs from 11s. to 12s. per ton.
10833. What is the worth of the 8 feet of sand? It would be worth, say, 7s. 6d. a yard.
10834. There would be a third of a yard of sand; therefore you are taking 38s. to represent sand and bluestone metal which would be worth about 15s.? I said that the stone would come to from 11s. to 12s. per ton.
10835. Would the 16 feet of metal take a ton? No.
10836. How do you make up the 38s.? You will have to add 12s. for the cement.
10837. I have already allowed for the cement. I suppose the labour would not cost 25s.? No; it would not be worth that.
10838. It would be worth 5s. according to Professor Warren, but it would be worth about 3s. as a matter of fact. I should like to know how you make up the balance? You have set me a task which amounts to justifying some one else. If you ask me to give you an estimate of the value of bluestone concrete I will do so.
10839. Do you not by your specification intend that the metal shall be broken to an average of 1½-inch gauge? Most decidedly not. I would never object to metal on account of its fineness as long as there is no sand or dirt in it.
10840. The cement is the most valuable material in the composition. It is worth four times as much as the other component parts and more. I would like to know how you make up your estimate? It is made up in the usual way. You get, approximately, at the material that will be used. You then estimate the amount of labour. Then there is the centering, plant, risk, profit, and supervision.
10841. But all these things will not make up the 38s.;—as a matter of fact, do you not always calculate in the Department that one and three-quarters of a cask of cement will go to each yard of concrete? I should say that if anyone had made an estimate of that description, it would be ridiculous. It would be much better for you to ask me what I estimate.
10842. What is the regulation estimate? There is no regulation.
10843. What do you estimate? My estimate would vary with the size of the stone.
10844. What do you estimate, according to your own gauge;—what is your own estimate, taking the bluestone concrete for instance? It would vary in relation to the position of the concrete.
10845. Take an ordinary yard? As I say, the estimate would vary with the position in which the concrete is put. Supposing you were putting in the concrete horizontally, then in all probability a cask would make more in measurement than if you were putting it in between the four boards of a pier.
10846. How much would it make if the concrete were put in horizontally? I should expect it to make probably 23 feet.
10847. How much would it make if the concrete were put in in the ordinary way in which it is put into the invert of a sewer—take sandstone concrete for example? I shall have to preface my answer with the explanation that it would depend, first of all, upon the size of the stone and then upon the position in which the concrete would be put in.
10848. But take your own specification? I have the sewerage specification in my mind. Take a mixing of sandstone concrete composed of 5, 2, and 1. The cask of cement, we will assume, to be 4½, the sand 8½, and the stone 21½. Those materials added together give 34½, that is before they are wet.
10849. You had not allowed for disappearance? I am coming to that. That concrete would make in some cases 27 feet, in others 28 feet, in others 29 feet, and in others over 30 feet.
10850. Would it vary like that? Yes.
10851. Is not that a sort of fancy work? No; it is what you might reasonably expect.
10852. Then what is the good of your having gauges or anything of that sort if you do not stick to them? We do stick to them.
10853. Will you read clause 107 of the specification to Contract 79? Yes; it is as follows:—
107. The concrete and brickwork of sewer in tunnel to be commenced, in accordance with clause 79, in the different lengths of tunnels, and to be carried on in each from each end simultaneously, in not less than three continuous lengths of 16 ft. 6 in. each—that is to say, when the arching of the first 16 ft. 6 in. commences the next 16 ft. 6 in. length must be in progress from height of invert up to the springing of arch, the third 16 ft. 6 in. length must be in progress between floor of tunnel and level of invert of sewer, and in the fourth 16 ft. 6 in. length the excavation and timbering of tunnel must at this time be completed and ready to receive concrete foundation of sewer.
10854. Is that ever carried out? It has been in some cases, but not frequently.
10855. With reference to the shrinkage of the concrete in Contract 101, why did you specify in that contract for an iron grid? There is in one of the general clauses provision made for bond rods.
10856. The same as Mr. M'Sweney is using in Contract 112? No; not like that work.
10857. His specification is identical, is it not? No; it is a different specification altogether.
10858. Does not this particular clause read in the same way? I do not think so. In the specification of Contract 112 there is detailed provision made for these bond rods, which is not made in connection with Contract 101.
10859. Why were not those clauses inserted in the case of No. 101? I cannot say at this moment, but if you will defer your question I will endeavour to answer it.
10860. I was going to ask you whether it was in your mind that it would have prevented the cement from cracking? I do not think it would. I have a strong opinion as to the cracks in that sewer, and indeed with reference to the cracks in concrete work as a whole. I do not think bond rods would have prevented the contraction. I think it might have broken the bond rods.
10861. You think that all concrete will shrink? I do.
- 10862.

10862. Do you think that the contraction of the concrete will break the bond rods in the case of the Monier contract? Provision is made in the Monier system for expansion and contraction. J. Davis.
10863. How is it made? In the case of the Monier system the elasticity of the arch is considerably more than would be the case with concrete. Aug., 1896.
10864. What about the carrier? And in the carrier also, seeing that it is so thin and is composed of 10 per cent. of iron or thereabouts, it would be much more elastic than an ordinary concrete structure.
10865. There must be a resistance in the iron to the shrinkage of the concrete? The iron and concrete will expand and contract in about the same ratio.
10866. How would the concrete come to fracture the iron—to tear it asunder? I suppose the iron would not be able to accommodate itself to the temperature. A tensile strain would be set up, and that would probably break small rods.
10867. What extra provision is made in the case of the Monier system for expansion and contraction? There are cross-cuts in the carrier over the piers of the arch.
10868. What are those cross-cuts? They are intended to provide for contraction and expansion. The theory is that when the structure contracts the crown of the arch will be slightly lower, and that when it expands it will rise again.
10869. Will not that open the aqueduct? It might have done so. The structure might not have been sufficiently elastic, but, in addition to the elasticity of the structure, provision is made in the cross-cuts of which I am speaking.
10870. But will the expansion and contraction not open the carrier? It could not possibly do that because of the cross-cuts of which I have spoken.
10871. With what are they filled? Mastic.
10872. Everything depends upon those mastic joints? For watertightness at those points.
10873. What would be the difference between the cost of an iron pipe run across instead of a concrete carrier? I could not say off-hand what the difference in cost would be, but I can tell you what was done before the structure was decided upon. An estimate was made for iron pipes at Mr. Hickson's request—that is, a single iron pipe. That was done some years ago when Mr. Bagge was in charge of the office, and it showed that iron pipes would be more costly than a brick and concrete structure.
10874. Very much more costly? Certainly more costly, but I could not say precisely what the difference in cost would be.
10875. Could you obtain that estimate? If it is to be found. I will certainly look for it, but the estimate was made some years ago.
10876. Was it shown that the iron pipes would be 10 per cent. more costly? I should say so, certainly.
10877. Would the difference be more than 10 per cent.? I could not say. If you made an estimate to-day the result might be different. Of course the price of iron would vary.
10878. Iron is cheap just now? Yes, it is low just now.
10879. An estimate could be made now I suppose applying to last year—that is, showing what it would have cost last year to take an iron pipe across these aqueducts. A comparison could be made between the cost of an iron pipe and the cost of the Monier carrier? Yes, certainly. I may mention that when the aqueduct at Johnstone's Creek and also at White's Creek was taken into consideration, Mr. Hickson had prepared a comparative estimate showing what the sewer would cost carried out with brick and concrete, and also with a pipe on piers, and the conclusion arrived at was that the brick and concrete work would be the cheaper. The original design was then made, but it was a little too costly for Mr. Hickson's ideas.
10880. *His Honor.*] That was the expensive design which was cut down to the departmental design for Contract 77, leaving out the top railings and several other things? Yes.
10881. *Mr. Parkes.*] Could you produce the estimate of which you have spoken? I will endeavour to find it.

William Thompson recalled and further examined:—

10882. *Mr. Parkes.*] You have made out with Mr. M'Credie an estimate of the quantity of cement which would be required in a given quantity of concrete as shown by some tests, have you not? Yes. W. Thompson.
10883. Will you describe to His Honor how you mixed the concrete? I think it is described pretty fully in our report. We first had the stone gauged to the right size. Then we washed it by placing it in a barrow half full of water, and it was roughly washed. We then took it from the barrow, and forked it out on to the platform. It was then put into the gauge box to get the right proportions. We used a 4-ft. gauge box to determine the proportions of stone, sand, and cement, and laid one upon the top of the other as specified. The materials were then thoroughly mixed and put in a gauge box of one yard capacity. Aug., 1896.
10884. Why did you fork it? For the convenience of handling it.
10885. Do you know if forking is the method generally adopted under Government inspectors? Yes.
10886. How do you know that? From my experience. I know that forking is the usual method of handling ballast. We lost nothing to speak of by the forking, in putting the stone from the barrow into the gauge box.
10887. Was there not any residue? Very little, except dirt and rubbish.
10888. How many prongs were there in the fork? I think six, but I could not be sure upon that point.
10889. Did you ever hear of concrete being made out of material which was screened over a  $\frac{3}{4}$ -inch screen? I think in this case 2-inch stone was specified, and I take that to mean that the stone is to be as near to 2 inches as you can get it.
10890. That is the object of the specification as to gauge? Yes; I think so.
10891. If you had put in all the residue—that is, all the small stone—you would have greatly increased the bulk of the concrete? Not greatly; there was a great deal of inch stone put in. It was not by any means all 2-inch. It would range from an inch upwards.
10892. Suppose there were a specification signed for concrete of 3, 2, and 1, you would not expect to find the metal of all sizes up to a certain gauge to the exclusion of cement? In mixing those proportions if you took three boxes of ballast you would have to take one box of cement.
10893. Therefore in the gauge box there could be no escape as regards the quantity of cement? No; not in the gauging.
10894. Supposing the small stones were put in they would only crowd out of the gauge box, to a certain extent, other stones;—supposing the stone were a  $\frac{1}{2}$ -inch instead of an inch there would be a greater number

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- number of interstices to fill up, would there not? The smaller stone would help to fill the interstices. Our three-quarter stone ran from an eighth-inch to three-quarters, but it only increased the bulk one eighteenth.
10895. Unless the stone were of a very flat or flaggy nature there would not be a great deal of difference in the consumption of cement? Not a great deal.
10896. You feel certain, from your own experience, as to the nature of the concrete the Government had been in the habit of putting in, that your tests are reliable? Yes; so far as the tests are concerned, we followed the specification literally.
10897. Did you make any inquiries as to the way the Government have carried out their concrete work? No; not in the sewerage works. We simply followed the specification.
10898. Did you not receive any information upon that point? Mr. M'Credie may have done so, but I am not aware of it.
10899. Have you much knowledge of sewerage construction? No.
10900. Is there any other subject upon which you are in a position to make a report? Yes; we have dealt with the question of grouting.
10901. In what way is the grouting specified? Each layer of concrete is supposed to dry, and it is then washed and grouted.
10902. How many layers did you calculate? Layers of 9 inches.
10903. How many layers did you calculate? It would depend upon the depth of concrete. We took it as a 9-inch. We got a bed 9 inches thick in the yard box and then grouted it.
10904. If the concrete were not carried out in layers, as provided by the specification, and were stepped at every chain, and had then to be re-started, it would consume a lot of cement, would it not? Yes.
10905. *Mr. Davis.*] The stone that you used for your experiments was knapped stone? Yes.
10906. The knapping would produce more cubical stone than a machine, would it not? I dare say it would.
10907. You say you used a six-pronged fork? I cannot swear as to that.
10908. What space would there be between the prongs? I dare say from three quarters of an inch to an inch. It certainly would not be more than an inch.
10909. You say you adhered rigidly to the specification? Yes, to the very letter of it.
10910. Did you find in the specification anything about the stone being forked? A fork is used by the contractors for handling stone.
10911. But did you find anything about a fork in the specification? I do not think the specification mentions forking.
10912. Yet you say you kept rigidly to the specification? We used the fork for convenience sake.
10913. Where it was convenient to depart from the specification you did so? Yes; but we had no ulterior motive.
10914. When you found you could get through your work more quickly, you departed from the specification? It is the custom to use a fork when you are mixing ballast. If you use a shovel you pick up a lot of dirt and filth.
10915. Do you know what the specification says as to the elimination of dust and sand from the stone which is used for concrete—is a fork mentioned? I have not seen it.
10916. What does the specification say? It mentions screening, I think.
10917. Will you say why you did not screen the metal rather than fork it? There was no particular reason. Forking is a convenient method of handling the ballast; that is all.
10918. You have spoken a good deal of your experience of concrete work;—will you tell His Honor what experience you have had in putting concrete in position? I have supervised the erection of several houses, but I have not said much about experience.
10919. In concrete? Only the footings; there has been the usual run of footings.
10920. Beyond that have you had any experience? No.
10921. Would you like to pit your experience, gained from work of that description, against the experience of others who have carried out thousands of yards of concrete? I have no great experience of that kind, but I know that these tests were made.
10922. I am speaking about your experience;—would you like to pit your experience against the experience of those who have carried out thousands of yards of concrete in work similar to that under consideration? Not in the matter of experience.
10923. Would it not be more likely that they would know what concrete would probably make in work under certain conditions than you would know? In the matter of experience I dare say it would be so.
10924. As to the grouting, how did you arrive at the conclusions mentioned in your report? We took a third of a foot of cement and two-thirds of sand and mixed it into a liquid.
10925. That would make how much? A foot.
10926. A cubic foot? Yes.
10927. What quantity of water did you put to those quantities? Enough to make it liquid.
10928. Do you know how much? I think a big bucket.
10929. Another cubic foot of water, do you think? More than that, perhaps.
10930. A foot and a half? I should think so, though I am by no means sure on this point.
10931. Then you would have 2½ feet;—what did you do with that 2½ feet of grouting? We used one of the ordinary zinc buckets; but it would not contain 2½ feet. We mixed the material into a liquid, and then placed it over the concrete, brushing it into any interstices or depressions.
10932. On to what did you put this grouting? On to 4 yards of surface.
10933. Four square yards of surface? Yes; the box was 4 ft. x 4 ft. 6 in. There were two of those boxes, making 4 yards altogether.
10934. And you say you put 2½ cubic feet of grouting on to 4 square yards? Yes.
10935. What was the thickness of the grouting when it was put on to the 4 square yards of concrete? The grouting we put on would not go more than the eighth of an inch. It would be a little thicker in some parts than in others though.
10936. Supposing the concrete work had not been grouted, as you seem to have assumed it was every 9 inches, do you think it would be a fair thing to charge against the contract the quantity of cement which should be used according to your estimate? Of course, if it were not used it would not be there; but the work was specified to be grouted.
10937. How much did you reckon for a cask of cement? We ran it out into a 4-foot box.
10938. And that was the quantity you reckoned? Yes.

10939. From your experience in the use of cement, what would you say that a cask of cement would measure, taking one cask with another? Some of the English cement will run  $4\frac{1}{2}$  feet when loose. Goodlet and Smith's rock cement just filled a 4-foot box.

10940. That cement has not been made very long? A few years, I think. I do not know when the works were started.

10941. Would you be surprised to learn that the works had not been erected more than eighteen months? I do not know the exact period, but I do not think they have been in existence more than a couple of years.

10942. In the second paragraph of your joint report, you refer to the departmental estimates;—to what estimates do you refer? To the estimates on page 339 of the Parliamentary return. We took that more as a comparison between the cost of guttering and gadding and blasting, as estimated by the Department.

10943. Supposing it to be the fact that the estimate you quoted refers to Contract 79A, and not to Contract 79, then what you say right through your report would scarcely be applicable;—you would not suppose that the Government would use the same figures in every contract? No, probably not.

10944. This estimate, as you see, refers to Contract 79A, and not to Contract 79? Yes. We only adopted it to make the comparison to which I have referred.

10945. Then you would say that it would not apply? Not beyond that comparison.

10946. But your comparison would not be a fair one? Yes; in that respect it would. We took the Government estimate for blasting and their estimate for guttering and gadding. We took 17s. as the difference between the two.

10947. *His Honor.*] If both prices were ratably higher the difference would be greater; if they were ratably lower the difference would be smaller? Yes.

10948. *Mr. Carter.*] Do you consider that irregular-sized stone will make the best concrete? Yes; I dare say it would make better concrete—at any rate in the bluestone.

10949. *His Honor.*] Irregular sized stone? Yes; but when we saw that 2 inches was specified, we assumed that the stone was to be as near 2 inches as we could get it.

10950. But as regards the strength of the concrete it would improve it to put in various sizes of stone under the maximum? Yes; I should think so.

WEDNESDAY, 5 AUGUST, 1896.

Joseph Davis recalled and further examined.

10951. *Mr. Parkes.*] Will you read the supplementary specification of Contract 77, which appears upon page 247 of the Parliamentary return? Yes. It is as follows:—

The structure above the level of the skewbacks of main arches to be constructed, as shown on drawing which accompanies the contractor's tender, of cement mortar (except the cement facing) composed of one part of cement to three parts of sand and wrought-iron rods on the "Monier system."

The foundations of piers are to be in conformity with the drawings attached to the contract, except as regards the extra size necessitated by the larger pier shown on the contractor's plan, and are to be to the satisfaction of the Engineer.

Should the piers be required to be put down to a greater depth than shown on the drawings, or a greater number of them require piling than shown, the work is to be executed as ordered without extra payment being made.

The piers are to be built with sandstone concrete of the quality specified, and faced with cement mortar composed of one part of cement and two parts of sand.

The cement facing of the structure, above the level of the springing of main arches, is to be composed of one part of cement and one part of sand.

The works generally are to be carried out in accordance with the specification, schedule to specification, and the plans therein referred to, save and except such structural parts as are to be carried out under the "Monier system," or necessarily enlarged to meet the requirements of the contractor's plan, and within the time set out in the general conditions.

10952. How is it that your vouchers show payments for two to one mortar? None of that work was done, I think, so it is not paid for.

10953. There is no specification for the five, three, and two, special bluestone concrete? No; not attached to the contract.

10954. It was optional to substitute it for the compo.? When the portion of the carrier nearest the Glebe was about to be commenced the contractors put in two lengths of the carrier, one composed of three to one compo. and the other of five of bluestone, three of sand, and two of cement. Two lengths of the same carrier were put in in that way. They were tested by Mr. Darley, and he came to the conclusion that the bluestone was the better construction, the more stable structure, and he decided, as the contractors were willing to substitute the bluestone concrete, to allow that to be done.

10955. They substituted it at the price of the compo.? They did so, although it cost more.

10956. Still, that is their agreement with you? Yes; it is all covered by the lump sum of £15,500.

10957. Therefore in the valuation it ought to be taken as compo.? It is a lump sum tender. Professor Warren in his estimate took into consideration the fact that the contractors were using this composition of five, three, and two, in the carrier.

10958. Will you continue reading the specification? Yes.

The contractors shall continue to maintain the said works at their own cost after the period of maintenance set forth in the general conditions, for a further period of three years computed from such date, to the satisfaction of the Engineer, whose decision shall be final and conclusive upon all points concerning workmanship and materials, and the permanency and durability of the said works: and the contractor shall enter into a bond to Her Majesty the Queen in the penal sum of £12,000, and find two sufficient sureties to enter into separate bonds in the penal sum of £6,000 each, to secure the removal of so much of the said works as shall have been constructed on the "Monier system," if the Engineer shall be dissatisfied with the same at any time during the said periods of maintenance, and to re-erect and construct the said works at their own cost and expense in accordance in all things with the specification, schedule to specification, and plans therein referred to, within thirty-nine weeks from the date of being called upon so to do.

10959. Those sureties were supposed under that undertaking to be men independent of the contractors? They were supposed to be men who were independent of the contract.

10960. But independent of the contractors? I would not say that they were, because, as a matter of fact, it is generally known in the office that these men have for years been mixed up together in one way or another. Some part of the firm would be tendering at one time and some part at another time.

10961. But would you take as sureties men who were interested in the firm? Mr. Gillan and Mr. Forrest were taken in this instance, but I would not say that they were interested in this contract. It was not known that they were interested in this contract.

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10962. Does not the specification you have read state that the sureties should be independent of the contractors—that they should not be allied with the contractors? It says that two sufficient sureties are to enter into separate bonds in the penal sum of £6,000. It all depends upon what is the meaning of the word “sufficient.” The Department judged that Mr. Gillan and Mr. Forrest were “sufficient” sureties.
10963. Has it not been the general practice of the Government in taking sureties to insist upon their being persons with fixed securities? The Department has taken every care to ascertain that the personal sureties they have taken have been men reputed to be worth powder and shot. [*Vide Appendix No. 9.*]
10964. Is it not the general practice to take men of fixed property? I would not say that. I would say that they should be men at any rate worth as much as, or more than, the amount of the bond they enter into.
10965. Would you not read the undertaking to mean, so far as Mr. Carter is concerned, that if the Government would take the patent they would give a disinterested guarantee to remove the work in three years if it were not suitable;—that the contractors undertook to enter into a penal bond of £12,000 and to provide two sufficient bondsmen of £6,000 each to replace the structure if any defects were discovered, or if it were found not to be stable? Really the Government have a guarantee of £24,000—£12,000 as far as Carter, Gummow, and Snodgrass are concerned, and if they failed there would be £12,000 in respect of Mr. Gillan and Mr. Forrest.
10966. Really the Department would only have £12,000 guaranteed if Carter & Co. failed? I did not put it in that way. I said they had a guarantee of £12,000 as far as Messrs. Carter, Gummow, and Snodgrass, were concerned, and another £12,000 in respect of Mr. Gillan and Mr. Forrest.
10967. You mean that they had a promise of that amount—they had no cash bond? No cash security.
10968. But when you take bondsmen’s names you want to know whether they have some cash on which you can lay your hands, or the equivalent of cash in property? As far as Messrs. Carter, Gummow, and Snodgrass, were concerned, we had a fixed deposit; as far as Messrs. Forrest and Gillan were concerned, we had a statutory declaration that they were worth the amount named.
10969. The concrete which was specified to be used in the original structure round the carrier would be seven, three, and two? Yes.
10970. In making up a schedule, the contractors generally take off a certain percentage from each item in the schedule, and see what they can make out in a lump sum? I cannot say what they do. One contractor would do one thing and another contractor another.
10971. But all the items of the schedule compiled by the Department would not bear a uniform relation? They should do so. At the same time, the officers of the Department are not perfect, and the prices given might not bear the same relation to each other. At any rate, there might be room for difference of opinion. The contractors might consider that they were not in proportion.
10972. What is the price of Bautel’s and Bakewell’s best double-pressed bricks? It depends upon the place to which they have to be delivered; but, taking one contract with another, I suppose they would be worth from 60s. to 70s. a thousand. They used to be worth 90s. or even more than that a thousand.
10973. Are they not worth about 80s. a thousand? They used to be, but I do not think that is the price now. The last time I inquired they were 70s., but whether they have gone up lately or not I do not know.
10974. How long ago would it be since you inquired? Some months. I believe that the man who was instrumental in bringing down the price has given up making bricks, and possibly the other makers may have taken advantage of that.
10975. The average price would be, say, 70s.? I should say something like that; but it would depend upon the distance at which the bricks had to be delivered. I may mention that in the case of the Marrickville contract the brickyard was on the ground. There was really no delivery.
10976. Coming now to the matter of stone—what is the price of the best dressed stone per foot? The rough Pymont bottom-block stone would be worth about 27s. a cubic yard delivered. Then there is the dressing, and it stands to reason that the price for dressing would depend upon the amount of work upon the stone.
10977. But what is approximately the market price per cubic foot? I should say it would be about 3s. if there were an ordinary amount of dressing on the stone. It is generally dressed at the works.
10978. But what is the price of the stone at the quarry? The best bottom-block would be about 1s. a foot.
10979. The very best? Yes.
10980. Are you not making a mistake there? I do not think so.
10981. Suppose you were going to erect a large building, could you get the best bottom block stone at 1s. a foot? I should say that that would be a fair price.
10982. Do you know the price? I do.
10983. Whose figures are you quoting? I am quoting from my own experience—from my own knowledge of Sydney sandstone.
10984. Are you referring to the best Pymont stone? The stone I speak of would be equal to the Pymont stone. It is obtained at Waverley.
10985. But what about the Pymont stone? It is possible that Mr. Saunders has a higher estimate in connection with his own quarry. He might possibly try to get a little more for the stone.
10986. You put the labour and stonework, associated, at 3s. 6d. a foot run;—is that a fair price? I should say that it was a little high. The Department, in the general conditions, provide that the ashlar work is to be measured from outside edge to outside edge, that is, the stone that is cut away is paid for. The contractor in fixing the rate would take that into consideration, I should imagine. If this stone were paid for nett measurement after it had been chiselled it would be put at a higher price.
10987. But the contractors pay for it at the quarry in bulk? Yes.
10988. *Mr. Norrie.*] At the time the supplementary specification was drawn, do you know whether it was anticipated that Mr. Gillan and Mr. Forrest would be the sureties named by Carter, Gummow, & Co.? No.
10989. Was it known that they might name these two gentlemen? No; the specification was drawn quite independently of them. As far as my recollection serves me, and I think the papers show it, the question of personal sureties came up afterwards. When the supplementary specification had been drawn, Messrs. Carter, Gummow, & Co. wrote.
10990. *Mr. Parkes.*] But the supplementary specification was drawn by the contractors? No; by myself in conjunction with Mr. Norrie. [*Vide Appendix No. 1.*]
10991. But it was sent in by the contractors? No; it was drawn by myself in conjunction with Mr. Norrie, altogether independently of the contractors. I drafted the specification with my own hand.



10992. And the other specification was incorporated in it? It was incorporated in the bond.
10993. But with the original specification? The draft specification is given on page 207. Messrs. Carter, Gummow, & Co., wrote upon 4th April, after it had been drawn, objecting to stringent clauses. What they submitted was their tender with the plan which is before the Commission and that only. When their lump sum tender was accepted the question of the supplementary specification arose and I drafted it myself in conjunction with Mr. Norrie.
10994. But the letter of Carter, Gummow, & Co. is not a protest against the specification. It is only a suggestion that the Department should dispense with the bondsmen? It is a protest against that part of the supplementary specification dealing with the question of bondsmen. [*Vide Appendix No. 9.*]
10995. It is hardly a protest. It is asking you to do what you did ultimately? No; and I can only repeat what I have already said. We knew absolutely nothing to guide us in coming to the conclusion that Mr. Gillan and Mr. Forrest were members of the firm for this contract. On the contrary if we turned to the tender we found that the gentlemen composing the firm were Mr. Carter, Mr. Gummow, and Mr. Snodgrass, so far as that particular job was concerned.
10996. Had Mr. Gillan and Mr. Forrest ever done work for you themselves outside of Mr. Gummow or Mr. Carter? Certainly; both of them—both Mr. Gillan and Mr. Forrest. [*Vide Appendix No. 25.*]
10997. On what occasions? Mr. Forrest in conjunction with Mr. Snodgrass; Mr. Gillan in conjunction with Mr. Snodgrass; and Mr. Gillan in conjunction with Mr. Gummow.
10998. But they had been associated with Mr. Gummow? They were mixed up for years in some way, which I do not profess to understand.
10999. Knowing that, would it not have been well to inquire whether Mr. Gillan and Mr. Forrest were members of the firm? It was no part of my province. I do not see how I could answer the question.
11000. *Mr. Norrie.*] You would not think the Department would be justified in refusing to accept as a surety a person known to be worth a large sum of money in bank or other stock because he had not real estate? I should say not. In the case before us, every means seems to have been taken to satisfy the officer responsible that these men were stable men, and were worth the amount of the personal surety into which they entered with the Government.
11001. Would you like to enter into a bond of that kind without having a *quid pro quo*? I should say not.
11002. *Mr. Carter.*] The guarantee of £12,000 of Messrs. Carter, Gummow, & Co. would be sufficient to cover the whole cost of the superstructure, independently of the sureties, if it had had to be removed? More than sufficient. The superstructure, according to the estimate of Professor Warren, would cost about £7,500. We had a personal guarantee for £12,000 in addition to the fixed deposit of £775.

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William Henry Warren recalled and further examined:—

11003. *His Honor.*] I notice that the price of timber is given in your estimate as follows:—732 cubic feet at 2s. 6d. per cubic foot, and 7,513 superficial feet at 13s. per hundred. I have been unable to reconcile these two prices? I have taken 13s. per hundred superficial feet because I thought it a fair thing, and so far as the cubic feet are concerned, I think 2s. 6d. is a fair price for good timber.
11004. But how is it that the cubic foot measurement comes out at nearly double the superficial measurement, not only in your estimate but in the specification;—why should timber, measured in one way, be so different in price from timber, in which there is more work, measured in another way? I think that you will find that Goodlet and Smith's price-list shows the same thing. I have often had to order timber from them. It is possible that I may have paid a little more than would be paid by the contractors, but I think I have given the prices in Goodlet and Smith's list.
11005. But can you explain how it is that the prices run so differently? Well, you could use the superficial feet over again. It does not look to me like new timber, although I dare say it was new when it was first put in. I cannot explain why there should be the difference you mention. I do not know that I ever thought of it before. I have simply taken the facts.
11006. *Mr. Parkes.*] You know that the trade never sell small scantling, such as 6 x 4½, 12 x 4½ or 8 x 4½, by the cubic foot? Perhaps not, but I have always been accustomed to estimate cubic feet of timber. All bridge work is done in that way. I remember the prices better, taken by the cubic foot.
11007. But if you take the cube out, ought you not to base the price on the superficial value;—why do you add on 100 per cent.? It is possible that I may have taken the timber too low at 13s. per hundred.
11008. But ought not the value given to be the price at which the trade sell the timber? If I have given any price which is not in accordance with market rates it is wrong, of course.
11009. Did you measure up the scantling yourself? I did not measure it all. I measured one span, and I assumed that the others would be the same.
11010. Did you not notice that in the main principle you got one piece of timber, 12 x 6, made up of fitches bolted together? But it comes out at the same cubic measurement.
11011. But you have taken it at 2s. 6d. per cubic foot;—why did you not take it at the superficial measurement, seeing that it was bought at that measurement? It is my way of taking such measurements. Bridge braces are measured in the same way. I measured the timber in just the same way that I should measure bridge trusses. I saw that there were two or three pieces together, but I took them in one item.
11012. Where did you get the price of 2s. 6d. per foot? I knew that the timber would be worth about that.
11013. But it is not worth that;—the price is more than 100 per cent. in excess? Of course if Goodlet and Smith's list shows a reduced price, I must accept it.
11014. I am taking trade prices—the prices of all the merchants;—as a matter of fact, I believe Mr. Carter bought his timber from Guy, and Guy's price is 9s. 6d., not 13s. per 100 superficial feet? I was not aware of that. [*Vide Appendix No. 41.*]
11015. There are various kinds of timber used, 12 x 4½, 6 x 4½, 4 x 4½, but you have put it all down at 12 x 6? It works out at the same cubical contents. I measured one span, and I took them all to be alike.
11016. If they are irregular, your calculations would be thrown out? I felt that it was extra work for me to measure the trestles at all, and I thought that if I took a measurement in order to get at the price of one trestle, it would be sufficient.
11017. *His Honor.*] Which one, as a matter of fact, did you measure? I measured the second from this end, the one over the stream.

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11018. *Mr. Parkes.*] Did you work out the average of what you call the lagging on the top of these principles? Yes.
11019. How did you arrive at the 9 feet of width? It is 9 feet.
11020. But it is irregular—the timber runs all sorts of length? That which I measured was 9 feet.
11021. But the timber is irregular—there are ends sticking out? A little; but it is about 9 feet.
11022. How did you get the average? I simply looked along the work. I measured the projections; that is how I got it.
11023. Supposing the average accurately taken were found to be 8 feet, that would alter your calculations? It would alter it to the extent of one-ninth on that item.
11024. Here is a mistake you have made against yourself; the side boxing is 83 feet; you will find there is an average of 2 feet by  $1\frac{1}{2}$  inch; that will make your calculation a little greater;—but, as regards the fitches, of course they should be measured by the superficial area, instead of the cube? I would not press anything like that, of course. I did not take out the quantities as if I were going to build; I simply wished to arrive at a price. I did not measure up the timber in the way in which I should have done if I had been ordering timber. I simply wanted to get an idea of the quantity of timber and the price.
11025. The six ribs you have given in your estimate should be twelve, should they not? Yes.
11026. And the next item should be six ribs of lagging to each small arch? Yes.
11027. You have 500 superficial feet in that item? Yes.
11028. But there would be really 750 superficial feet, so that there would be a little extra? I am prepared to accept any correction, so far as those details are concerned.
11029. The boxing of the small piers, if you measure it according to dimensions and take it superficially, would be 495 feet instead of 750 feet;—I suppose you will accept that correction? I took the measurement from the size of the piers which are already there. I had not seen the boxing. I had to take what I thought to be a sufficient quantity of timber for the construction.
11030. Did you take the measurement off the plan as well as off the actual timber? I did the best I could between the two.
11031. As to the item of timbering the sides of the main carrier, did you take a very accurate measurement of that? It is on a par with all the timber measurement.
11032. I think you will find there is a little error there, and that it is 170 feet too much? When I measured the timber there was no work going on there at all, and I had to fill in the quantity which I thought would be necessary to carry out the work.
11033. *His Honor.*] You got on to the top of the arch, I suppose? Yes.
11034. *Mr. Parkes.*] How did you arrive at the 30 superficial feet per foot run in what might be called the invert mould—in what you call the lagging;—could you tell me whether, as a matter of fact, it is not 15 feet? I have not the details with me now, but I will accept it at 15 feet if you say that that is so. I have taken it as 2 inches thick.
11035. As a matter of fact, it is only  $1\frac{1}{2}$  inch thick;—did you know that? No; I took it at 2 inches.
11036. Did you measure it with a rule? No; the timber was not there, but I knew, of course, that it was necessary.
11037. If it is  $1\frac{1}{2}$  inch thick, instead of 2 inches thick, that would make a considerable difference in your measurement? It would be a quarter off.
11038. As to the scaffolding, you have taken all the scaffolding;—how did you get at that—did you measure it all? I think I may have underdone the scaffolding; it was not all there at the time when I took the measurements. I saw afterwards certain planks which I had omitted.
11039. Only 75 per cent. of the scaffolding goes to the principal part;—now as to the scaffolding for the piers? I took the scaffolding I saw, and I added what I thought necessary. I assumed that it had nothing to do with the piers. The scaffolding necessary to put the concrete in the piers was estimated at £1 8s. That is one reason why I did not knock off anything from the £1 8s. when I took my own prices.
11040. Are you sure that 260 cubic feet of scaffolding would go to the Monier part of the work? Yes; I measured it and worked it out. Of course, I did not measure the timber as though I was going to order it.
11041. You enlarged the quantity, did you not? I do not think so.
11042. What is the size of the scaffolding? There are two uprights with the horizontals and bracings.
11043. What were the dimensions of the timber? I do not remember.
11044. Have you any record of the dimensions? Not with me.
11045. Do you think 8 x 8 and 8 x 4 would be about the dimensions? I think I have 12 one way in my dimensions, but I am not sure.
11046. If the timber were 8 x 8 and 8 x 4, there would be an error in your calculation? I have not my details with me now, and I cannot be certain whether I took the timber at 8 x 8 or not.
11047. If it were so, there would be an error in your calculation? I cannot tell; I have not worked it out. Scaffolding is a small item, and I did not bother very much about it.
11048. Supposing you took the trade prices of the day and ran the quantity out, not as you have done, by the cube, but by the superficial foot, and supposing all your figures were correct, your cubic measurement and superficial measurement put together would make 163 squares? Possibly.
11049. Will you accept that measurement; I have worked it out very carefully? I have no doubt it is right.
11050. Where did you get your price of 13s. per hundred superficial feet? I assumed that the price would be about 13s.
11051. You did not take it from a trade list? No. I have often ordered timber, but I order it generally by the cubic foot.
11052. Have you not charged too much for the small scantlings? I have ordered 8 x 8, 12 x 12, and 10 x 10 hardwood and Oregon timber. The price I have allowed is founded upon the price I generally pay.
11053. It must have been a very small portion of timber? I should not order large quantities for my ordinary testing.
11054. Take the price at your own—13s.—the cost of the timber in four sets of arches would be considerably reduced? I should be surprised to find that it was. Of course, I may have overmeasured it.
11055. I mean taking the timber by the superficial foot, instead of the cube foot? Of course, because the price per cube foot is dearer than the price per superficial measurement.

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11056. *Mr. Davis.*] In your estimate of 2s. 6d. what have you included—where have you got the iron-work used in the construction of the centres? I have taken it all in in the price I have given. I took a sketch of the bolts, and I took the pitch of them, and they, of course, are included.

11057. In fixing the price at 2s. 6d., did you not take that into consideration? I did.

11058. Is it not invariably the case in measuring centerings, or rough bridge work, to take the cubic contents of the work as it stands, including the ironwork? Undoubtedly. As I said before, I measured the work as I should measure bridge work, where we do not go in for superficial measurement as would be done in the case of architecture.

11059. *Mr. Parkes.*] Coming to the labour in the girders, you have multiplied each into your sum total as if a new set of timber were required for every arch? I took the cost of labour for the completion of one arch.

11060. But you have forgotten that the same set of material would be shifted from arch to arch? It can be removed from one arch to another, certainly.

11061. That would be merely the labour of removal, but you have estimated the labour of fixing the centering, and putting it together in connection with each arch;—that, surely, is an error? I have taken it in this calculation as if the centering had to be erected for each span.

11062. As if it were pulled down and had to be erected again? Yes.

11063. So that if that did not happen there would be an error in your calculation? Yes, to that extent.

11064. *His Honor.*] Did you take each item distinctly—that is, the complete making of a centre, the laying of it out, the measuring, and everything? No; I merely allowed for the building of it together. The labour for making and fixing the centres is distributed over the arches, but after the centres are once made I can see that they could be removed without so much being taken down as I have assumed to be necessary.

11065. *Mr. Parkes.*] The same thing would apply to the boxing, the invert boxing, and also the centres for the small arches; once they have been made they can be shifted from one position to another? There is really nothing in the centering for the small arches; that would not make any difference; my price would come out right for that.

11066. They did not put in new centres for every one of the little arches, did they? I do not think I have taken the centres per arch.

11067. You have multiplied them, and have put them into your addition;—the labour you put in is for the entire work is it not? Yes.

11068. Very well, then, you have multiplied that into the arches; that is evidently an error? I do not quite see that it is so.

11069. You have given the total of labour for each arch, and you have made a sum total for the arches? Yes.

11070. You have taken the seventeen arches, and have multiplied them by your entire labour, therefore you have included in it all the labour that was used in making the centerings, as well as the labour used in removing them; you have put down £7 for the removal of the timber, and you have even included that? Yes.

11071. As a matter of fact, all the labour in the centerings, with the exception of four, should have been eliminated; the only other items left in would be the removal and re-erection of the centerings? There would be a good deal in connection with re-erection.

11072. You have put down an amount for removal and re-erection, and it would have been all right to multiply that by seventeen, but as regards the labour used in the construction of the centerings, you should have multiplied by only four; you see that an accidental error has crept in there? Yes, apparently.

11073. You have allowed an item of £150 for cost of plant, consisting of two sheds, one office, tools, barrows, &c.; do not the sheds and also the tools and barrows remain the property of the contractors? I should like to say a word or two about that matter. I am not an expert in the valuation of property. His Honor would probably value it better than I could do. The thing stands as I have it in my estimate, and, of course, it is of no use to press it if you object to the valuation. The sheds and office on the ground can be valued by someone who is accustomed to value those things. If I were buying them, I should certainly get some one to value them for me.

11074. When the contract is finished the contractors remove the sheds, the barrows, and the tools? I had better make this explanation. I assumed that the contractors would not estimate, in making up their contract, what they would be able to do with these things afterwards. They might not have an opportunity to bring them in again. This might be their last contract.

11075. There is also an item of £25 for 2,000 feet of water-pipe at 3d.; when the contract is completed that still remains the property of the contractors? Yes; but it will have to be taken to pieces and carted about, and the probability is that it would not be of very much use.

11076. But the contractors would dispose of this material if they did not shift it; ought there not to be some contra allowed for the price they would receive for it? I thought I put the price sufficiently low to allow for that.

11077. Then take the matter of supervision—you have allowed 5 per cent., or £375? Yes; the 5 per cent. was just a guide.

11078. You are putting it in the total of £1,176 12s. apparently, but you had previously included it in the price of the compo.? That makes a very slight difference; this is only a rough estimate, of course. I had hardly any other way open to me of making the estimate unless I spent a good deal of time upon it. It is only approximate.

11079. Have you not by these various means built up in rather an extravagant way the cost of this Monier construction? My estimate may vary from your estimate. It may appear high, but, of course, I cannot help that. I have not intentionally made it high.

11080. Although your supervision is put down at 5 per cent., it really goes into the contractors' profit? If you subtract it from the other items there you will find that it comes out at about 5 per cent.

11081. But supervision is put down in the price of labour at 10s.? That is a foreman's wages. You cannot call that supervision. It is not the supervision such as the contractors would have to pay for. The supervision I refer to would be that of the contractors' engineer, or that of the contractor himself. I suppose he would expect to be paid some salary.

11082. But you have also given them profit and risk? That is not included in his actual professional labour.

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11083. Where did you get your item of wages, 7s. 6d., and in one case 10s.? I know that I always had to pay 7s. 6d. for a man. This is not such easy straightforward work that you could expect to get it done much cheaper.
11084. Suppose the contractors' pay-sheets show that they have been paying 7s. and 6s., and that they have had a foreman at 8s., that would reduce your calculation? Of course the pay-sheets would be a better guide to the cost of labour than would my estimate. I had not the advantage of the pay-sheets when I was making my calculation.
11085. That would lower your estimate? It would lower it to that extent, but it would be far better for the contractors themselves to answer questions of this character.
11086. In your item for timber you first of all take the building of seventeen spans at a certain price, and you distribute it over the entire quantity per yard of material. Coming to the forty-two small arches, are those forty-two arches outside that? Yes.
11087. You have put down £3 10s. for the putting in of that timber—is not that excessive? It is these arches that have brought down my second price as compared with my original price. Putting it all in like that reduces the cost per cubic yard.
11088. But do you say that it costs £3 10s. to set out three pieces of timber for one of these little arches? That is the total cost for the arch.
11089. Contractors do not waste money as a rule. The contractors would make a few centerings for these small arches, and those centerings would be re-used. That item therefore disappears? They would have to leave some of the centerings in for a considerable time.
11090. But only about twelve of them? They cannot strike the centres at once.
11091. But you have allowed an amount as if they built a new centre for every arch from end to end of the structure, leaving the centerings in or throwing them aside? I do not think they have done that, but, on the other hand, they could not build an arch and then knock out the centering at once and proceed to build another arch. They would have to leave in some of the centerings.
11092. But you do not say that they make a new centering for every arch? Possibly not, but at the same time you must allow for the centerings being in a fairly long time.
11093. Suppose as a matter of fact the contractors have been using twelve sets of centerings for these small arches? I should expect to see more used.
11094. Did you see more on the works? No; I had to arrive at the quantity myself.
11095. You saw some there? Yes; some were in use.
11096. Did you see any on the ground? No; I did not look for any.
11097. Supposing they were using 12 centerings, that would materially alter your calculations? Yes.
11098. As to your 574 lineal feet of carrier beyond the main arches at 5s. a foot, how do you arrive at that value—is it guesswork? Not exactly guesswork.
11099. But you have taken it roughly? Yes; it was not an important item.
11100. Suppose it turned out that in guessing at this amount you had gone considerably higher than the facts justify, that would make another difference in your calculation? I think you will find that my estimate is not far wrong.
11101. Suppose the contractors are using about 80 feet of this timber-work, and that when that much had been used it could be re-used? Some of it I have no doubt would be used again. I have taken it at 5s. a foot.
11102. But it ought not to be re-charged again and again, ought it? It ought not to be charged again if it is re-used.
11103. As a matter of fact the only charge which could be made in connection with it would be for fixing it? You have to consider the timber.
11104. I am dealing now with the labour. The labour would be not for putting the thing together again, but for shifting it from one place to another? When you have the thing fixed for a certain length of course you could shift it from that length to another, and that might cost from 4s. to 5s. a foot, perhaps more.
11105. Per lineal foot? Yes.
11106. As to the amount of £11 10s., the cost of the grills in the arches and carriers, where do you get that from? I am accustomed to estimates for ironwork.
11107. That is your own estimate? Yes.
11108. If you were told that the ironfounders of the city had made the material at £8 10s., what would you say? I should say that they were making it much cheaper than the price to which I have been accustomed.
11109. Iron is especially cheap just now? That may be so, but the price you name would be very cheap indeed. I think £11 10s. per ton is a very fair price.
11110. You did not proceed upon the basis of what the merchants would supply the iron for? No. I had to base prices upon the cost of the work at the time the contract was let, and I know that £11 10s. was the price at that time. That would be before I went to England.
11111. Did you make any inquiries of the ironfounders to ascertain what they would supply the iron for? I am always making estimates for ironwork, and I do not require to ask anyone.
11112. You did not ask anyone what it would cost? No. Even if I thought the price were different now, that would not alter the estimate I have given.
11113. Where did you get your price of 7s. 6d. per cubic yard for sand? I think that is about the price that is charged. That is the price you will pay for good sand.
11114. For Nepean sand? Yes.
11115. Do you know what the price of sand is as it comes out of the crusher? No; I should have to ask about that.
11116. If you discovered that it will cost 4s. a cubic yard, that would materially alter your calculation? Obviously.
11117. How did you come to fix the cost of a cask of cement at 11s. 6d.? I think I was paying more than 11s. 6d. at the time this contract was let. I think you will find that that is a fair price.
11118. You paid 11s. 6d., I suppose, buying the cement by the single cask? They always let me have it pretty cheaply for the tests which I have to make; I never pay too much for it.
11119. Suppose cement were actually sold at 9s. 6d., and that it cost 10s. a cask delivered on the ground? Then I should say they got it cheaply.

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11120. But that would materially alter your total? Yes.
11121. How many cubic yards are there in each of these compo. arches? 23·6 yards.
11122. Then you will be altogether out in your cubic contents when you put them down at 383 cubic yards? I am not responsible for that. These are the figures which were given to me. Mr. Davis, Mr. Thompson, Mr. M'Creddie, and I met and agreed to take these quantities.
11123. If it works out at 424 cubic yards of compo., that will reduce the cubic yards of concrete? Yes.
11124. And it will make some difference in your calculation when it is worked out? Yes; it would increase the item for compo.
11125. And decrease the item for special concrete? Yes.
11126. Coming to the Departmental estimate for Contract 77—that is, the schedule prices—you could not afford to take 28½ per cent. off the £2 10s. for brickwork? I do not think so; I think that is proved by my own estimate.
11127. But you could not take the 28½ per cent. off the price in the Departmental schedule? I had to do it; I was instructed to do it.
11128. If you took it off, that would make the cost of the brickwork £34 6s.;—could it be carried out for that? I think it would be too low, and I think I proved that by taking the full price, £2 10s., in my own estimate.
11129. The material alone would exceed £34 6s.? Yes, if good bricks were used.
11130. So that you cannot take off the 28½ per cent. if you are to give the full value? No.
11131. Then as to the the 12,190 cubic feet of freestone ashlar at 3s. 6d.? I have taken that at 3s.
11132. If you took 28½ per cent. off that amount it would make it 2s. 7d. per foot; the work could not be carried out for that, could it—that is the material and labour would exceed that cost by a long way? It is a cheap price of course.
11133. Therefore is it not a fact that if you separate the material in the aqueduct from the rest of Contract No. 77, you find that the prices have been placed so low that the 28½ per cent. would really come off the tunnel work? I had nothing to do with the tunnel work. I had the quantities and prices given me and I took them as correct.
11134. You could not very well arrive at a price by taking 28½ per cent. off every item uniformly? I have not done so. My own estimate proves that.
11135. But taking the Departmental estimate there can be no doubt that the prices would be far too low if 28½ per cent. were taken off? In some of the items the price would be too low I think.
11136. Having regard to all the matters which require alteration in your report, do you not think it would be better for you to rearrange it upon the evidence you have given and then resubmit it to His Honor in its rearranged form—is it not apparent to you that with the alterations you will have to make you will reduce the total of £6,098 15s. 8d. by many hundreds of pounds—in fact nearly £1,000? If I were to make a fresh estimate based upon my evidence, it would be equally open to question. It would be much better for you to get some one else to make an estimate and allow mine to stand.
11137. Would it not be well for you to make the corrections you have admitted to be necessary? I should be glad to do that of course, if you wished it.
11138. *His Honor.*] What you think is this, that a man like Mr. M'Creddie, who is constantly engaged in this actual work of measuring and valuing, and dealing with works actually in existence, is more likely to be correct than you are? On current prices, certainly.
11139. Do you think you could make your estimate so accurate as to be really reliable without going into the market and finding out all sorts of things? I could revise it to some extent, as I said before, but it is quite possible that, on consideration, I might not get it down low enough for Mr. Parkes.
11140. I cannot exactly understand what the 140 expansion joints which are given consist of? That was the number given to me. They are put in to provide for the rise and fall of the arches.
11141. But how does the number 140 come in, seeing that there are only seventeen arches? I have simply given the number which was given to me.
11142. *Mr. Davis.*] As to the measurement of the timber—did you intend your measurement to be anything more than an approximation? No; I should never think of measuring timber work in a case of this kind as if I were going to order the timber for the work.
11143. You regard it simply as an approximate measurement, to give you an idea in a general way of the quantity of timbering in the centering, the lagging, and the scaffolding? Certainly.
11144. Will you look at the item of 732 cubic feet at 2s. 6d. per cubic foot;—did you in that 2s. 6d. include the ironwork and bolts? Yes.
11145. Where did you include the labour for actually making the centering in the first instance;—did you include it in the 2s. 6d., or, taking the 7,517 cubic feet at 13s. per hundred, did you include any labour in that? No. I have taken the 2s. 6d. to include the price of the timber and of all the material which you would use in making the centering. It would include the cutting into lengths. The timber has to be cut into lengths. It would not come out to quite the right length when delivered, and it would have to be fitted.
11146. If the 2s. 6d. a cubic foot in the one case, and the 13s. per hundred in the other case, is a little higher than the price at which you could purchase timber, then, seeing that you have included in those prices the labour of cutting up the timber and the ironwork used in connection with it, the price would not be surprising? I fancy the price might be a little above what you would find in a trade list, and for the reasons you have named.
11147. With regard to the cubic measurement for the centering, is it not the usual practice to measure it up by the cubic foot, even supposing the timber itself might be purchased by superficial measurement? Yes.
11148. *His Honor.*] Did it strike you when you were taking some of the timber out by cubic measurement and some out by superficial measurement to make a comparison between the 2s. 6d. per cubic foot and the 13s. a square? No, I looked at the matter in a different way. The superficial measurement has little labour attached to it; there is nothing in it—practically no labour at all as compared with setting the struts and boring the holes for the bolts in connection with the other timber. I measured it just as I should measure a timber bridge. Of course, it would be much cheaper than in the case of an ordinary bridge, and looking at the matter from that point of view, I purposely took a lower price.
11149. *Mr. Davis.*] Let me refer you to the item of erecting the scaffolding, the headings, and the timber work;—you have given the labour for one span of about 82 feet from centre to centre at £33 10s.? Yes.

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Warren.  
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11150. And then in another place you have multiplied that by 17? Yes.
11151. What did you intend that to be—is it the making of the four centres, or is it the work in connection with erecting and removing the centering? It is making and fixing the spandrel piers and arch centering and boxing, making and fixing centres to main arch, lagging, and side-boxing, removing the timbering, and erecting and removing scaffolding. I have not included the joiner's work in that.
11152. You mean that it is erecting? It is erecting in the true sense of the word, taking the pieces of the arch and building them together.
11153. It has nothing to do with the making of the centering? No.
11154. It has to do with the erecting? Yes; we will assume that the centering is ready to be fitted, then you have to bolt it and fit it together—it is the labour for that.
11155. Going back to the item of 2s. 6d. per cubic foot and 13s. a hundred, that would include all the joiner's work, as well as the ironwork, in connection with the preparation of the centering and boxing? Yes, but not the building together. I did not think of that when the matter was mentioned to me just now, but that is undoubtedly the case.
11156. Look at the items under "Cost of Labour on the Monier System;" first of all, you have the building of 17 spans of 82 ft. 6 in. at £60 12s. 6d., amounting to £1,032 12s. 6d.; then there are forty-two small arches at £3 10s. each; that is for labour in connection with the arches;—does it include anything else? They have to be fitted, of course.
11157. Where have you put the price for the iron; I do not see it; I do not see where you have put in any amount, not only for fixing the centering, but for the labour of putting the compo. into position in the arch and in the piers;—is that included in the forty-two small arches? Certainly; that would include the whole thing.
11158. Do you consider, then, that £147 for these forty-two small arches, including the piers, is too much? I do not think so. Mr. Parkes put a number of suppositious questions to me. For instance, he asks whether, if so and so were so and so, such and such a thing would follow, and I have answered him accordingly. At the same time, I must not be taken as saying that these prices are too high.
11159. As to the 574 lineal feet of carrier beyond the main arches at 5s. per foot, you seemed to infer, in reply to Mr. Parkes, that the only labour in that 5s. a foot was the fixing of the centerings;—is that so—where have you got the putting of the compo. in position? I intend that item to include everything, of course.
11160. Does the sum of £147 for the forty-two small arches at £3 10s. cover some of the labour in that connection, and would the same thing apply to the seventeen spans at £60 12s. 6d. each? Yes. Exactly the same thing would apply. It is under the same heading.
11161. And would the item of 574 lineal feet of carrier beyond the main arches, £143 10s., cover the same ground as far as labour is concerned? Yes.
11162. Coming to the cost of the grill in the carrier, you have put down £11 10s. per ton? Yes; I think that is a fair price.
11163. You would not be surprised to find, supposing it were so, that the Public Works Department has contracts at the present time for the supply of  $\frac{1}{4}$  in. iron at £12 per ton, and  $\frac{3}{8}$  in. iron at £11 per ton? No.
11164. That would confirm you in your estimate, would it not? It would confirm my estimate undoubtedly. As a matter of fact, the round iron costs more per ton than does the ordinary common size.
11165. The price paid for the smaller sizes of round merchant iron is higher than the price paid for the larger sizes? Yes.
11166. *His Honor.*] Is the price higher than would be paid for good fencing wire? Yes; the two things are quite different. You cannot take them in the same way.
11167. No. 6 fencing wire, for instance, would be a smaller diameter still? Yes; but this iron is not drawn like wire.
11168. Which is the more expensive, wire or bar iron? Fencing wire, I know, is very cheap just now, but I cannot give you the exact price for it.
11169. You think that it is less ratably, taken by weight? Yes; I should think it would probably be less.
11170. If No. 6 wire were not in much demand, and were only £9 per ton, you would not be surprised to find that you would have to pay £11 or £12 a ton for iron bars? Of course, I never considered the matter in that way; but I know the market prices for iron, and I estimated the price in this case at £11 10s. I thought that a fair thing, and I still think so.
11171. I suppose the price varies according to the demand a great deal? Yes; iron fluctuates a good deal in price.
11172. I mean the demand for a particular make;—a large demand may bring the price down by increasing the supply? Yes, the price is governed by many things which one cannot always foresee.
11173. *Mr. Davis.*] You know that the annual contracts for the supply of the Public Works Department are open to public competition? Yes, I know that.
11174. It is the usual way to introduce competition to get a reasonable, if not a low, price? Quite so.
11175. Take the second item under your heading of timber work—making and fixing centres to main arch, twelve men at 7s. 6d., one at 10s., one day—that is really for the erection, as you have already told us, of these centres? Yes; it works out at £5.
11176. Do you consider now that that is excessive? Of course, I do not consider that it is excessive any more than I consider that many of the other items which have been referred to are excessive. I have pointed out that that is the way I have taken the work. I consider that that is a fair price for putting the centres together. Of course, it may be that I should have taken 7s. instead of 7s. 6d., but I would rather not alter my estimate for a thing of that sort.
11177. Take the next item—making and fixing main carrier, four men at 7s. 6d., and one man at 10s., four days—you have allowed more in that case? Yes; there is more work in the carrier.
11178. The process is more tedious? Yes.
11179. The amount comes out at £8? Yes.
11180. The making and fixing of the carrier is just as tedious, according to your estimate, as is the fixing of the spandrel piers and arch centering? Yes.
11181. Then there is the putting in of the lagging and side-boxing—twelve men at 7s. 6d., or £4 10s.;—are you satisfied with that estimate? Yes, I am satisfied with all the items there.
11182. Your estimate still is that it will cost £33 10s. for removing and erecting, and the work incidental thereto, in connection with the timber work of each span? Yes. I do not in any sense withdraw my estimate

estimate. I should like it to remain, with the correction, of course, as to labour, which I have mentioned to Mr. Parkes, supposing that he has correctly stated the rates. If it should turn out that the labour ought to be 6s. a day, then all I have to say is that it is cheap. I should not have supposed, myself, that it would be 6s. a day.

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11183. *Mr. Parkes.*] Why have you not given us the record of your labour in connection with the construction of these principals? I have given you my measurements according to my habit in these matters. It is a system of measurement I always adopt with bridges. We do not work in the same way as an architect would work in these matters. If I measure up a bridge I measure up the bridge fixed. Just the same thing applies to the price of concrete; my £1 8s. includes the scaffolding and the method of putting it in. That is a parallel case.

11184. But you have included nothing for the labour of putting the thing together? I have not included separately the carpenter's work in making the joints and arranging the timber, and so forth.

11185. Why did you not include it? I thought it better not. It is not the custom, and I should not have thought of doing it.

11186. Would it not be more difficult to do it, seeing that there are only four centres and seventeen spans? It seems to me that this is the most obvious way of making the estimate. I might have gone about it differently had I been an architect; but I think you will find the estimate pretty accurate. The assembling of the pieces and the manufacture of the pieces ready for assembling are quite distinct matters, and that is included in the cost per cubic foot and per ton.

11187. *His Honor.*] But what is the meaning of the removal in this connection if you are referring to the assembling of the pieces after the carpenters have cut them out and put them together? They would afterwards have to be jointed together and put up, and finally they would have to be taken down, I suppose.

11188. The removal would not mean the drawing of the stuff from one arch to another? You would have to take the centering down to a large extent. You could not drag it down bodily. You would have to take it down pretty gently, or you would probably injure portions of it.

11189. Does not the making and fixing practically come to the same thing as the removing, unless the removal means simply the taking down;—as a matter of fact, does the removal mean simply unfixing? Certainly, the centres have to be fixed in position in the next arch, and that would involve a repetition.

11190. A repetition of the item of £27, or whatever the amount may be? Yes; otherwise I should have to include an extra price for doing that work. I have taken the amount out in that way.

11191. I suppose they take the centerings out of the arches in large segments? Yes; it is taken down, to a large extent, in that way. It cannot be taken down bodily.

11192. In how many segments would it be taken down? It is built in three segments. You would have to take the ribs out separately. You could not take out the lagging and all.

11193. *Mr. Parkes.*] How is it actually done, do you know? I should do it in that way.

11194. *His Honor.*] You have not seen the work done, but the chances are that it would be done with as little labour as possible? Yes; of course, one is always liable to correction in an estimate of this kind, because you cannot put yourself in the exact position of the contractors. The contractors themselves would be able to put some of these items right if they are wrong. They will be able to tell you what is actually done.

11195. *Mr. Davis.*] You said, in reply to Mr. Parkes, that 7s. 6d. would be a fair price for Nepean sand? Or good crushed sandstone. I do not know what is actually paid. I know that if I wanted good sand I should have to pay that amount for it.

11196. Mr. Parkes asked you to suppose that sand from the crusher was used in this case; but suppose that sand from a crusher is not used, but that the sand used is brought from North Sydney? Then the price would be altered accordingly.

11197. In connection with the bringing of sand from North Sydney, there would be the freight and the punt charge, and, that being so, you would not consider 7s. 6d. an excessive price? I do not consider it excessive. As I have said, I think it is a fair price.

11198. You have put down the cement at 11s. 6d. per cask? Yes, that is so. I think you will find that that item is all right.

11199. Would you be surprised to find that the rate for the supply of Portland cement in the Public Works Department is 11s. 10½d. a cask? Not at all; because cement has been over 12s. several times.

11200. As a matter of fact, the price fluctuates a great deal? Certainly.

11201. Mr. Parkes asked you some questions relative to the 383 cubic yards of compo. at £1 9s. 8d. He said that, assuming that there were 23·6 cubic yards of compo. in each arch, that would make the quantity slightly more? Yes; these quantities are average quantities.

11202. Assuming that there were 20 cubic yards of compo. in one of these arches, that would make the 383 cubic yards substantially correct? Yes.

11203. The quantities, at any rate, were agreed to by Mr. M'Credie, Mr. Thompson, and myself, as being those which should be adopted for your use? Yes; I am not responsible for them.

11204. Coming to the departmental design and the schedule prices, your estimate is £9,427 8s. 6d., which, with £6,362 2s. (the cost of the tunnels) added, makes a total of £15,789 10s. 6d.—that being the value of the contract at departmental rates? Yes; that is what the Department would have had to pay for it.

11205. Do you think that, seeing that this contract was let in open tendering, and that the lowest tender amounted to 28½ per cent. below schedule rates, and that the rates adopted in this estimate are those rates, that would be likely to be the real value of the work in the departmental design, supposing it were carried out? It is difficult for me to answer that question.

11206. But for all practical purposes you would not say that that would be the real value of the work? Yes.

11207. Assuming that the Department made an estimate which amounted to over £22,000 for the work, and that the lowest tender was 28½ per cent. below schedule rates, amounting to, say, £15,789, that would simply prove that the Department was wrong in its estimate of the value of the work? Yes.

11208. Would you not say, then, that for all practical purposes the £15,789, supposing you had a good contractor who would be willing to take up the tender and go on with the work at that price, was the real value of the work in question? Quite so.

11209.



- W. H. Warren.  
5 Aug., 1896.
11209. It has been given in evidence that Messrs. Carter, Gummow, & Co.'s tender for the departmental design was  $28\frac{1}{2}$  per cent. below schedule? Yes, I understand that.
11210. And their rates worked out at the quantities given in the schedule amounted to £15,757? Yes.
11211. It has also been stated in evidence that the next tender was Mr. M'Sweeney's, amounting to  $25\frac{1}{2}$  per cent. below schedule rates—would you not say that that was pretty conclusive proof that, after all, Messrs. Carter, Gummow, & Co. were not very much out? It is an ordinary difference.
11212. Would it not be pretty close tendering? Fairly close. I have seen it closer.
11213. It would go to confirm the idea that this tender of Messrs. Carter, Gummow, & Co. represented about the real value of the work? You might consider it so.
11214. Or, to put it in another way, would you not consider that the tender at £15,789 would be likely to be nearer the truth even than your own estimate? Certainly. When I made my estimate I took your prices; but the work appears to be worth more—the brickwork especially.
11215. If you were tendering for this job you would put in a tender amounting to £17,660, whereas Carter, Gummow, & Co.'s idea was £15,757—that is the real difference between you, is it not? Yes.
11216. *Mr. Parkes.*] If you knew that you had the right to substitute another job if you had put in the lowest tender, that would affect you when you were tendering, would it not? Possibly. It is quite possible that I might prefer to put in my own plan.
11217. *Mr. Davis.* You prepared an estimate of the cost of the Monier structure without reference to what the contractor might pay his men per day? Yes.
11218. Yours was an estimate of what they would probably pay? Yes; and the same observation applies to all that I have done.
11219. *Mr. Carter.*] If it can be shown that the contractors paid more for wages and more for material than has been suggested this morning, that would show that your estimate as regards those two items is quite within the mark? Yes.
11220. Suppose it could be shown that the pay of certain men engaged upon the work ranged from 10s. to 7s. 6d., what would you say? The probability is that if I had seen those pay-sheets in the first instance I should not have been inclined to make any alteration whatever in my estimate for labour; but I have never seen them before. I have pointed out more than once that I have put in what I considered a fair price against every item.

John Carter recalled and further examined:—

- J. Carter.  
5 Aug., 1896.
11221. *Mr. Parkes.*] Beyond Bandeen, who is the foreman upon Contract No. 77? Mr. Forrest acts as foreman.
11222. Are there any other foremen? Yes. Girling is one, and Crimson is another.
11223. You will find their names opposite the item of "carpenters" on the pay-sheet? They are foremen carpenters.
11224. They do not appear in every pay-sheet, do they? Yes.
11225. Are they not working in the tunnel? No.
11226. Who is putting the timber in the tunnel? There is no timber in the tunnel.
11227. What does Rogers get? He is probably a labourer.
11228. Can you tell us from this book of pay-sheets what men are at work upon Contract 118, and what men are at work upon Contract 77? No, except as regards eight or ten of them.
11229. All of the work in the tunnel is done by piece? Yes.
11230. That is entered in your books? Yes.
11231. All your carting is done by sub-contractors? No; a lot of it is day-work.
11232. Who are the carters on the day-work? Burcombe, M'Millan, Meader, and Booth.
11233. Can you tell me the names of some of the men who are working on the compo. and concrete work? Yes; Bandeen and Girling.
11234. Do they work at the compo.? Yes.
11235. Who else would there be? Cottle.
11236. But he is a foreman? Yes; but he works at the compo.
11237. Can you give us any other names? Yes; there are Byrnes and Kadie. That is all I can pick out from memory.
11238. You cannot remember any more? No.
11239. You have picked out all the costly men? Certainly. They are picked men.
11240. All the rest are 7s. or 6s. a day men? Yes; you asked me about the compo. All the highest paid men are at work on the compo.
11241. You could not tell us the names of all the men who are working on the compo.? There would be about fifteen altogether, I think.
11242. Will that be the general number? No; more often fourteen.
11243. Could you not give me all their names? No; I do not know the names of all of them, although some of them have been working for us for seven or eight years.
11244. *His Honor.*] Do you know their christian names? No.
11245. *Mr. Andrews.*] You do not interfere with the working part of the contract? No.
11246. Some one engaged on the job could give the names if necessary? Yes.
11247. *Mr. Parkes.*] Could Mr. Forrest pick me out in this book of pay-sheets the names of the different men who are working on the two jobs? No.
11248. Why? Because they are never separated, except the concrete gang. There is no distinct work, and if there were nothing doing upon Contract 77 they would be at work on Contract 118. The men are working on both contracts.

George M'Credie recalled and further examined:—

- G. M'Credie.  
5 Aug., 1896.
11249. *Mr. Parkes.*] You had a conference with Mr. Davis, Mr. Thompson, and Professor Warren? Yes.
11250. As a result of that conference you mutually agreed to certain quantities? Yes.
11251. The supplementary specification of Contract 77 sets forth certain things, and one of these things is that the whole of the work in connection with the Monier patent shall be carried out as compo., and not as concrete? Yes.
11252. But you agreed to allow it to go as concrete work? Yes.
- 11253.



G. M'Credie.

5 Aug., 1896.

11253. Concrete of a special nature? Yes.

11254. Do you know whether that work has been carried out? They appear to be carrying it out now.

11255. In other respects you thoroughly agree as to the quantities? Yes.

11256. You formerly presented a report to His Honor, making an estimate of the quantities which you took out of the Government scheme? Yes.

11257. You have now to amend that report; but, beyond the alteration of the quantities, you have not altered the prices? Not materially.

11258. It is for the purpose of amending that report that you present the report which I will now ask you to read? Yes. It is as follows:—

ESTIMATE for "Monier" Aqueducts in Contract No. 77, based upon quantities as rearranged, and according to the work as being executed.

|   |  |       |       |
|---|--|-------|-------|
| 1,533 cubic yards material above skewbacks, comprising—     |  |       |       |
| 383 cubic yards compo.                                      |  |       |       |
| 1,150 " small bluestone concrete.                           |  |       |       |
| 37 tons of iron in grills,—42s. 3d                          |  | £     | s. d. |
| 18½ tons channel iron and tie bars fixed,—£14               |  | 3,238 | 9 3   |
| 15½ " cast-iron cover-plates (fixed),—£12                   |  | 254   | 16 0  |
| 10,625 superficial yards cement rendering (1 to 1),—1s. 9d. |  | 189   | 0 0   |
| 1,016 " " (1 to 2),—1s. 6d.                                 |  | 929   | 13 9  |
| 1,350 cubic yards sandstone concrete,—22s. 6d.              |  | 76    | 4 0   |
| 158½ " bluestone concrete in skewbacks,—40s.                |  | 1,518 | 15 0  |
|   |  | 317   | 6 8   |

£6,524 4 8

ESTIMATE for "Monier" Aqueducts in Contract No. 77, based upon quantities as rearranged, and according to the work as specified, signed as contract, and included in bond.

|   |  |       |       |
|---|--|-------|-------|
| 1,533 cubic yards material above skewbacks, all compo., including 37 tons of iron in grills,— |  |       |       |
| 37s. 2d.  |  | £     | s. d. |
| 18½ tons channel iron and tie bars fixed,—£14   |  | 2,848 | 16 6  |
| 15½ " cast-iron cover plates fixed,—£12   |  | 254   | 16 0  |
| 10,625 superficial yards cement rendering (1 to 1),—1s. 9d.                                   |  | 189   | 0 0   |
| 1,016 " " (1 to 2),—1s. 6d.   |  | 929   | 13 9  |
| 1,508½ cubic yds. sandstone concrete in piers,—22s. 6d.                                       |  | 76    | 4 0   |
|   |  | 1,697 | 5 0   |

£5,995 15 3

GEORGE M'CREDIE.  
W. THOMPSON.

August 4th, 1896.

ESTIMATE for Aqueducts, Contract No. 77. Departmental plans upon the rearranged quantities.

|   |  |       |       |
|---|--|-------|-------|
| 1,848 cubic yards sandstone concrete,—22s. 6d.                |  | £     | s. d. |
| 1,054 " special bluestone concrete,—40s.                      |  | 2,079 | 0 0   |
| 1,859 " brickwork (net cost),—40s.                            |  | 2,108 | 0 0   |
| 12,190 cubic feet moulded freestone (net cost),—3s.           |  | 3,718 | 0 0   |
| 2,682 superficial yards ¾" cement rendering (1 to 1),—1s. 9d. |  | 1,828 | 10 0  |
| 608 " " (1 to 2),—1s. 6d.                                     |  | 234   | 13 6  |
| 92 cubic yards tarred metal,—36s.                             |  | 45    | 12 0  |
| 40 (No.) scupper slates,—2s. 6d.                              |  | 165   | 12 0  |
| 170 lineal feet 4" scupper pipes,—1s. 6d.                     |  | 5     | 0 0   |
| 70 cwt. fixing only iron,—3s.                                 |  | 12    | 15 0  |
|   |  | 10    | 10 0  |

£10,207 12 6

4th August, 1896.

ESTIMATES for "Monier" Aqueducts, Contract No. 77.

|   |  |                        |       |                 |
|---|--|------------------------|-------|-----------------|
| Compo.—   |  | Details of Valuations. |       | August 4, 1896. |
| Material,—2 casks cement at 9s. 6d. per cask  |  | £                      | s. d. |                 |
| " 24 cubic feet of sand at 2s. 6d. per cubic yard                                       |  | 0                      | 19 0  |                 |
| Labour,—mixing, including water   |  | 0                      | 2 3   |                 |
| " placing in boxes  |  | 0                      | 1 6   |                 |
|   |  | 0                      | 4 6   |                 |
| Total, exclusive of iron and timber   |  | 1                      | 7 3   |                 |
| *Small Metal Concrete—  |  |                        |       |                 |
| Material,—10 cubic feet blue metal,—12s. 6d. per cubic yard                             |  | 0                      | 4 7½  |                 |
| " 6 " sand at 2s. 6d. per cubic yard  |  | 0                      | 0 7   |                 |
| " 1 cask cement,—9s. 6d. per cask   |  | 0                      | 9 6   |                 |
| Cost for 15 cubic feet  |  | 0                      | 14 8½ |                 |
| Therefore, material for 1 yard cube   |  | 1                      | 6 6   |                 |
| Labour,—mixing, including water   |  | 0                      | 3 0   |                 |
| " placing in boxes  |  | 0                      | 4 6   |                 |
| Total, exclusive of timber and iron   |  | 1                      | 14 0  |                 |
| Average cost above Skewbacks—   |  |                        |       |                 |
| 383 cubic yards compo.,—27s. 3d.  |  | 521                    | 16 9  |                 |
| 1,150 cubic yards of small metal concrete,—34s.   |  | 1,955                  | 0 0   |                 |
| Total   |  | 2,476                  | 16 9  |                 |
| £2,476 16s. 9d. divided between 1,533 cubic yards gives as average price per cubic yard |  | 1                      | 12 4  |                 |
| Iron grills fixed price per cubic yard  |  | 0                      | 5 9½  |                 |
| Timber as per memo.   |  | 1                      | 18 1½ |                 |
|   |  | 0                      | 4 1½  |                 |
| Total average value   |  | 2                      | 2 3   |                 |
| Iron placed in grills—  |  |                        |       |                 |
| 37 tons, costing £8 10s. delivered and £3 10s. for labour fixing = £12 per ton          |  | 444                    | 0 0   |                 |
| £444 divided between 1,533 cubic yards gives, per cubic yard                            |  | 0                      | 5 9½  |                 |

MEMORANDUM

\* This has not yet been tested as to bulk, the specification not being available.

G. M'Credie.

## MEMORANDUM of Timber in Centres, &amp;c.

NOTE.—Prices given include all making, fixing, and ironwork.

5 Aug., 1896.

|  |    |    |  |          |    |    |
|--|----|----|--|----------|----|----|
| Oregon ribs for four centres—                              |    |    |  | £        | s. | d. |
| 527 superficial feet, 9" x 4½" tie beams—20s. ....         |    |    |  | 5        | 5  | 5  |
| 756 " 12" x 4½" fitch principals—20s. ....                 |    |    |  | 7        | 11 | 3  |
| 419 " 6" x 4½" struts—20s. ....                            |    |    |  | 4        | 3  | 10 |
| 109 " 4½" x 4½" struts—20s. ....                           |    |    |  | 1        | 1  | 10 |
| Oregon connecting ribs—                                    |    |    |  |          |    |    |
| 351 superficial feet, 12" x 4½" fitch principals—20s. .... |    |    |  | 3        | 10 | 2  |
| 162 " 6" x 4½" tie beams—20s. ....                         |    |    |  | 1        | 12 | 5  |
| 34 " 6" x 4½" struts—20s. ....                             |    |    |  | 0        | 6  | 10 |
| 216 " 6" x 4½" struts supporting connecting ribs—15s. .... |    |    |  | 1        | 12 | 5  |
| 54 " 6" x 4½" sill—15s. ....                               |    |    |  | 0        | 8  | 2  |
| 81 " 6" x 4½" heads and sills—15s. ....                    |    |    |  | 0        | 12 | 2  |
| 95 " 6" x 4½" struts to above—15s. ....                    |    |    |  | 0        | 14 | 3  |
| 64 " 3" x 2" braces—15s. ....                              |    |    |  | 0        | 9  | 7  |
| 960 " 1½" top lagging—12s. ....                            |    |    |  | 5        | 15 | 2  |
| 166 " 1" side lagging—12s. ....                            |    |    |  | 1        | 0  | 0  |
| 864 " 12" x 6" uprights—12s. ....                          |    |    |  | 5        | 3  | 8  |
| 432 " 12" x 6" sills—12s. ....                             |    |    |  | 2        | 11 | 10 |
| 133 " 8" x 1" braces—12s. ....                             |    |    |  | 0        | 16 | 0  |
| 210 " 12" x 2½" ribs to small arches—12s. ....             |    |    |  | 1        | 5  | 3  |
| 756 " 1½" lagging to small arches—12s. ....                |    |    |  | 4        | 10 | 10 |
| 495 " 1½" boxing small piers—12s. ....                     |    |    |  | 2        | 19 | 5  |
| 103 " 1½" sides to small arches—12s. ....                  |    |    |  | 0        | 12 | 11 |
| 228 " 1½" boxing to large pier in arch—12s. ....           |    |    |  | 1        | 7  | 4  |
|  |    |    |  | £53 10 9 |    |    |
| Timber for carrier sufficient to do one span = 80 feet—    |    |    |  |          |    |    |
| 1,200 superficial feet, 1½" boarding outside—15s. ....     |    |    |  | 9        | 0  | 0  |
| 1,800 " 1½" boarding inside—12s. ....                      |    |    |  | 10       | 16 | 0  |
| 440 " ribs to above—15s. ....                              |    |    |  | 3        | 6  | 0  |
|  |    |    |  | £23 2 0  |    |    |
| Scaffolding—   |    |    |  |          |    |    |
| 3,200 superficial feet, 8" x 8" uprights—12s. ....         |    |    |  | 19       | 4  | 0  |
| 576 " 8" x 8" sills—12s. ....                              |    |    |  | 3        | 9  | 2  |
| 384 " 8" x 4" heads—13s. ....                              |    |    |  | 2        | 6  | 0  |
| 480 " 8" x 1" braces—12s. ....                             |    |    |  | 2        | 17 | 8  |
|  |    |    |  | 27 16 10 |    |    |
| Labour taking down and putting up centres—                 |    |    |  |          |    |    |
| 1 man at 10s. =  | s. | d. |  |          |    |    |
| 1 " at 9s. =   | 10 | 0  |  |          |    |    |
| 2 men at 7s. =   | 9  | 0  |  |          |    |    |
|  | 14 | 0  |  |          |    |    |
| 33 0 per day for two days, or for each span .....          |    |    |  | 3        | 6  | 0  |
| For 17 spans .....   |    |    |  | 56 2 0   |    |    |
| <i>Summary.</i>  |    |    |  |          |    |    |
| Four centres, at £53 10s. 9d. ....                         |    |    |  | 214      | 3  | 0  |
| Carrier .....  |    |    |  | 23       | 2  | 0  |
| Scaffolding—75 per cent. charged to Monier .....           |    |    |  | 20       | 17 | 7  |
| Labour, placing in position .....                          |    |    |  | 56       | 2  | 0  |
|  |    |    |  | 314 4 7  |    |    |

£314 4s. 7s. divided between 1,533 cubic yards gives 4s. 1½d. per yard.

4th August, 1896.

I may add that, if you deduct the amount of £6,524 4s. 8d., the estimate for the Monier aqueduct, based on quantities as rearranged and according to the work as being executed, from £10,207 12s. 6d., the estimate for the aqueduct, according to the departmental plans upon the rearranged quantities, you get a difference of £3,683 7s. 10d.; and if you deduct £5,995 15s. 3d., the estimate for the Monier aqueduct in Contract 77, based upon quantities as rearranged, and according to the work as specified, signed for in the contract, and included in the bond, from the £10,207, you get a difference of £4,211 17s. 3d. I might state, in connection with the quantities of timber we have taken out, that we went out and looked at the structure. We measured the size of the principals and supporting timbers, and if you compare our totals with those of Professor Warren you will find that there is only a difference of about 900 feet super. in the total quantity, and this difference may be accounted for by Professor Warren taking the 4½ in. timbers as 6 inches. Our calculations are based upon what we are paying from day to day, and from what we know we can get the material delivered at. The difference between the two estimates apparently comes in in the price which Professor Warren has put down for the purchasing of material. This report is made in conjunction with Mr. Thompson. There was a little difference between our valuation of the concrete, the amounts being 22s. 6d. and 21s. In this report Mr. Thompson's price is put in.

11259. You have had a good deal of time to look over this contract, and you will swear that your valuations are, to the best of your knowledge, correct? Yes.

11260. Upon what do you base them? I base them upon what we pay for that class of work. Of course the principals, the timbering, and all that sort of thing, are common to ordinary building construction, and we carried out a great deal of that. We know from the prices which we pay from day to day what should be estimated for that, and I am satisfied that our prices will be backed up by the best builders in the country.

11261. Have you made inquiry of merchants as to the value of material? Yes.

11262. And you base your estimates also upon these inquiries? Yes.

11263.

G. M'Credie.

11263. Have you made inquiry as to the value of labour? Yes.
11264. And your estimates are based on the ruling rates? Yes.
11265. I asked you yesterday to go out to Contract 77 and to make a most accurate measurement of the whole of the timber in the work? Yes.
11266. You made that accurate measurement? Yes; we measured all the constructive timber.
11267. Were your measurements checked by others? Yes.
11268. Were any faults found in the checking? No.
11269. Would there be any difficulty in measuring the timber? No.
11270. Is not all similar timber work measured out by the superficial foot in the trade? Yes. You buy Oregon by the superficial foot, and also hardwood. You would buy sawn hardwood cheaper than hewn hardwood. You can buy sawn hardwood delivered in any part of the city at the prices we have estimated. For hewn hardwood—that is the big timber—you would pay at 1s. 7d. per cubic foot. The other timber would be sold at 9s. 6d., or even as low as 8s. 6d., per 100 feet superficial.
11271. Those prices can be confirmed on reference to the market rates? Yes.
11272. As to the Monier structure,—in taking out your estimate, you have not made any allowance for what would be called contractors risk, have you? No.
11273. Why? The contractors risk is generally covered by the profit. I never heard of such a thing being taken out separately.
11274. What about supervision? The same thing applies to that. Profit is supposed to pay for risk and supervision. The rate paid for supervision comes to about £6 a day; that is for the supervision of a single arch. The Government have their own men to supervise the carrying out of the work. The working foreman is the man responsible for supervising that part of the structure, and he gets 10s. a day.
11275. As to tool-sheds and barrows, and the water-pipes for taking the water to the concrete—the contractors remove those afterwards? They are never included in the contract price.
11276. Did you ever hear of such things being added to the contract over and above the percentage of value? No.
11277. What was your labour for putting in the compo.? It came to more than Professor Warren's estimate for labour. It was 7s. 1½d. as against 5s. 1d. per yard.
11278. You have looked through the departmental plans, including all the tunnel work and work of that sort which is not in the aqueduct itself, and I want you to tell me which bears the heavier profit—the work in the aqueduct or the work in the tunnel? It appears to me, as far as the prices are concerned, that the tunnel bears the heavier profit. The price of the brickwork in the aqueduct, if you reckon it up according to the way it is specified, is very low.
11279. What about the price for sandstone concrete? That is right enough.
11280. Will it bear 28½ per cent. off? That would bring it down to about net cost.
11281. Will the brickwork at £2 10s. bear 28½ per cent off? No; I do not think so.
11282. What would the best bottom block stone, such as you use in buildings of a first-class character, be worth? About 2s., I suppose. I do not know what they are charging now.
11283. Take the best stone which architects use;—how much would have to be paid for it? I have paid as much as 2s. 6d. a foot for good stone.
11284. For specially-picked stone? Yes.
11285. The general price would be about 2s.? Yes.
11286. Can you get the Waverley stone cheaper? I do not know; my experience applies to the best Pyrmont stone.
11287. In connection with this same question, are the prices for excavation at 65s. a yard and 60s. a yard excessive? I have not gone into the tunnelling part of the contract at all. I merely glanced through the prices.
11288. But what effect would they have upon the general contract if 28½ per cent. were taken off;—what portion would it most affect? I do not understand that the contractors make up their prices in that way at all. The 28½ per cent. is only a sort of guide to them. They take their estimates and put them down together, striking their prices opposite each item; and they then put down the amount for which they are prepared to do the work.
11289. But what items will best bear the 28½ per cent. off? I have not looked into that matter at all. I have been fully occupied with the aqueduct.

William Thompson recalled and further examined:—

11290. *Mr. Parkes.*] You formerly presented a report as to the value of the Monier arch, independently of Mr. M'Credie? Yes.
11291. You made that report upon certain calculations which you made yourself, and upon the calculations of the Department? Yes.
11292. You agreed in conference to certain quantities? Yes.
11293. Therefore it is necessary that you should alter your former valuation as far as those quantities are concerned? Yes.
11294. But not as far as the values are concerned? No.
11295. You now, in conjunction with Mr. M'Credie, have settled between yourselves what prices were the ruling prices during the time this work has been carried out, and you endorse the report which Mr. M'Credie has presented? Yes, in every particular.
11296. With reference to the timber which has been used on Contract 77, you yesterday accompanied Mr. M'Credie when he went out to take the measurements? Yes.
11297. Do you feel sure of the measurements you then made? Yes.
11298. As to the values of the material included in the report which Mr. M'Credie brought up, can you guarantee them? Yes. I can guarantee them as fair values.
11299. Upon what are they based? Upon our daily practice. They are prices which we pay every day.
11300. For whom would you be doing this pricing work? For contractors.
11301. For the general contracting public? Yes.

W.  
Thompson  
5 Aug., 1896.

George M'Credie recalled and further examined:—

- G. M'Credie. 11302. *Mr. Davis.*] Do you know of your own knowledge the practice of contractors in preparing tenders upon Schedules similar to those in use in the Sewerage Branch? Yes.
- 5 Aug., 1896. 11303. Do you know what the practice of Messrs. Carter, Gummow, & Co. is in that relation? No; I do not know anything about their practice.
11304. You do not know what they would do in putting in their tenders for Contract 77? No.
11305. You are not in a position to say whether they would take a percentage off one item and a percentage off another item? No; I did not say they did.
11306. How long ago is it since you paid 3s. 6d. per foot for Pymont block stone? When the Post Office was being built.
11307. That is a good while ago? Yes.
11308. It would be about 1880? I cannot say. It is a long time ago.
11309. Things are slightly altered since then? Yes.
11310. You appeared to have compared the cost of the work in the tunnel with the cost of the work in the aqueduct in this particular contract? No; I have not had anything at all to do with the tunnel. My instructions were to compare the aqueducts, and I am not prepared to go into matters affecting the tunnel unless I go thoroughly into the whole contract.
11311. But you answered Mr. Parkes' question as to the profit or otherwise likely to be made upon the tunnel as compared with the aqueduct at the rates given in the schedule? I think I have made it sufficiently plain that I will not deal with any matter into which I have not gone very carefully.
11312. You are continually getting tenders for engineering and architectural work, I suppose? Yes.
11313. I suppose it is the practice of your firm to recommend your principals to accept the lowest tender you receive for any given work, as a rule? As a rule, providing the contractor is a good man.
11314. Supposing the tenderer is a good man, you would recommend your principal to accept the tender? Yes; if the tenderer were willing to take up the work.
11315. Even although you thought the tender a very low one? Yes.
11316. Let us go a step further;—supposing the tender were accepted, would it represent the value of the work to the owner of the property? I should think so.
11317. Supposing that before the tender were received you had made an estimate of the work, and the tender did not quite correspond with your estimate—suppose it was, in fact, the lowest, and that it rather astonished you—still you would say that if the tenderer were a good man, and were prepared to carry out the work at the price given, that would be the value of the work after all, and that your value was only an estimate? I should not bother further about it if I took the tender.
11318. But would you look at the matter in that light? I should regard the value of the work as corresponding to the price the tenderer would do it for.
11319. *His Honor.*] You would consider that the tenderer knew something more about market prices than you yourself did? Yes.
11320. *Mr. Davis.*] Have you had cases where you have received exceptionally low tenders, and where, in your judgment, the tenderer was not very wise in attempting to carry out the work, but has, nevertheless, carried it out? Yes; I have received tenders where the amount has been low, and where the work has, nevertheless, been carried out.
11321. You say that as regards the quantity of timber used in connection with Contract 77 you practically agree with Professor Warren? We make 900 feet super difference.
11322. The chief difference between you and Professor Warren is as regards the price of the material? Yes.
11323. You have allowed, as regards boxing, a length of carrier to one span of 82 ft. 6 in.? Yes.
11324. Do you consider that that is sufficient boxing to allow for this great length of carrier? Yes.
11325. You think that the boxing would be able to endure being taken up and put down some thirty times? Yes; I think there is enough margin in our prices to cover all that.
11326. You think that the length of boxing would endure that treatment? Yes, I think so.
11327. Will you elaborate a little your idea of the cost of supervision;—you made a statement to the effect that the allowance of £375 for supervision means about £6 a day;—will you say how you arrive at that conclusion? I am dealing with the price per yard of the compo. in connection with the supervision.
11328. But how did you come to the conclusion that £375 for supervision would amount to about £6 a day? There is an arch put in in a day; that would be 23 yards. The price per yard is 5s. for supervision, and that comes to £5 15s. for supervision. I do not recognise that the contractors have any right to charge for supervision. That is included in the profit.
11329. You think it is fair to put it in the way you have indicated? Yes.
11330. You think it would be fair to treat a man capable of supervising that work in that way? That has nothing to do with it.
11331. You put him on to the work when you want to turn an arch, and then you tell him to go adrift and do the best he can in the interval? I never heard of such a charge being made in my life, and I have been through a good many quantities in connection with contracts.
11332. How many centerings in connection with the main arches have you allowed for? Four.
11333. When did you make the discovery that you had made a mistake of two? I did not make any such discovery. When I was over on the work before there were only two centerings there, but when I went there subsequently there were four.
11334. Will you swear that when you were there before there were only two centerings upon the Johnstone's Creek and White's Creek aqueducts? I will swear that I saw only two, but I have allowed for four now.
11335. What is the price of compo. in your former estimate? Without iron, 30s.; with iron, I think I brought it to £2 2s. 6d.
11336. And now your price is 42s. 3d.? Yes. That explains itself afterwards, because more ironwork was put in the compo. than we put in.
11337. There is a difference between your former estimate and the one now made of 3d. per yard? Yes; we put in the other iron.
11338. You said, perhaps inadvertently, that Professor Warren's price for labour was about 5s.? I think it runs out at that.
11339. You mean for putting the concrete in position? Yes.

William

William Thompson recalled and further examined:—

W.  
Thompson.  
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11340. *Mr. Parkes.*] Did it ever occur to you to see where the profit lay in the Departmental scheme for Contract 77? No; as I said before, I do not know much about the value of the tunnel work—the gadding and blasting, and so forth—but I know that there would be a dead loss on the aqueduct with 28½ per cent. off. It would be ridiculous to take 28½ per cent. off the brickwork and the moulded stone. You cannot take every portion of the schedule in that way. [*Vide Appendix No. 42.*]

11341. Does not that show that 28½ per cent. must come off the other work? It shows that the other work might stand more than 28½ per cent. off. 28½ per cent. off the brickwork would bring it down to 35s. 9d., and we allowed £2, and the stone to 2s. 6d.

11342. Have you looked at the tunnel and concrete work, and other work generally, outside of the aqueduct? All that I did was to take the Government quantities once.

11343. *Mr. Davis.*] In making one of your former estimates in connection with Contract 77, including the footings, you brought out a total of £6,629 16s. 8d.—I mean the estimate concerning which you say you have checked the various items in the Government schedule? Yes; that was your own money. All that Mr. Parkes asked me to do was to take the quantities. I cannot touch upon the value of the tunnel and excavations.

11344. But, at the schedule rates, you agree that the work in the tunnel is £6,629 16s. 8d.? Yes.

11345. Will you tell His Honor whether you consider that the work in the arch of the description shown in the Departmental plan for Contract 77, in brick, is worth more or less than the small arch in the tunnel, 4½ inches thick? The only particular in which the 4½ inches would increase in value would be in the extra centerings, but work of the class you have in the aqueduct—white and red double-pressed brickwork—is the most expensive class of brickwork you can have.

11346. Supposing the same class of brickwork was specified for the tunnel as for the aqueduct, what would you say then as to the relative value of the two classes of work? They would run on parallel lines as far as value is concerned.

11347. Would you say that the 4½-in. brickwork in the tunnel was more costly than the thick brickwork shown in the aqueducts? No, I would not say that at all. You could not get more expensive work of the kind than you have in the aqueduct. The only additional cost would be the extra centering in the tunnel. In ordinary building operations the bricklayers do not reckon much on the thickness of the wall.

11348. Would it add to the cost, the extra centering in the tunnel? No; very little.

11349. Confine yourself to the labour entailed in putting in the brickwork in a thick arch such as I am pointing out;—do you think a bricklayer would lay more or less bricks in that arch than in a 4½-inch arch? He would lay a little more in the thick arch; but then there is the whole of the facing to be considered, and also the parapets and spandrels.

11350. Taking that into consideration, which brickwork would cost more—the thin or the thick? The thin would cost a little more, so far only as concerns the arches.

11351. Taking all things into consideration, would you say that the cost of thick brickwork is more than that of the thin brickwork? In this particular case I do, because the aqueduct work has to be neatly struck, whereas the tunnel work is rough.

11352. Have you had anything to do with the receipt of tenders? Yes.

11353. Do you know whether it is the general practice to accept the lowest tender, providing the tenderer is a substantial man? Yes. Other things being equal, of course, the lowest tender would be accepted.

11354. Would you regard the lowest tender for a job as representing the value of the work? By no means.

11355. Supposing you made an estimate for some work and found that you had a tender 20 per cent. below it, would you say that your estimate was the true value of the work, or would you say that the tender 20 per cent. below your estimate was the true value? I would not say that the tender was the true value.

11356. Would you say that your estimate would be the true value? It might be.

11357. And the tender might also be the true value? Possibly.

11358. You know Mr. M'Sweeney—supposing a man of his standing, who is pretty familiar with the value of work generally, and more especially sewerage work, and who has been engaged for some years in putting in tenders, put in a tender for Contract No. 77 25½ per cent. below schedule, and that Messrs. Carter, Gummow, & Co. put in another tender 28½ per cent. below schedule, you would say that Messrs. Carter, Gummow, & Co. were not much out in their idea of the value of the work? Not on the work as a whole, for the percentage is taken off the schedule as a whole and not off any particular items.

11359. Do you know what they did in respect to Contract 77? I know that that is the only possible method of arriving at a percentage on the cost. It is necessary to take a percentage off the whole.

11360. You say the cost of the brickwork in the tunnel and the cost of the brickwork in the arch will be pretty much the same? It may be as far as this particular work is concerned; but, as to that, there are 1,850 yards in the one case and 150 in the other. I do not see where the comparison comes in.

11361. Suppose you had alternative tenders, one at £15,500 and another at £15,757, and that they represented different designs, and that after examination you concluded that these designs would answer the same purpose and that they had equal merits—supposing that to be the case, and that you had to decide which tender to accept, which would you take, the lowest or highest? In taking the alternative tender you have nothing to guide you.

11362. But which would you do? I would not take any price without competition, because £15,500 might not represent the value at all, being the only tender for the alternative design.

11363. Your quantities and prices are, to the best of your belief, correct? Yes, the amended ones.

11364. Your prices are based on the present market value of the work? No.

11365. Not the market value of the work twelve or eighteen months ago, but its market value at present? We have taken the old value as regards timber, &c. Oregon is cheaper now, and the same remark applies to hardwood and cement.

11366. You took the old rates for timber, then? Yes; they are cheaper now. Cement is also cheaper now.

11367. You took the old price for cement? 9s. 6d.

11368. To what period did that apply? To the last ten or twelve months.

11369. You did not take the price of cement fifteen months ago? No, but it altered very little.

11370. *Mr. Parkes.*] The prices you took were from information given to you as to actual payments made by Messrs. Carter, Gummow, & Co.? Yes. As to the cement, I understood that the price was 9s. 6d.

11371. The full value, with cartage, would be 10s.? Perhaps so; but 9s. 6d. is what we allowed for cement.

11372. That is the purchase value? Yes.

FRIDAY,

FRIDAY, 7 AUGUST, 1896.

Alexander Dean sworn and examined:—

- A. Dean. 11373. *Mr. Parkes.*] What are you by profession? A builder and contractor.  
 7 Aug., 1896. 11374. What has been the length of your experience? I have been fifty-three years in the building trade and forty years a builder.  
 11375. Have you carried out much work in the city of Sydney? Yes, a good deal.  
 11376. Have you done other contract work outside of building construction? No; my work has been principally building construction.  
 11377. Have you had any experience in concrete? Yes.  
 11378. Has it been extensive? Very. I have laid the foundations of some very big buildings with it, and I have built altogether in concrete.  
 11379. Have you also had a good deal of experience in the making of cement mortar? Yes.  
 11380. What is your opinion of the crushed sand made from sandstone from the neighbourhood of the city of Sydney, used as a sand in the making of cement mortar? I would not use it at all. It is of a loamy, fatty nature. It will make a good mortar, but it kills cement.  
 11381. In what way? The fatty or loamy substance does that.  
 11382. Can you mention instances in which this has taken place? Many. I remember that on one occasion I was arbitrator on a large job, or dispute about several matters, cement being among them. I was surprised to find the mouldings had fretted away, and I could not make it out. Evidence came before me with reference to the use of loam, and, on going to the building and using a magnifying glass, I found that loam had been used. It makes clean mouldings, but it frets away; it will not last.  
 11383. Have you tested the sandstone round about the city of Sydney at any time? Yes.  
 11384. I mean as to its nature? There could not be better stone in the world than the Pymont stone. The sandstone otherwise is good for building, but it is not good for work upon which there is much wear and tear, such as kerbing and guttering.  
 11385. What causes the fretting away in the case of buildings? There are many causes. The stone is something like timber; it wants wet and sun. If the stone is put in a position where it may become wet and where the sun does not get to it, it will fret away.  
 11386. If there were no clay or fatty substance in it would it fret? Not nearly so much, especially the Pymont stone; it very seldom frets.  
 11387. Have you examined the drawings of the aqueducts which are being built at Johnstone's Creek and White's Creek? I have seen them, but I have not examined them carefully. You must bear in mind that I do not know much about bridges or sewers; I am more in the building line. I have done a lot of sewerage in connection with buildings; but I do not profess to be a judge in matters concerning main sewers. My sons are both more in active business than I am now; and they, I am sure, will be happy to give you the information.  
 11388. You notice that the carrier and the arch in the Monier design is a very light structure;—if the arch were built of 3 to 1 compo., and the upper structure of 5, 3, and 2 bluestone concrete, the sand being crushed from stone taken out of the ground in the vicinity of Annandale, would you say that the material in the structure would be free from shrinkage? It would not.  
 11389. Does concrete, when it has once shrunk, expand again. No.  
 11390. Is that your experience? Yes. When it has once set it is always set, if the work is faithfully done.  
 11391. If the sand is from stone obtained in the district of Annandale, you think there would be likely to be a shrinkage in the works? Yes.  
 11392. Do you think the presence of an iron grill, composed of bars of 3-8ths and 3-4ths in thickness would prevent the shrinkage? No.  
 11393. Suppose there are mastic joints here and there in the superstructure, and that a portion of the arches and piers have not mastic joints, what then would be the effect of the shrinkage upon the lower portion of the structure? It will shrink and, I suppose, crack.  
 11394. It will then leak? Of course if it shrinks and cracks, that would cause leaks.  
 11395. You know Nepean sand very well? I know it well.  
 11396. Is it good sand? It is the best sand in the world. I may state that in 1871 or 1872 I was building a large warehouse. The mouldings and decorations in front were very extensive. I was afraid to use the Surry Hills sand, and not knowing the Nepean sand I sent down to Melbourne for forty or fifty loads of Yarra Bend sand. I wanted to get rid of the fat which I have spoken of. That sand came up, and was used in the work.  
 11397. The Yarra Bend sand is disintegrated bluestone, is it not? No; it consists of small crystals; it is a splendid sand. I was about to say that we had just as good a sand in the Nepean sand, but it was not known at the time to which I refer. There is no better sand in the world than the Nepean sand.  
 11398. Have you ever seen crushed sandstone used by private architects in the city as sand in building construction above ground? No.  
 11399. Have you ever been asked to use it? No.  
 11400. Do the architects and builders shirk using it as being dangerous? I would not use it.  
 11401. What has been your experience as to the standing of concrete in long lengths without shrinking? I have used concrete in long lengths, and I never remember a single shrinkage where bluestone and first-class sand were used.  
 11402. After the material has once set? After it has once set; for instance, Mr. Tooth's house at Darling Point is built on sand. The whole is in concrete, and it is not cracked. I am referring now to the foundations.  
 11403. That would be work underground, but what about the work above ground? I could not say as to that.  
 11404. In the making of the composition, it is an essential thing that you should have the very best of material? Yes; it is the cheapest in the long run.  
 11405. You have looked at the prices put down against the Government quantities for this work by Mr. George M'Creddie? Yes.  
 11406. What do you think of them? I think they are very fair prices. I have not only been over them myself, but my sons have been over them, and we found the prices fair in every sense of the word. I have not one objection to raise in connection with them.

11407.

11407. You have a good knowledge of the price of labour and material in and around the city? I am not so closely in touch with it as I was some years ago. My work now is more in the nature of superintendence. A. Dean.  
7 Aug., 1896.
- 11407½. Will you look up the tender-sheet in detail in Contract 69? Yes. [*Vide Appendix No. 43.*]
11408. You and your son tendered for that job? Yes.
11409. You will find that the first four items are put down by Carter, Gummow, & Co. uniformly at 9d. The next eight or nine items are put down uniformly at 27s. 6d. Then follow four items at 4s.; further on you will find a number of items at 1d., and then there are a series of items at £16 each;—no other tenders are fixed up in that fashion? None as far as I can see. It is one of the most glaring things I ever heard of.
11410. Did you ever see a tender sent in in that way before? Never in my life. My son called my attention to it yesterday.
11411. Would you like to send in a tender in that way unless you had some previous arrangement in regard to it? I have never seen such a thing in my life before. How could they possibly have gone into the matter, and have put down about twenty items in succession as £16 each. Then there are others at £1 and others at 9d.
11412. You think the contractors could not have worked the thing out? It is utterly impossible that they could have done so.
11413. You think these amounts must have been put down for some special reason? I cannot say. I never noticed it until yesterday. I never saw such a thing before. If you compare it with the other tenders you will find that in those tenders there are scarcely any two items of the same value.
11414. Have you ever heard of a tender such as that receiving consideration? It is most astonishing to me. I cannot account for it in any way.
11415. Carter & Co's price was £45,207, your tender was £58,165, or about £13,000 above them. If you take item No. 8, heavy blasting, at £1 7s. 6d., what do you find your own price to be, the price I have just named being that of Carter, Gummow, & Co.? 18s.
11416. Take the item for bluestone pitchers;—the price given by Messrs. Carter, Gummow, & Co. is £50, is it not? Yes.
11417. What is the price in your tender? 30s.
11418. Taking the prices of Messrs. Carter, Gummow, & Co. right through, from the excess of excavation, and one thing and another, they were finally paid £54,000 for the work? Yes.
11419. If you and your son had been allowed to work upon the same items in the schedule, then comparing your prices with Carter, Gummow, & Co.'s, that would have greatly reduced your tender? Decidedly.
11420. The amount would be £3,000 below Messrs. Carter, Gummow, & Co. when the work was completed? Yes, it would be something like that. I have not gone into the figures.
11421. What idea does that suggest to your mind? I cannot tell you what it suggests; it is so utterly foreign to my knowledge of business matters. It is most extraordinary that all these items in Messrs. Carter, Gummow, & Co.'s tender should come out in the same way, and then that we should charge 30s. for bluestone pitchers while their price was £50. I cannot account for it at all.
11422. There being 12 yards of bluestone pitchers at £50, would you expect to get the number increased to 38, the increased quantity being paid for at the rate of £50 a yard? No.
11423. Did you ever receive such good treatment as that at the hands of the Government? Never.
11424. Then as to the subducts, you notice that they were put in at 1d.? The thing is ridiculous. [*Vide Appendix No. 44.*]
11425. Even supposing they facilitated work on the part of a contractor, you think the price is absurd? Yes.
11426. Would you expect to have to carry them out in connection with your contract? Yes; according to the specification they should be carried out.
11427. Did you ever see a schedule rigged like this in your life? Never in my experience have I seen so many items in a tender come out at the same figure.
11428. What would you think of those who took into consideration such a tender? I really cannot tell you.
11429. What do you generally allow as profit upon a contract—what percentage? That is a rather difficult thing to say in these times. I would be satisfied with 10 per cent.
11430. Would that cover all your supervision? Yes, plant and everything.
11431. It would include your plant, you say? Yes.
11432. In building construction, when a contractor puts up sheds, scaffolding, centering, and things of that sort, does he generally charge those things at their full value against his employers? I should regard them as part of my plant.
11433. And you would take them away for further use on the completion of the contract? Yes.
11434. Did you ever hear of a contractor charging for the houses in which he keeps his materials, his barrows, his tools, and things of that sort used on the job? No; that is part and parcel of the contract. You have the building for the protection of the materials and tools.
11435. But would you add anything on to the contract for it? No; but in some cases some allowance is made for the clerk of works' box, and that sort of thing.
11436. Do you put it in your tender? It is part of the tender.
11437. But do you put on to the tender an amount for tools, barrows, and sheds—things which you remove when the contract is completed? No.
11438. Would you also charge for the water-pipes which are laid to take the water to the concrete? No.
11439. That would not be added to your tender? No.
11440. Would you charge, in addition to the 10 per cent. you have named, 5 per cent. for the supervision of the work? No.
11441. Supposing you were making a centering of entirely new timber—supposing you were making the centre, not under an ellipse arch, but under a segmental arch of 82 feet span, would you think that £34 for labour was a fair price or otherwise? I should think it a very heavy price, but I should have to work the thing out before I could give you a definite answer.
11442. The price I have quoted would include erection and removal? It would take some time to calculate it up.



- A. Dean.  
7 Aug., 1896.
11443. In constructions of that sort you do not put a new principal under every arch; you shift the centering which has been previously used? I could not say; it would depend upon the construction.
11444. But generally you would shift the centering along? Yes; in any sewerage work which I have done I have shifted the centering as you say, but a good deal would depend upon the job. Circumstances alter cases.
11445. Take 3, 2, and 1 concrete, the proportions in the work you have had to do with, and generally run out by the yard—that is, over the whole work;—the 3, 2, and 1 are supposed to be the dimensions of every yard? Yes.
11446. You are paid by the yard? Yes.
11447. By the yard containing those dimensions? Yes; if the specification says that the concrete is to be 3, 2, and 1, you put those proportions in.
11448. To every yard? Yes; in other words, we take three bucketfuls of stone, two bucketfuls of sand, and one bucketful of cement.
11449. It is essential in good concrete work to have uniformity, is it not? Yes; the more uniformity there is the better the work.
11450. There must be so much cement in each yard? Yes.
11451. In proportioning the work that is one of the things to be observed, is it not? Yes.
11452. *Mr. Davis.*] In preparing a tender I suppose you provide the prices at which you tender for the work for some use;—for instance, you have a price for the plant you may use upon the proposed work? Never.
11453. Do not you include that in the amount of your tender? Not specially. We have our plant. It is there, and it is shifted from one job to another.
11454. But you take into consideration the fact that you have bought plant? I am able to tender at so much less, because I have the plant. If I had no plant I should put down the cost of it.
11455. When I asked you just now whether you had a price for plant, what I meant was this: that it is not usual for builders and contractors, even in respect to plant, to give it for nothing? If I have all the necessary plant and appliances I tender accordingly. It will be part of my profit. I know that I shall not have to buy it.
11456. Coming to the schedules, I will read you some prices from your own tender for Contract 69. Take item No. 23. You have 20s. per lineal yard for subducts in hard rock, and 10s. for subducts of 6-inch internal diameter, 15s. for subducts of 9-inch internal diameter, 18s. for subducts of 6-inch internal diameter, and 20s. for subducts of 9-inch internal diameter. I want to know whether you consider that that represents the true value of the earthenware pipes? I did not take out these quantities myself. You are asking me questions about a matter I know nothing of.
11457. But you expressed an opinion as to 1d. per yard being a ridiculous price—what would be the price of a 6-inch pipe per yard? I could not say from memory. I daresay it might be about 1s. a yard, but I could not answer the question definitely.
11458. You had a very decided opinion about the price of 1d. per yard? Yes.
11459. Would you not think that your price of 20s. a yard for 9-inch pipes, and 18s. per yard for 6-inch pipes would be equally ridiculous? That would be in hard rock. You might have to go 6 feet or 4 feet deep.
11460. But you get paid for the excavation apart from the subduct? This price is for subducts in hard rock.
11461. If you had obtained this job at your prices would you have objected to lay the 9-inch pipe? I take it that this price includes the work in the hard rock and everything.
11462. What would you consider the value of timber for ordinary sewer work, supposing you had to leave it in when it had once been put in? I could not answer your questions upon these points. I did not take out the quantities; they were taken out by my son.
11463. Will you look up item No. 21 in your tender—timber and iron in excavation? Yes; the price is 6s.
11464. Do you consider that a good price per cubic foot? I think so.
11465. You would like to get it? Yes; but there is nothing particular about it.
11466. Does it not resolve itself into this—that you are as deep in the mud as Carter, Gummow, & Co. are in the mire? I do not think you should impute motives like that. I have simply given you the result of my experience.
11467. I am merely going by your own schedule? I am willing to answer any question relating to my experience, but I cannot answer questions as to these quantities.
11468. *His Honor.*] I understand that you had nothing whatever to do with the taking out of the quantities? No, they were taken out by my sons. I should like to say that I had a very important business engagement this morning which will necessitate my attention, but I will be very glad to answer any further questions on Monday.
11469. You will attend for the purpose of cross-examination on Monday morning? Yes.

William Gilliver recalled and further examined:—

- W. Gilliver.  
7 Aug., 1896.
11470. *Mr. Parkes.*] Since you gave your last evidence you have been carrying out a contract in which concrete is used, and in connection with which you have been using bluestone pebbles from the Nepean River? Yes.
11471. How do those pebbles run? We screen the gravel through a  $\frac{3}{16}$ ths screen. That has been approved by the Department.
11472. What result do you get? In 5, 2, and 1 concrete we get  $24\frac{1}{2}$  cubic feet.
11473. That is including the small pebbles? Yes. Everything which does not go through the  $\frac{3}{16}$ ths screen, from 2 inches downwards.
11474. As to the making of sandstone concrete, what is the course followed by the contractors under instructions from the Department upon these works? We have always forked the ballast.
11475. Is that done under instructions? Yes.
11476. What is the fork? It is a ten-pronged fork.
11477. Is it a regulation fork? It is the fork that is always used.
- 11478.

11478. With regard to the practice of contractors, is it a fact that they add 5 per cent. for supervision, in addition to the percentage which they put on for profit;—I presume you have a general knowledge of the mode of contracting? Yes. Years ago we used to put on 10 per cent. for supervision and profit. W. Gilliver.  
7 Aug., 1896.
11479. *His Honor.*] You mean 10 per cent. on to what you anticipate would be the actual cost of the work? Yes. At one time we used to put on 25 per cent.
11480. *Mr. Parkes.*] In making out your tenders under the new system of tendering, where the Government give the quantities and prices, and you give a percentage tender, your percentage would be a percentage proportioned right down the items? In some cases.
11481. You look at the items to see which are small and which are large;—that is the course you follow? Yes.
11482. How do you make out your own tenders? To what contract are you referring?
11483. To any contract? Take the Wallsend and Plattsburg sewer, which is completed. In that case, the Department gave us quantities and prices. The whole of the prices, with one exception, were too small, and we took off  $22\frac{3}{4}$ ths per cent.
11484. But how did you work it out to arrive at that conclusion? We took the losses on some particular items and the profits on others.
11485. And then you averaged it? Yes.
11486. *His Honor.*] You first went through the whole thing, and made what you thought a fair schedule? Yes. For instance, a contractor would have to take into consideration whether the bluestone concrete and sandstone concrete are at good prices, and then it has to be considered whether the quantities are likely to be altered. If in certain cases one class of concrete were knocked out and another substituted it might involve a big loss to the contractor.
11487. In connection with Contract 77, do you recollect what portion of the work bore the best profit? The tunnel and lining and the shafts. I took the aqueducts at schedule prices. I made my tender  $18\frac{3}{4}$ ths per cent. below, taken over the contract as a whole.
11488. You took the price of the aqueduct to be fairly represented by the schedule rates? Yes.
11489. If the work had been for the aqueduct alone, you would have tendered at schedule rates? Yes.
11490. *Mr. Parkes.*] As to the gauging of concrete, you consider that the gauge should run proportionately to the yard, do you not? Yes.
11491. Ought good concrete to have a uniform proportion of cement per yard? We invariably carry out the specification.
11492. *His Honor.*] Do you find that it bulks equally throughout, or that it varies in its bulking when you put in the same proportion of stone, cement, and sand;—do you go into the question of what it will finally come out at in the bulk? No, except as regards the different classes of material, not as regards the cement itself.
- 11492 $\frac{1}{2}$ . *Mr. Parkes.*] Will you describe the way in which you mix your concrete? We put 20 feet of stone, 8 feet of sand, and a cask of cement on top of that. It is mixed dry, and is then mixed wet; it then goes into the work. That is as regards sandstone concrete. The same thing will apply to bluestone.
11493. In the case of the sandstone concrete the ballast is forked? Yes.
11494. Is that done in the case of the bluestone concrete? No.
11495. *His Honor.*] The question is this, having done that, do you afterwards go into any calculations to find out what bulk the concrete actually makes after mixing? No; that can only be done by putting it back into the gauge-box.
11496. Have you done that? Yes.
11497. You mean, I suppose, that you have done it occasionally as an experiment? Yes.
11498. But running through the work you would not make that calculation? No; we only know the quantity of cement used on the job and the number of cube yards that would be paid for, and we average it in that way.
11499. Do you afterwards go into a calculation to find out what relation there is between the quantity of cement paid for and the quantity of concrete used? Yes.
11500. To satisfy yourself that your men have kept up to the mark? Yes.
11501. You do do that? Yes.
11502. *Mr. Parkes.*] What is generally the result in the case of the bluestone concrete—how much cement goes to a yard of concrete? We do not try it by the yard in that way. I have told you on a former occasion the quantity we get out of the cask.
11503. Suppose you had obtained the contract for No. 77 upon the Monier plan, would you expect to receive in addition to your percentage of profit, whatever it might be, a sum for supervision? No.
11504. Would you expect to receive a sum for the complete value of your centering, your plant, and the timber on the job? No, we generally consider that in making our tender.
11505. *His Honor.*] Take the centering, for instance;—in making up your tender originally do you expect to have some value for it afterwards, or do you expect the contract will practically use up the whole value of the centering? We have used one lot of centering in a third contract.
11506. The centering would come in again and again? Yes. But if a contractor were going to discontinue contracting, and were going to sell the centering, he would only get a firewood price for it. At least that is our experience.
11507. *Mr. Parkes.*] Take the sheds, the barrows, and tools—are they of any value to the contractor after the work is done if he is going to continue contracting? Yes.
11508. They are not charged at their neat value? No; we do not go into it in that way at all. We have our plant.
11509. *His Honor.*] But you allow yourselves something in making out your tender for the wear and tear of plant, do you not? Yes. We have a big plant—three or four different kinds of plants stored at the present time. For instance, we have a railway plant and a pipe-laying plant. We have not used them for some years, and we could get comparatively nothing for them; but if we got a job on a railway, for instance, that plant would give us an advantage over a contractor who had to go into the market and buy plant.
11510. Suppose there were a single big job which you were tendering for, you would put into your tender the cost of your plant, but if it were a moderate job, and you were tendering first for one job and then for another, you would consider in your tender merely the wear and tear? Yes; if we had a plant in stock lying idle we should consider that we had a pull over the other contractors, and we might go a bit cheaper than we should otherwise do. If we had no plant and had to buy it, then we should have to take plant into consideration.

- W. Gilliver. 11511. *Mr. Parkes.*] If you had been carrying out this work would you have charged the full value of all the material in the centering and boxing and have added that to the contract? I told you on a former occasion how I arrived at the cost of the Monier work. I think I put down something like 2s. 6d. a yard for the timber right through the structure.
- 7 Aug., 1896. 11512. You consider that a fair value? Yes; of course you would not make a new centre for each arch. If the arches were all the same you would shift the centering from one place to another.
11513. *Mr. Davis.*] As regards the packing of sandstone concrete over the tunnel arch—if a full batch of concrete is not required to be used at once, would it not be the practice to take a certain quantity of cement out of the barrel and gauge just what might be wanted? Yes; I did not quite understand your question about that the other day, but I thought of the matter afterwards.
11514. What I now say is the custom? Yes.
11515. It is the custom, unless you are using a whole cask at once? Yes. The labourer on the top of the shaft would take a bucket of cement and the proportionate quantities of stone and sand provided for by the specification, because the specification says you are not to use concrete which has been standing any time. It would be half set and would be comparatively valueless.
11516. Referring to the relative values of the brickwork in Contract 77, would you consider that the labour in the 4½-inch brickwork in the tunnel would be less or more than the labour in the thick brickwork, such as that you see in the drawing before you—that is in the aqueduct? The aqueduct in the original plan of Contract 77 had a good deal of fancy brickwork about it.
11517. But confine yourself first of all to the labour;—would it be more or less costly to lay 1,000 bricks in the arch of the aqueduct? It would be more costly in the tunnel, especially if it were 4½-inch work.
11518. Supposing, again, that the same bricks were specified for the aqueduct as for the tunnel, would there be any difference in the cost of the bricks? I think there would be about 5s. difference between the radiated and square bricks.
11519. They are not the same price? No; I think the difference just now is about 5s.
11520. Which would be the more expensive? The radiated brick.
11521. And where would the radiated bricks be used? In the tunnel.
11522. So that in respect to labour and the cost of bricks the tunnel brickwork would be more costly than that in the aqueduct? Yes.
11523. As to the concrete, would the labour of putting the concrete into the piers supporting the arches of the aqueduct be more or less than the labour of putting the concrete in the tunnel invert? It would be considerably less.
11524. So that when you come to compare the cost of the lining to the contractor, compared with the concrete in the piers, and the cost of the brickwork in the tunnel to the contractor, as compared with the brickwork in the aqueduct, the comparison, as far as the contractor is concerned, would be in favour of the aqueduct? Yes.
11525. You have told His Honor that it is the custom for the contractors to fork the sandstone metal? Yes.
11526. Have you at any time, after the forking of a heap of metal has been finished, asked and obtained permission to screen the small stuff which has been retained on the screen as metal? No; what we have been allowed to do is this—After forking we have been allowed to put 4 feet, approximately, of the forking to 4 feet of Nepean sand. The same thing applies to both the Rookwood and Parramatta contracts which I had.
11527. Do you remember what was done in the case of the Plattsburg contract? No; Mr. Curtis or the engineer could give you information on that point. I was only there as a visitor.
11528. The pebbles you are using at Parramatta you obtained from the Nepean River? Yes.
11529. They are pretty uniform in size? No; it is unscreened gravel.
11530. But you screen it? Yes.
11531. You eliminate all the sand? Yes; through a ½-screen.
11532. All that you retain on the screen is used as metal? Yes; the screen stands in the gauge-box, and the stuff is shot against it.
11533. Taking the pebble you get in that way, would there be less small stuff in it than you would get in the crushed sandstone used in concrete? There would be considerably more small stuff in the pebble. My experience is that in forked sandstone there is a very small proportion of small stuff.
11534. Are you speaking now of knapped sandstone or crushed sandstone? I am speaking of knapped sandstone; I never crushed any.
11535. As to Inspector Reid, on a former occasion you gave Reid a good character—just such a character as we should have given him; were you always satisfied with him—not that it was any part of your business to be satisfied or dissatisfied with him—as to the way in which he conducted himself in relation to your men. Do you remember what took place at Coogee? I know that Inspector Reid at Coogee was dissatisfied with the crown of the arch. He did not say anything to me about it, but I happened to be out there one morning. It seemed that Mr. Reid had put himself into communication with Mr. Milner, and asked him to come out as he wanted the top of the sewer finished with a smooth face.
11536. And did you express satisfaction or dissatisfaction with Inspector Reid's conduct towards yourself and your men? I had nothing to say as to that. I told Mr. Milner that I thought that if Reid were dissatisfied with the crown of the arch, seeing that I was there at the time, he should have told me of his grievance before going to him.
11537. Did you say that if the job was going to last for any length of time, then, as Inspector Reid was so impracticable in his ideas, and so unreasonable upon certain little unessential points, you would have to make a request for another inspector to be put on the ground? No.
11538. Did you say nothing to that effect? I say this—that Reid is one of the most particular men I have worked under. He is a man who has the specification in one hand and the rule in the other. He is continually measuring. He is what you would call a finnickier man.
11539. He is an awkward man sometimes on a large work? Yes. He is a man who likes things to be tip-top. There is no doubt about that. If a man happened to be on a job beforehand where things went fairly smoothly, and where the inspector was satisfied with a fair thing, he might think that Reid was unnecessarily harsh.

11540. Suppose that after you had rendered the invert of the sewer Reid had asked you to put your men on their hands and knees with coarse sandstone to scour the invert to make it smooth, would you call that reasonable? I should not do it; I should appeal to you; I was not asked to do that. As long as the inspector does not put you outside of the specification there is no room for complaint. Some inspectors of course are better than others. Some are more practical men. W. Gilliver.  
7 Aug., 1896.

11541. Do you know how many casks of cement were used upon the Coogee job? No. There was some borrowing and lending of cement in connection with that work; I know that we had some transactions of that kind with Phillips and Rhodes.

11542. I believe contractors are in the habit of obliging one another, and that cement is passed backwards and forwards in this way with the result that the contractors sometimes get a little bewildered as to the quantity used? Yes; there is frequently a borrowing of cement.

11543. *Mr. Carter.*] Did you ever make up gaugings of the various concretes 5, 2, and 1, 7, 3, and 2, and so on, to ascertain what they came to? I have not in the case of special bluestone concrete.

11544. I am referring now to ordinary sandstone concrete? I am doing that every day.

11545. What has been the results? I gave the results the last time I gave evidence. The  $1\frac{1}{2}$ -inch bluestone came to  $19\frac{1}{2}$  feet, and the sandstone came to  $23\frac{1}{2}$  feet.

11546. As to broken brick, have you ever made any gauging of concrete made with broken brick? Yes.

11547. Do you consider broken brick a good substitute for sandstone? Yes; I have seen it used repeatedly.

11548. It has been stated in evidence that it is the usual practice on big contracts to allow only 10 per cent. for plant, supervision, and profit? As to that, if I had a plant suitable for a particular contract I could very likely cut under another contractor who had to go into the market and buy his plant.

11549. Would you think 10 per cent. a fair thing to put down to profit, supervision, and all that sort of thing, taking Contract 69 as an instance? I do not think it would be enough. I should put a percentage on to the work for plant in taking out my estimate, undoubtedly.

John Carter recalled and further examined:—

11550. *Mr. Parkes.*] Where did you get the sand for Contract 77? At North Shore. J. Carter.

11551. It is crushed sandstone? Yes. 7 Aug., 1896.

11552. Is McMillan supplying you with sand for Contract 77? No; for Contract 118.

11553. Did he cart any sand to Contract 77? Not in connection with the arches. I may have used a little of his sand in the piers.

11554. Do you use any of the sand from the stone which you have taken out of the tunnel? Not upon Contract 77.

11555. Have you crushed any of the stone taken from the tunnel for sand? Yes, I believe so; a little.

11556. Who are carting the sand from North Shore to your contract? Webb and Booth.

11557. Anyone else? No.

11558. How much have they carted? I could not say. Possibly about 2,000 yards. I can easily get the information. You will see their carts going up the street every morning if you look out of the window.

John Young recalled and further examined:—

11559. I suppose there is no more experienced builder in Australia than yourself? No, if age and experience has anything to do with it. I suppose I am about the oldest; I have been at it for 50 years. J. Young.  
7 Aug., 1896.

11560. What contracts have you carried out? All sorts.

11561. Have you ever tendered for the Victorian Government? Yes.

11562. For the New South Wales Government? Yes.

11563. For the Queensland Government? Yes.

11564. For the South Australian Government? No; but I have tendered for the Governments of Tasmania and New Zealand.

11565. Were you not at one time President of the Contractors' Association? Yes; I was President of the Public Works Contractors' Association here for some seven or eight years, and previous to that I was for seven years President of the Builders' and Contractors' Association.

11566. You have had a good deal of experience in tendering? Yes.

11567. In schedule forms as well as in lump sum? All sorts of tendering.

11568. You often tendered for the Department under the late Mr. John Bennett? Yes.

11569. And you have carried out contracts under his administration? Yes.

11570. Turning to the compiled list of tenders for Contract 69, will you read some of the items in the schedule of Messrs. Carter, Gummow, & Co.'s prices. You will notice that the first four items are put down at 9s.; then there follow a number of items at 27s. 6d., and so on? Yes; I notice that that is so. [*Vide Appendix No. 43.*]

11571. Are you familiar with the specification as to subducts? Yes; I have read it.

11572. What do you think of the price of 1d. per yard for subducts? It is ridiculous.

11573. You would feel inclined to say from the uniform prices appearing in Messrs. Carter, Gummow, & Co.'s tender that the quantities had not been worked out; that is evident on the face of it? May I express my opinion?

11574. Yes; I want your opinion. You say you tendered under the administration of the late Mr. John Bennett;—did you ever see anything of this kind occur under the late Mr. Bennett? No; nor anyone else.

11575. *His Honor.*] What can you, as a contractor, say would be the object of any contractor in tendering in that form? It is not for me to say what the object was, because I do not know what their views may be on such a subject. I know what it looks like. It seems to me to be uncommonly suspicious.

11576. What appears to you to be the probable object? There must be one of three things. From my judgment in such matters, I should say that the contractors must have had peculiar information of some character in reference to the contract.

11577. *Mr. Parkes.*] Where from? From those who know.

11578. Previous to tendering? Yes. Either that or there must have been recklessness and chicanery mixed. If neither of these things happened then the Department must be totally incompetent. There must have been one of those three things.

- J. Young. 11579. Would you expect a tender such as that to receive any consideration whatever if you sent it in? It should have been kicked out; and, what is more, I think it would be to the advantage of this country if the departmental work were done away with and the matter were left to private individuals, because they would never do a thing of this kind. I never in my life saw anything equal to it.
- 7 Aug., 1896. 11580. You will see the schedules of prices in connection with the other tenders; do you see anything of that kind in connection with those schedules? No; all of that is fair tendering.
11581. Take the item of bluestone pitchers at £50 a yard? Yes; that is another ridiculous price. £1 would be ample—more than enough.
11582. Suppose that after the contract were let the 12 yards of these bluestone cubes were increased to 38 yards, as disclosed by the final certificate, the quantity being paid at the rate of £50 a yard, what would you say to that? Well, it is giving them the difference between the price for the 12 yards and the price for 38 yards. The Department might be bound by the contract to give them the 12 yards, but to give them the balance is simply throwing away public money.
11583. Do you know of any parallel case? No.
11584. As a contractor you would expect only the ordinary price to be paid you for increased quantities? That is all I could expect. Of course, the quantity which I executed under the contract I should expect to be paid for at the rate specified; but I should say that the engineer who put in more than the particular quantity specified or agreed upon at this exorbitant rate deserves to be kicked out of the Service.
11585. Take item No. 8, heavy blasting—you would see that Carter, Gummow, & Co.'s price is 27s. 6d.; that John Ahearn's is 16s.; Kerle and Kerle's, 23s.; M'Kenzie's, 13s. 6d.; Holloway Brothers', 20s.; and Deane and Sons', 18s. Only three or four out of the whole eleven exceed Carter, Gummow, & Co.'s price. Does not that show how a tender fixed up in this form can in the long run defeat the Department. I may tell you that that particular item is increased in the actual work by something like 10,000 yards, or £11,000 on that one item;—what do you think of that—is not that a trap to rob the public? I certainly think that it is a trap.
11586. Ought not any officer to have seen that a schedule was arranged for that purpose? It looks strangely like it, but the main objection, I take it, is the receipt of such a tender. The heads of the Department ought to be censured most severely for receiving a tender of that character.
11587. Turn now to Contract 79, if you look at page 333 of the Parliamentary return you will see that it is divided into two parts,—one part is the final statement, and the other part is the final certificate. I want you to look at the first item in the first part, "excavation in tunnels, guttering and gadding;" you will see that it is put down at 63s.; the blasting with 4-in. powder is put down at 60s.; then when you get down further you will find guttering and gadding at 83s.; you will see that "excavation in shafts, road surfaces," is put down at 78s.; excavations in shafts, with 4-in. powder, is also put down at 78s.; if you look at the actual payments alongside of these items you will see that there are 800 yards of guttering and gadding reduced to 21 yards; you will see that the 4-in. powder excavation in hard rock is increased from 3,000 yards to 3,707 yards; you will notice also that the items "excavation in shafts, road surfaces, 75 yards, at 78s.," is increased to 541 yards; you will see also that the guttering and gadding at 83s. is done away with entirely; you will see that the 2-in. powder is done away with, and that the 4-in. powder at 78s. is increased from 2,500 yards to 3,267 yards;—what is your opinion of that form of tendering, and the subsequent readjustment? The contractors had a perfect right to the 75 yards at 78s., but when you increase that item to 541 yards you practically give the contractors £1,500 or £1,600. But there is a more serious thing than that. In the final certificate for this work, I see there has been an attempt to hide what has been done by mixing it up with other work, so as to blind, perhaps, the Engineer-in-Chief. [Vide Appendix No. 45.]
11588. In the certificate, which is a copy of that which would be sent to the Auditor-General, the effect of alterations in the details you have pointed out is not included? No.
11589. What is your opinion of that? I think there is an attempt to deceive, because if it were not so, why not put the precise sum of the description of work done in the final certificate.
11590. From your experience, as a contractor, can you say who gets the advantage of the altered schedule when such a thing is done. Supposing a schedule is readjusted in the fashion in which this schedule has been readjusted, does the Department or does the contractor get the advantage? The contractor is supposed to get the advantage.
11591. What do you think is the case in this instance? The contractor gets an immense benefit.
11592. I think public repute will allow that very few, if any, men in the Colony have had more to do with concrete structures than you have. Will you tell me some of the cases in which you have built concrete work? At the corner of Pitt and Park Streets I have built seven or eight shops almost exclusively of concrete. Then there is the work I did at the Post Office. I have done an immense quantity of concrete work. The cases are so numerous that it is difficult to mention them; I have done concrete work of every kind. I took a fancy to the work in this country even before the architects would use it. That would be 25 years ago, when the architects were very chary of using concrete. I then used it extensively and advocated its use as I do now—in its proper place.
11593. You have found it an awkward thing to deal with? Yes, it is not so easy as it looks. The first thing I may mention in connection with concrete concerns a matter as to which there appears to be some misunderstanding. Concrete never expands; it contracts, but it never expands. It continually contracts, and the more clay there is in it the more it contracts.
11594. By clay you mean loamy substance? Yes.
11595. As to contract 77, which Messrs. Carter, Gummow, & Co. are carrying out—Do you know of your own knowledge whether they are using crushed sandstone as sand? Yes, I have seen it.
11596. They are using sand from crushed sandstone? Yes, I have seen it. I know crushed sandstone by its texture. It is quite different from drift sand.
11597. You have seen it going into the work, have you not? Yes.
11598. As to the excavation taken out of the streets in your municipality, your council wanted the ballast if it were of no use to the contractors? Yes; they had some of it, I believe.
11599. The contractors said it would be of use to them? They said they wanted it.
11600. For what purpose? They did not say for what purpose.
11601. Your opinion of concrete in any great lengths is that it will crack, and keep on cracking? Yes; used in that way, undoubtedly it would crack. I think you will find that I am perfectly accurate in what I say as to this particular work. As far as I can understand it has already done so. I have not seen the work

- work myself, but I am quite prepared to believe that that is the case. After all, I do not need to look at it myself, because my experience tells me that it will crack. J. Young.
11602. You are referring now to Contract 77? Yes; both of those aqueducts you will find will crack. 7 Aug., 1896.
- We shall see by and by who is right and who is wrong.
11603. As to Nepean sand, do you not think that in a work of such importance it would have been better to use that sand? Yes. It would have stood a much better chance if that sand had been used.
11604. Will the iron assist the work? I think it will. No doubt iron is beneficial in concrete. There is something about iron and its use in theory which I have not found in practice. If iron contracts and expands, and if concrete or compo. contracts only, there must be a movement of the iron in the concrete, and that cannot be beneficial, because it destroys the bond. Still, although that is the case, it only proves one thing: it shows that concrete and iron is not the durable thing which brick or stone would be. It shows that there would be a movement in the structure, and that movement going on continually year after year must have an effect upon the material. That effect must be that the structure will not last so long.
11605. It is a common practice to build concrete roofs to houses? Yes; I have done so myself.
11606. But in all those buildings has it been the practice of the builder to keep the concrete mass in small quantities like chequers running between the girders? The more you have in one piece the better.
11607. Always allowing for the play of the iron? Yes.
11608. The reason being that iron requires more play than concrete;—is not that so? Yes; the iron has a different movement from concrete. The concrete shrinks, and shrinks continuously up to a given time—that is, until it is thoroughly dry. Then I admit it does not shrink. In the meantime the iron goes on expanding with the heat and contracting with the cold.
11609. Have you to put under the girders roller plates? Yes; that is done to allow for the expansion and contraction.
11610. The less iron put on the better? Yes.
11611. Did you ever hear of tenders being called for plans made by the Department, and of one contractor being allowed to substitute his own plan upon prices the details of which are not given? I do not see what is the good of the Department if you do that—that is, if you allow someone else to come in and practically supersede it.
11612. In your long practice have you ever been allowed to do such a thing? Certainly not.
11613. Have you looked over Mr. M'Creddie's quantities in the substituted Monier design for Contract 77? Yes.
11614. What do you think of them? I have made an estimate of the quantities given me, assuming them to be correct, which shows that there is a saving by the adoption of the Monier work in the aqueducts—that is, a saving in material—amounting to £3,361. [*Vide Appendix No. 46.*]
11615. That estimate is quite independent of Mr. M'Creddie's estimate? I know nothing about his estimate. That is my estimate.
11616. If his estimate is £4,000 it would be fairly close to yours? I think I have been a little liberal. I understand as well as possible what this class of work costs; I know exactly what it can be done for to a trifle.
11617. Have you ever ventured upon the use of a cement structure for the purpose of keeping out water? I have tried it over and over again, but I find that it will not do so.
11618. You have not succeeded? No; you have to asphalt, and then you can keep out water.
11619. What is considered to be a fair builder's profit? I think they should get 10 per cent.
11620. What would that include? Superintendence, among other things.
11621. Would it include plant? It might or might not. Of course a contractor may have a good deal of plant; and if he can utilise it he does not charge much for it.
11622. With reference to the labour upon the general scaffolding work and centering work, the putting together and forming is not supposed to be the highest class of labour? For centering you want good carpenters, or else they get out of square or are not straight. It is a rougher kind of carpentering than you would require for joiner's work. Although you do not want a joiner, you want a man who can work accurately.
11623. Did you ever know of an engineer in charge of a work for some other person, and being responsible for that work, taking as a surety any man having an interest in the contract? I should have thought he would have been precluded from doing so. I know that I have never given as a surety any man connected with my contracts. I have given some one totally outside.
11624. Have you heard from anyone whether the aqueducts at White's Creek and Johnstone's Creek, in time of rain, keep the water from going through? I have not seen them myself during rain, but persons have spoken to me about them. I remember some one saying to me, "What you said about the compo. and concrete in those arches, Mr. Young, is perfectly correct. I was there the other day, and saw water coming through." They say that that is happening already.
11625. Water is coming through, you say? Yes.
11626. *His Honor.*] You have not overhauled the work yourself? No.
11627. *Mr. Parkes.*] Coming back to the question of concrete, you will notice in the Monier structure a succession of mastic joints in the carrier, but there is a disconnection between that and other parts of the work. With one part of the work rigid, and with the other part moving, would there not be some danger? Of course there would be if one portion is rigid and the other is allowed to contract and expand.
11628. Do you think an 80-foot span would be safe for concrete without a crack? I do not think it is. I would not like to go 80 feet with an arch of that character.
11629. As to sand made from crushed sandstone, Professor Warren says that, according to his tests and analyses, there are only very small particles of clay in it? Whatever clay there may be in it, I know from long experience that it is unfit for concrete.
11630. You say that from your practical experience? Yes.
11631. You know all about the method of testing? I do not believe in these tests.
11632. Is there much reliance to be put in the tests? No; I being a practical man, other persons may think that I am prejudiced, but I am not. There are a good many things which are right in theory which do not come out right in practice.
11633. As to the tests with hydraulic pressure? I have seen these things done by Professor Warren, myself, but I do not believe in them.



- J. Young. 11634. A jerk of the handle by the man working the machine, and it is all up? Yes; there are atmospheric influences and a variety of things which come in to interfere with and upset these tests.
- 7 Aug., 1896. 11635. Can they be properly carried out? There is nothing like absolute practice—doing the thing itself. That is the best test.
11636. I believe the Pymont bottom-block stone is the best in the city? Yes, but even that shrinks.
11637. If top-surface stone stood a test under the hydraulic pressure method, better than bottom-block Pymont stone, what would you say as to the testing? I should feel inclined to smile.
11638. Practical experience as to such matters, after the material has been put in position, is the best test? Yes, I think so.
11639. Do you see any reason to alter the opinion which you have previously expressed as to the different classes of sand? None whatever.
11640. In the case of Contract 77, if there were a powerful shrinkage in the concrete, do you think the iron would stand the tension put upon it? I take it that the iron follows the curve of the arch, and if the arch gives, the iron goes down.
11641. *Mr. Davis.*] Supposing the calculation of the arch showed it to be stable, would that alter your opinion upon the question of stability? I should like to know how you make the calculation. The only calculation I would agree to would be one founded upon experience. No calculation in figures would have any effect upon my opinion.
11642. Suppose the calculation were based upon actual experience? Then I should want to know the material used, where it was used, and how it was used. Material varies in so many places. Calculations made in Europe and other places would have no application to work here.
11643. A great many of the opinions you have expressed this morning are based, I presume, upon your theory? Upon my experience.
11644. Your experience being that concrete does not expand, but merely contracts? Yes; that is my universal experience.
11645. Supposing you happen to be wrong, that would necessarily militate against the opinions you have expressed? Yes; if I am wrong.
11646. For instance, with respect to the oscillation of the iron in the concrete or compo.;—assuming, as you do, that the iron expands or contracts, and that the compo. or concrete only contracts or shrinks, you might be right; but there would be no oscillation supposing the concrete to expand and contract in the same ratio with the iron? You can suppose what you like; I am only telling you what has occurred in my own experience, which has been continuous year upon year. If it upsets your theories I cannot help it.
11647. You say that concrete does not keep out water? Certainly not.
11648. You know of your own knowledge that most of the reservoirs which have been built in this Colony are built of concrete? Yes.
11649. What would you say in the face of that? I should say that every one of them wept more or less. A drip-stone will hold water, but it will let it through, and so will concrete.
11650. There would be a certain amount of percolation, you think, through concrete? Yes.
11651. But beyond that it is all right? Yes; for certain purposes.
11652. Will you turn to your estimate;—you said that you made the difference between the cost of the Departmental design and the Monier design £3,361;—what is the amount of your estimate for the Monier structure?—£7,846.
11653. What does that include? It includes 1,533 cubic yards of material above the skewbacks, comprising 383 cubic yards of compo., 1,150 cubic yards of small bluestone concrete, and 37 tons of iron in the grill.
11654. How much have you put it down for? I have put it down at 56s. 6d. per cubic yard nett.
11655. Without any profit? Yes, without anything of that sort.
11656. What have you put down in the case of the Departmental design? I make a total of £11,207.
11657. You arrive at that conclusion from the estimate you have made? Yes; but I must tell you that the quantities were supplied to me.
11658. Assuming the quantities to be accepted by both parties, your estimate is £11,207? Yes.
11659. You have had very large experience in tendering for works; which would you say was for all practical purposes nearer the value of the work, an estimate that is made as you have made yours, or a tender which you receive from a good substantial man? The tender of a good substantial man, if he gives an honest tender, would be the best guide, that is if the quantities are correct.
11660. Your tender for this work, according to the quantities supplied, would be £11,207; supposing another tender came in for the same work for (say) £9,000, that would be less than your amount, and the other contractor's idea of the value of the work would be less than yours; but if the contractor were a good substantial man, and were able to carry out the work, would his tender not be for all practical purposes the value of the work itself? Yes, if the man were capable of carrying it out.
11661. Would it not be a more tangible valuation than a mere estimate? Then again, you have to bear in mind that persons make mistakes in tendering. A great many persons do that. I used to do that myself occasionally.
11662. Supposing that you were going to build a house, and that you did not want to build it yourself;—supposing you made an estimate that it would cost £10,000, and on inviting tenders in the open market you received one tender for £7,000 and another tender for £7,250,—you would say to yourself, “I must be mistaken; this man who has tendered at £7,000 is a good, substantial man; he is able to carry out the work”;—that being his idea of the value of the work, would it not be the value of the work for all practical purposes? If he were capable of carrying out the work, and gave the necessary sureties, it would be so.
11663. If you got another tender at £7,250, would you not feel inclined to say that the first man was not so far wrong after all? Possibly.
11664. Coming to Contract 77, you will find upon page 163 of the Parliamentary return a list of the tenders received in connection with that contract, and you will see that the lowest tender is that of Messrs. Carter, Gummow, & Co., at 28½ per cent. below schedule, and that the second lowest tender is that of J. M'Sweeney, at 25½ per cent. below schedule? Yes.
11665. Looking at these two tenders would you regard Messrs. Carter, Gummow, & Co. as ordinarily stable men? I believe they are.
11666. And what is your opinion of Mr. M'Sweeney? He is a very good man.
11667. Does he know what he is about? I think so.



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11668. What would you say in this case, seeing that there was a tender of 25½ per cent. below schedule from Mr. M'Sweeney and a tender of 28½ per cent. below schedule from Messrs. Carter, Gummow, & Co.? I should think it was a reasonable difference of opinion.

11669. You would say that tender No. 1 and tender No. 2 were, approximately, the value of the work? Yes, if they are good men.

11670. You have spoken about cracks in this concrete work;—do you think that the cracks that would be likely to occur would occur within three years after the structure was finished? Yes.

11671. So that, supposing you were going to carry out a structure similar to Contract 77—the structure contained in these aqueducts—and you got a stable man to give you a guarantee for three years, you would be satisfied? I have read the conditions. There is a guarantee of £12,000 and two sureties of £6,000 each, making a guarantee of £24,000 to cover a work costing £15,000. [Vide Appendix No. 24.]

11672. Concerning a portion of the work (say one-half of it), there could be no question—I mean the tunnel portion. There is only the superstructure concerning which there could be any question, and in connection with which the guarantee would be given. It has been stated in evidence that this portion of the work would cost £7,500—would you say that the £24,000 in addition to a fixed deposit of over £700 would be sufficient? I think the security is so great as to be absolutely ridiculous. Of course if you get out of a fair proportion, it might be to the interests of the parties to evade the conditions altogether, to get completely out of the thing, unless they have a tangible security in money.

11673. *His Honor.*] What you mean is that the excess of the cover makes you suspicious as to the *bona-fides* of the whole thing? Yes. A man who has nothing at all may give you £100,000 security, but what is the use of it.

11674. *Mr. Davis.*] Suppose the man is so thoroughly persuaded that his wares are good, that what he is going to give you is of first-class quality and will stand every test—that it does not matter to him what security he gives? All I can say is that I am very sorry for him.

11675. He might give heavy sureties to show his confidence in the work? I say, again, that I am very sorry for him.

11676. Will you turn to page 275 of the Parliamentary return—you will see there a schedule attached to Contract 79? Yes. [Vide Appendix No. 47.]

11677. Will you read the note at the head of it? Yes; it says that the quantities in the schedule are not guaranteed.

11678. Will you now read the heading of the column where the quantities are given;—what does that say? “Probable quantities.”

11679. Taking that heading in conjunction with that note, would you say that the quantities are expected to be increased, decreased, or otherwise? I think that that is the mischief of the whole thing. You give quantities in your schedule, and what I have been accustomed to understand from these quantities all through is that they should be as near the probable quantities of the work which has to be done as it is possible to get at them.

11680. That should be the object, you think? Yes; certainly not anything else.

11681. But you think that that is not the object in this case? When you find that they are multiplied three or four times over you cannot say that that is so.

11682. But what would you conclude from the heading of the column and the note combined? I should conclude that the quantities were not exact to a foot or two, but they ought not to vary more than 5 per cent.

11683. You have had experience in the building of tunnels for sewers? Yes.

11684. From your experience is it possible to say, even to 5 per cent., what the nature of the ground in the tunnel is likely to be before it is driven? You can tell the quantities in the tunnel before it is driven.

11685. But can you tell the nature of the ground? Of course not; I am speaking of the quantities, not the material itself.

11686. Confine yourself to the quantities then. Suppose the ground turns out to be soft, and that when the quantities were put into the schedule it was expected that the ground would be hard? It could be tested so that you would know the ground. You ought to know what the ground is.

11687. Would you say that the same thickness of lining would be required in soft ground as in rock such as you will find in bottom block Pymont stone? That is a matter for calculation.

11688. Supposing you were wanted to put in a thicker lining, the ground being not what it was anticipated it would be, would you expect to be paid for it? Certainly.

11689. And if you did any extra excavation consequent upon the ground not being what it was expected to be, would you expect to be paid for it? Yes. I do not see anything in that.

11690. Supposing you found that the final vouchers of the quantities of a tunnel job did not correspond with the probable quantities given in the schedule before the job was let, would you be surprised? I should not be surprised at an allowance being made for it. Of course something unexpected will sometimes happen.

11691. Take item No. 4 upon page 333 of the Parliamentary return, “Excavation in shafts—road surfaces”? You must allow me to say this in regard to that item—you have 75 cubic yards. I presume there would be no difficulty in ascertaining what the road surface consisted of, or how much of that work there would be to do. There is no underground business about that. If you cannot measure that you cannot measure anything.

11692. Will you turn to page 275;—you will see there the schedule of quantities and prices for Contract No. 77; you will see that not only road surfaces but other elements are included in the item of excavation No. 4; It says, “Excavation in road surfaces, sand, soil, clay, pipe-clay, shale and soft rock only”? I take it that it means road surface in any of those materials. The item is only for surface, that is what it means.

11693. But would you think that it should vary at all? Not to the extent that you have put down here. I hold a very strong opinion about this method of calling for tenders. It is calculated to do an immense deal of injury.

11694. You do not see any reason why the quantity should vary at all? If you cannot tell what is on the surface you certainly cannot tell what is underneath.

11695. Supposing the work extends some distance below the surface—suppose you get shale 20 feet under the surface where you expected hard rock, would that not cause the probable quantities to be increased

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- J. Young. on that item? I presume you bored before you made your plans, and found out what the substrata were. You therefore knew exactly what you were going to do.
7. Aug., 1896. 11696. Suppose the boring is at every shaft? Even if you bore at every shaft you know before you make your specification what the ground is.
11697. Suppose, after the bores are taken, that they do not give an exact criterion? Then, of course, there would be a little difference; but it should not be very great.
11698. You know that bores do not always come out exactly right? Not exactly; but they are very near.
11699. Will you turn again to page 333, and tell us a little more fully why you expressed such a strong judgment about the variation between the final statement and the final certificate? I find here that in the quantities given upon which the contractors are to tender, there are 75 yards of excavation in shafts—road surfaces. That is increased in the final certificate to 541 yards. That is an item which happens to be at a good price. That is one thing which makes me say so.
11700. Can you tell me of another? I only looked at the schedule yesterday. If you were to give me a few days, I dare say I could find out a great deal more. I think there is enough in what I have already discovered to condemn the practice, in my estimation.
- 11700½. Suppose it is shown that when a contract is let for sewerage and other purposes the schedule containing all these quantities which you see there is sent to the Treasury and to the Auditor-General, and that from those quantities the vouchers sent in are checked by the officers of both the Treasury and the Auditor-General's Department, would that alter your opinion that there has been a design in leaving the quantities out in the case of the final certificate? Nothing would make me think that it is right, because I can see that it is wrong.
11701. Who did you think had been deceived by the final certificate? I think it is very probable that the Engineer-in-Chief was deceived.
11702. Supposing that the final certificate is always put before the Engineer-in-Chief, and that, moreover, the final statement is prepared for his information, and for no one else's, at the time he passes the final voucher, will you say that he has been deceived? I should censure him and others for doing it at all, because the thing is made out wrong, as you can see.
11703. But would he be deceived? In this case.
11704. But suppose he had the final statement before him? Of course, if he took the trouble to compare them and found that they did not correspond that would not be so.
11705. He would not then be deceived? No.
11706. Who else would be deceived? I think the practice of calling for tenders in this way is altogether wrong. I do not think such things ought to be received as tenders; they are not tenders. This tender of Carter, Gummow, and Co., for Contract 77, is not a tender in the proper sense of the word. This method of calling for tenders is calculated to do one of two things. In the first place, the contractor is entirely in the power of the Engineer. On the one hand he can ruin him if he likes, and on the other hand, he can make his fortune.
11707. Have you ever put in a tender yourself where only quantities have been supplied? I take it that if quantities are supplied they should be as nearly as possible correct as far as the work which has to be done is concerned. As regards the tenders, certainly a lot of things ought not to go in at a penny which cost about £1.
11708. You are speaking now of prices; but have you tendered where only probable quantities were given in the schedule, and where you supplied your own prices? If they were only probable quantities I would take them out myself. If a contractor has time to take out his own quantities, and to compare them with the quantities supplied by the Department, and if he finds that the Department has made a blunder, he can take advantage of it, and he deserves to get the benefit of it.
11709. Do you remember when you tendered for the Cook's River syphon? No.
11710. Was it not the same kind of tender as that in Contract No. 79? No.
11711. Was there not the same note at the head of the schedule? There might have been.
11712. Had it not the same heading at the top of the column of quantities? It is a good while ago.
11713. But it may have had? Yes.
11714. It may have been precisely the same kind of schedule? I do not believe it was. I would never have tendered upon such lines as these.
11715. Turn now to the schedule of Contract 69—you will see that the prices of Messrs. Carter, Gummow, & Co. are contained in the second column;—do they not fairly represent the value of the work? I do not think that is a proper tender at all. The prices are just what they ought not to be.
11716. Take the item of filling in at the sides of the sewers, item No. 20;—what would you say is the ordinary value of that work? 1s.
11717. What is Messrs. Carter, Gummow, & Co.'s price for it? 6d.
11718. What is John Ahearn's price? 1s.
11719. What is Kerle and Kerle's price? 2s.
11720. That 2s. would be twice as much as the work is worth in your opinion? Yes; but mine is a genuine opinion.
11721. Take item No. 21, the timber and iron in excavation;—what is the value of the timber used in the trenches, waling, struts, polling boards, and so on? I should say it would be worth from 3s. to 4s. a cubic foot.
11722. That would be a fair charge to make for timber in the trenches? Yes.
11723. What sort of timber is it? Oregon.
11724. What is the size of it? It goes various sizes. There would be other work in connection with it, which I should include in my price. For instance, there is the form in which the timber would have to go in.
11725. Take an ordinary sewer trench;—what would be the value of the timber in that case? Taking the price of the timber, the cartage, and the putting of it in place, I should say that it would be worth 3s.
11726. No ironwork is included in that? There might be a few bits of iron to keep it in place.
11727. A few spikes? The timber for the struts would be round timber cut into proper lengths. What would the waling be? 3 x 9.
11728. And the polling boards? 2½.
11729. That would be hardwood? Yes; it would not be worth quite as much as Oregon.
11730. Taking it all round, it would be worth 3s. a cubic foot in position, including labour? Yes.
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11731. What is Messrs. Carter, Gummow, & Co.'s price for that? 1d.
11732. What is John Ahearne's price? 2s.
11733. And Kerle and Kerle's? 1d.
11734. Kerle and Kerle appear to have given the same price as Carter, Gummow, & Co.? Yes.
11735. What is Mackenzie's price? 2s. 6d.
11736. And Mr. M'Sweeney's? 3d.
11737. What is Holloway Bros.' price? 5s.
11738. What is Carson's price? 2s. 6d.
11739. What is Dean's price? 6s.
11740. What is Langtry and Owen's? 1s.
11741. What is Parry and Farlrey's? 1s.
11742. What is Stewart & Co.'s? 1d. Owing to the uncertainty of what is meant by the specification I am not at all surprised at these different prices.
11743. The specification explains what is meant, does it not? Does it;—that is the question! I can understand these differences in price with that kind of specification.
11744. Clause 115, which appears upon page 96 of the Parliamentary paper, says:—"As the works proceed, all shoring, timbering, staging, temporary bridges, piling, sheet-piling, &c., shall be withdrawn, excepting all permanent timbering, planking, and piling below abutments, piers of aqueduct, storm-water channels, buildings, sewers, &c., as shown on drawings, where ordered under other works, and in all other cases where, in the opinion of the Engineer, the withdrawing of the same is impracticable, or would endanger the safety of the works, buildings, streets, and other surfaces over and adjacent to the works, when the contractor must obtain an order in writing, signed by the Engineer, to the effect that piling, sheet-piling, shoring, timbering, &c., may be covered up?" I think a man might make almost anything of that. There is nothing in that that you can put down a price for. There is no definiteness about it at all. It is the most indefinite thing of the kind I ever heard of. It is of no use to call that a specification. It might mean almost anything under the sun. A contractor reading that specification, when putting down his prices, would say, "What the devil does it mean? I suppose I must put down something."
11745. Coming to subducts, you know the clause in the specification dealing with them;—what would you say would be the value of the work per lineal yard,—take item No 25, the 9-inch internal diameter subducts? There are two or three kinds of subducts. I should say they would vary from 5s. to 10s. [*Vide Appendix No. 44.*]
11746. What do you include in that price? The cutting for the pipes, and so on.
11747. Suppose the schedule for excavations includes all the excavation in connection with the subducts, and that that excavation is not included in the items from 23 to 27,—what would you say is the value of the remaining work—suppose that all that remains to be paid for is the provision of and laying of the earthenware pipes;—what would be the price? It would vary.
11748. Take the 9-inch pipes? They would be 12s.
11749. Per lineal yard? Yes, the prices would vary from 5s. to 12s.
11750. What is the value of a 9-inch pipe? 18d. a length of 2 feet.
11751. That would be 2s. 3d. for 3 feet? Yes.
11752. Suppose you had not to include the cutting of the tunnel, and that that were included in some other item? If that is so why put it in here.
11753. But is it there? How do I know what your quantities really are.
11754. If it has been stated in evidence that the tunnelling is not included in this item, but is included in another item, what would you say? Of course, I cannot contradict you.
11755. Take items 24 and 25, subducts as specified in clause 8 in more or less hard material, including dry and cement jointing stoneware pipes—that is clear enough? Yes.
11756. What would be the value of a 9-inch pipe per lineal yard, including dry or cement joints? I should want to look carefully into that question. As far as I can understand, the price would be 4s. 6d.
11757. John Ahearne's price for item No. 25 is 8s., and Kerle and Kerle's 5s.? Yes.
11758. And you will see upon page 67 of the Parliamentary return that the total of the office estimate is £64,420 6s. 5d.? Yes.
11759. If, when the work was finished, the office estimate of the quantities actually executed corresponded favourably with the quantities worked out at Carter, Gummow, & Co.'s rates, you will say, I suppose, that there was not so much in it after all? I do not know what I should say. I should want to know all about it before I said anything.
11760. But you see that the prices in all these tenders are higgledy-piggledy? Yes, they are indeed.
11761. You carried out some work for the Government years ago in connection with the fortifications? Yes.
11762. Where were your works? At Middle Head, Steel Point, and Bradley's Head.
11763. Was the work considered satisfactory? Yes, perfectly.
11764. Have you ever heard that Colonel De Wolski discovered defective work there? Not in my work. You are mixing things up. That discovery was made in connection with Macleod's contract.
11765. I am referring to your contract? It is the first time I have ever heard of it.
11766. Have you never heard of Captain Phillips having to repair any of it? Never; nor do I believe it is so. There has never been a breath of such a thing, and I am sure you could not prove it.
11767. Did nothing of that kind occur at George's Head? I did not touch that. That was Macleod's work. You are mixing things up. You could not say a word against my work at Steel Point, at Bradley's Head, or at Middle Head.
11768. *Mr. Parkes.*] That was a case of putting in more stone than cement in proportion? Whoever made the specification in that case did not know how to make it.
11769. *Mr. Carter.*] Have you been contracting lately? Yes.
11770. How long is it since you had your last public work contract? About ten years.
11771. You said you considered Carter, Gummow, & Co. had shown in connection with one of their tenders a great amount of recklessness and chicanery mixed? I still say so. I think it is a reckless tender.
11772. But you used the word chicanery? What I intended to say was that it was reckless, and that it opened the door to fraud, collusion, and chicanery.
11773. But you said distinctly that the tender showed chicanery? I do not think I said so. What I intended to say, anyway, was that it opened the door to that sort of thing. 11774.

- J. Young. 11774. After seeing that other contractors' prices are in and out to the extent that they are, are you still of that opinion? Yes.
- 7 Aug., 1896. 11775. You would say, then, that your remark applies to all the tenders for that particular contract? No.
11776. But the prices are all in and out? I do not blame the contractors; I blame the officers.
11777. Considering that there is only 3 per cent. difference between McSweeney's and Carter, Gummow, & Co.'s tender for Contract 77, would you consider that there was reckless tendering? I think it is reckless tendering on the whole prices. I think if a man prices a thing he should do so according to its value. He should not put upon one item ten times the price, and make it up upon another item. There are cases where the amount is ten times the amount of the Department's price, and in other cases the price is thirty or forty times less. I call that reckless tendering. Perhaps I am using the wrong word.
11778. Have you in tendering often put in prices in this way? Never intentionally.
11779. You always charged the highest value for everything? No, but I got as much as I could get. Sometimes I have made mistakes. At times I have got a tender by making a mistake.
11780. Did it pay you? No, it did not.
11781. Did you ever see any test made in connection with the Monier plates? No; you invited me to one, but I did not go.
11782. Have you seen the test arches? Yes.
11783. Is there any sign of crack in them at the present time? I have seen none.
11784. They have been standing there eighteen months and you say that there is no sign of a crack? I do not know anything about the time they have been standing there. I shall look at the arches in due time when I think the cracks are likely to take place.
11785. Respecting the building at the corner of Pitt and Park Streets,—does the concrete work there show any signs of cracking badly? They would not hold water.
11786. Are they what you would call bad cracks? There are cracks, certainly.
11787. Concerning profit—do you think 10 per cent. is sufficient to allow over the exact cost of a contract upon which you have to supply plant and supervision, and take the risk of the market rates, and other things of that kind? Fifteen per cent. would be better.
11788. Do you think 10 per cent. is enough? I do not think it is; but we have to put up with it sometimes.
11789. In making a calculation in connection with the Monier work, and the exact cost of the material and labour, would it not be a fair thing for the contractor to add to that exact cost a certain amount for supervision and plant? Certainly.
11790. *His Honor.*] Have you ever had anything to do with the making of three to one compo. as distinguished from concrete? I have made it hundreds of times in a similar manner to this, with this exception—that I have not used crushed sandstone.
11791. I mean have you made it to use in bulk apart from rendering? Yes.
11792. Have you associated it with iron? Yes; I have used it with iron hooping interlaced. It makes a good structure. The iron is flat, of course.
11793. You have not seen any of the work going on in these arches? Yes; I pass them every day.
11794. But you have not been on the work when one of these arches was being turned? No; but I have seen them doing it. I know how they do it; because I pass close to it.
11795. You have not been able to compare the state of dryness or moisture in which the compo. is put into the work with the work which you have done? No; I have not compared it, but I see that they use it in a state in which they can shovel it down into the arch, and it must be tolerably liquid to admit of that.
11796. When you have used it, in what state has it been when it has been put into the work before ramming? Not too wet. You could not ram it if it were very wet.
11797. Comparing it with ordinary mortar, in what state would it be? Not so wet as that.
11798. Would it be so dry that you might almost call it a damp powder? Pretty nearly, or you could not ram it closely.
11799. You are aware, I suppose, that the compo. is rammed? I have seen them ramming it, and I knew that it could not be in a very wet state, or it would be all over the place. They would not be able to ram it.
11800. *Mr. Parkes.*] The main point in the schedule to Contract 67, in the tender sent in by Messrs. Carter, Gummow, & Co., is that a number of items, totally different, all in connection with various kinds of excavation, are put down at 27s. 6d. The point is this—could a contractor put down these uniform prices unless he knew beforehand the exact one which was going to be selected? That is what makes it look so bad.
11801. Unless he knew that he was going to be paid upon the special items upon which he has been paid, could he have put down these uniform prices? No.
11802. That shows there can have been no competition, and that some understanding must have been arrived at beforehand? Yes.
11803. The tender all through is alike? Yes.
11804. It is quite dissimilar from the other tenders? Yes. There is an attempt at valuation in the other cases.
11805. If the contractor who was the lowest tenderer had the right beforehand to substitute a plan of his own on a lump-sum tender would you consider that it would be right for the Department to accept that lump-sum tender without knowing if they were getting proper value or not? Certainly not.
11806. In subterranean structures where they use timber as scantling for support one contractor will often have old material which he can use, while another contractor will have to buy it? Yes.
11807. The timber used is often old round stuff that you would scarcely burn, so that in these circumstances the price might be 1d. or 3s.? Yes.
11808. The specification, so far as you can see, says nothing about the timber which is put under ground being of a particular kind;—there is nothing to guide you as to whether the timber may be old timber or not? No.
11809. You have made the estimate you have handed in in detail? Yes. Each item is given as I have worked it out.
11810. Will you furnish the Commission with the details, so that they may be printed as an appendix to your evidence? Yes.

Thomas Williams sworn and examined :—

T.  
Williams.

7 Aug., 1896.

11811. *Mr. Parkes.*] What is your occupation? I am a contractor.
11812. Have you executed any sewerage contract? Yes.
11813. Have you carried out any sandstone concrete? I have done a little of it.
11814. Had you to fork the ballast? Yes.
11815. You were one of the contractors who tendered for Contract 77? Yes.
11816. Did you know when you were tendering that another contractor was going to send in a lump-sum tender, with a plan of his own? Yes.
11817. And yet you sent in your tender? Yes; I happened to meet one of the partners in the firm of Carter, Gummow, & Co.—I mean Mr. Snodgrass—some five or six days before my tender went in. He asked me whether I was going to tender, and I said “yes.” He said, “It is not of much use your tendering, because we are going to tender so low that we shall get the work, on the Monier system.”
11818. That is one of the things which induced you to come to me with other contractors to make a complaint? Yes.
11819. Did Mr. Snodgrass say anything further to you? He said it would not be worth my while to bother about tendering.
11820. You had not put in your tender then? No.
11821. *His Honor.*] You had made out your tender? I had made it out at 16½ per cent. below schedule rates, but when Mr. Snodgrass told me what I have just mentioned I put it in at 6½ per cent. I knew that it was no use tendering with any expectation of getting the job.
11822. *Mr. Parkes.*] Did Mr. Snodgrass say anything further to you about his own tender upon the departmental plan? No; not that I recollect.
11823. Did he say words to this effect: that the firm would not take up their tender if the Monier system were not accepted? Yes; he said that if they were called upon to take up their tender upon the departmental design they could not do so. Mr. Gummow also told me so later on—some two or three months after their taking up the job.
11824. What did he say? The conversation came up in this way: I was driving with Scrutton & Co.’s traveller. It was one day at the crusher near Nelson-street. He said, “McSweeney is saying that Carter, Gummow, & Co. do not know their business.” We were referring to this particular job, and he said, “He might have thought us mad to tender so low, but we should not have taken it up at that price if we had been called upon to do so.” He was referring to their tender, 28½ per cent. below schedule.
11825. Did Mr. Snodgrass say anything to you at any time about a promise that they should get the job upon the Monier plan? Yes; he said his partners had had an interview with the Minister, and he had promised them this—that providing they were the lowest tenderers he would consider their proposal for the work on the Monier system.
11826. Did he say anything further? I do not remember anything further.
11827. If you had had a chance of tendering on the Monier system there was nothing to prevent you as a contractor from carrying out the work had you been the successful tenderer? I do not think so.
11828. Have you looked at the Government quantities? I am not an engineer, but I had a man to take them off for me.
11829. What would you say would be the value of the compo. work with the iron grill running through it on the Monier plan, making every allowance for such work as you would have to put into it? It all depends upon the gauging.
11830. As the quantities are 3 to 1 for compo. and 5, 3, and 2 of fine concrete, what would be the value including all the timbering, boxing, and centering? I should think from £2 to £2 5s. a cubic yard.
11831. That is inclusive of the ironwork? Yes.
11832. Have you looked into the details? No.
11833. Viewing the work as a whole, do you think, from your knowledge as a contractor, that it is a cheaper design in construction than the original departmental design on which you tendered? Yes.
11834. Did any member of the firm of Carter, Gummow, & Co. tell you that they expected to do well with it? No.
11835. You did not hear from them as to the value of the work they were putting into their substituted plan? Well, Mr. Snodgrass said they would make a lot of money out of it.
11836. What would be your feeling with regard to tendering with an office which acted in this way? From my experience I should not think I had any show with the Department.
11837. Have you tendered since? Once or twice.
11838. Would you feel sure that you would get the work if you were the lowest tenderer? I was the lowest tenderer some six or seven years ago, but I could not get the work.
11839. Why? In the first place they were going to give it to another tenderer whose tender was informal. When I kicked up a row about it, they called for fresh tenders. That was the Blackwattle Bay job—a storm-water sewer.
11840. They did not give the work to the next tenderer? They would have done so if I had not seen the Minister about it. It was pretty well arranged.
11841. You were the lowest tenderer? Yes; I made an error of £100 in one of my additions. The next man was lower than I was by rectifying that error, but his tender was actually informal. He was allowed to fill in several items to keep him below me.
11842. Who was the next tenderer? Mr. Wright.
11843. They thought it necessary to re-tender in that case? Yes. I went to see Mr. M’Lachlan and Mr. Barling, and I also had an interview with Mr. Bruce Smith, who had called for fresh tenders. They kept me waiting for six or eight weeks for the job—in fact I sent to England for the buckle-plates thinking that we had the contract. Mr. Bruce Smith said that if I were not the lowest tenderer he would see that the next tenderer took the buckle-plates off my hands.
11844. Do you know if Mr. M’Sweeney at that time had any ill-feeling towards Carter, Gummow, & Co? Not that I know of.
11845. Not in connection with Contract No. 112? Not that I know of.
11846. Did you ever hear M’Sweeney say that he desired to beat Carter, Gummow, & Co. in tendering? No.
11847. When you waited upon me on the occasion which has been referred to, you complained, did you not,

- T. Williams, F.  
7 Aug., 1896.
- not, of the way in which Carter, Gummow, & Co. were allowed to send in their tenders according to schedule? Yes.
11848. *His Honor.*] What was said about that? I never complained about their doing that. Of course every contractor can make up his schedule to suit himself.
11849. *Mr. Parkes.*] Was it not pointed out that Messrs. Carter & Co. were treated in a different manner from other contractors when they had favourable items in their schedules? Yes.
11850. *His Honor.*] What was said as to that? It was said that if the items worked out in their favour they were paid on those items and the items were increased in comparison with the quantities given in the schedule. It was said that their big prices were increased and that the quantities in the case of their small prices were decreased. I remember that the bluestone pitching upon Contract No. 69 was one item which was increased.
11851. What was said to me as to the treatment of other contractors in that respect? I do not quite remember.
11852. *Mr. Davis.*] Was any other item referred to when it was considered that Messrs. Carter, Gummow, & Co. had an undue advantage given to them as to Contract 69;—was any other item apart from the bluestone pitchers mentioned? No, I do not think so in connection with Contract 69.
11853. How many times did you see Mr. Parkes? It might be ten times, or it might be more.
11854. On the first occasion on which you saw him with whom did you go? With Mr. Maddison.
11855. And on the second occasion? There were five or six. Mr. Rhodes, Mr. Butcher, and Mr. Ewing were among the number.
11856. There was a regular deputation then? Yes. What we went chiefly about was the cutting of the drain for the storm-water in connection with the work at Johnstone's Creek. We estimated for that work in tendering. We allowed £300 or £400 for the cutting of that drain, and when we saw that Carter, Gummow, & Co. got it done for nothing we thought we had a right to complain.
11857. Did you ever do any work for me? No.
11858. Did I ever speak to you before? No.
11859. Did you ever do any work for Mr. Hickson? No.
11860. Did you ever speak to him? No.
11861. Have you done work for the Water and Sewerage Board? Yes.
11862. Principally pipe work? Yes.
11863. Did you ever have a job at the Glebe? Yes.
11864. Did that work out all right? Yes.
11865. You know something about the fixing up of schedules;—did you not practice your hand at it on the Glebe job? I might have had more knowledge of the district than the Department had.
11866. Did you make use of your knowledge? To a certain extent.
11867. To what extent? On some items I made a little money and on others I lost it.
11868. What was the price for the excavation in rock? Three shillings.
11869. What was it worth? It would be worth about 10s.
11870. What is the work worth in soft ground? About 3s.
11871. How much were you paid for it? Ten shillings.
11872. You were paid 3s. for rock and 10s. for muck? Yes.
11873. What was the amount of the contract according to tender? Something over £14,000.
11874. And through your fixing up your schedules what did it work out to? I think to between £16,000 and £17,000.
11875. There was £2,000 or £3,000 difference in the amount? Yes.
11876. Coming to the Pymont-Bridge-road work,—you said something about the second tenderer filling up items;—what did you mean? He told me so himself. I am referring to Mr. Wright, who used to be an inspector in the Department.
11877. Do you say that he was allowed by the Department to amend his tender after it had been put into the tender box? Six weeks afterwards.
11878. You are speaking from what he told you? Yes; I went and saw Mr. McLachlan, who said that something like that was going on. Then I went to Mr. Barling, and afterwards to Mr. Bruce Smith. Mr. Michael Chapman introduced me to Mr. Bruce Smith. They were both members for the Glebe at that time. As to the Glebe job to which you have referred—the Water and Sewerage Board do not bore to find out the kind of ground, whereas in your Department you do, and I made use of my local knowledge.
11879. *His Honor.*] In getting round the Water and Sewerage Board? Yes. They did not put down trial bores.
11880. *Mr. Davis.*] How do you make your price for the Monier work from £2 to £2 5s.? Take two casks of cement—that would be £1, and a yard of sand, say 3s.
11881. What kind of sand? The kind of sand you would get in the district from crushed sandstone.
11882. What is the balance made up of? Labour.
11883. And what have you allowed for labour? Four shillings and sixpence for mixing.
11884. And what for putting it into position? I have included the putting of it in position in that amount.
11885. That would be altogether £1 7s. 6d.;—how do you make out your £2 for the Monier structure? When Mr. Parkes asked me his question I understood him to mean the iron as well—the whole design in fact. I would allow 6s. for iron and 5s. for timber. I find I made a mistake as to water and labour—I should have said 6s. 6d.
11886. Is there anything else you have omitted? No.
11887. Do your prices include plant and profit? No, not profit.
11888. What would you say the profit should be? It all depends upon the quantities you are going to put in.
11889. I suppose it is as much as you can get? The more concrete and compo. the less profit per yard there would be.
11890. What would be the profit on this work per yard do you suppose? I should say 20 per cent.
11891. You say you have never had a chance of tendering for the sewerage branch? I suppose I have been too high.
11892. That then has been the real reason. You happen to have had an extravagant idea of the value of the work and your tender has been correspondingly high? I do not think I have been so very high. I was third lowest the other day.
- 11893.

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11893. You have seen Mr. Parkes frequently during the sittings of this Commission? I do not think I have seen him more than once in six or seven weeks since this Commission has been sitting.
11894. Do you know Mr. Milner, of the Sewerage Branch? Yes.
11895. You are pretty familiar with him? No; I have talked to him a few times.
11896. Have you seen him just lately? Yes.
11897. Since the Commission has been sitting? Yes; I met him in King-street one day.
11898. You had a conversation there? Yes.
11899. What was the substance of it? I do not remember it just now.
11900. Did you say anything about Mr. Hickson during that conversation? I cannot remember.
11901. Did you say anything about me during the conversation? No.
11902. I suppose I did not cross the horizon of your thoughts? I do not remember saying anything about you.
11903. You did not say anything about Mr. Hickson or myself? I cannot remember doing so just now.
11904. Did you say anything about Mr. Hickson and myself in conjunction with this inquiry? We were talking about this inquiry—about sandstone, concrete, and one thing and another. I said I did not think the way in which stone was taken from Johnstone's Creek and allowed to be used in the works there was fair when Pymont stone had been specified or stone equal to it.
11905. But did you mention in connection with this inquiry Mr. Hickson's name or mine? I might have done so.
11906. In what connection? I cannot remember.
11907. Have you any strong opinion as to Mr. Hickson's conduct in connection with the inquiry? No, I have not, and I do not see that I have any reason for it.
11908. Have you any strong opinion as to my conduct in the past? No; I have not had any business with you.
11909. Did you tell Mr. Milner the object which you and others had in moving Mr. Parkes? No.
11910. Are you quite sure of that? Yes.
11911. Will you swear that you did not? Yes.
11912. Will you positively swear that you did not mention my name or the name of Mr. Hickson in connection with this inquiry? I might have mentioned you, but not as you are alluding to it.
11913. In what way am I alluding to it? You think I was spiteful in doing so.
11914. I did not say so; I want to know in what way I was alluding to the matter? The only thing that I referred to was this—I think I said that if it were proved that these things were true you ought to be shifted.
11915. You said that you would not be content until Mr. Hickson and myself were moved out of the Department, and that that was the object of the whole thing? I never said that.
11916. Did you say anything tantamount to it? No.
11917. Had you any reason for saying such a thing? No. If Mr. Milner says I told him that, he says that which is not true.
11918. You will swear that you did not say it? Yes.
11919. Is not that what you had in view in moving in the matter? No; that was not my motive. What we wanted was to be put upon an equal footing with Carter, Gummow, & Co. at the tender box. That was my only motive.
11920. *Mr. Carter.*] Will you tell me who was present at the conversation which you say you had with Mr. Gummow near the stone-crusher? No person was present beside Mr. Marr and Mr. Snodgrass, who was standing about 50 yards away.
11921. You say that Mr. Gummow told you that we would not take the contract up at 28½ per cent. if called upon to do so? Yes.
11922. You are quite sure of that? Yes.
11923. You know that Mr. Gummow is not a very talkative man, I presume? Yes.
11924. You know also that Mr. Snodgrass and Mr. Gummow are looked upon in the light of authorities in sewerage matters, and the taking up of tenders; they have had a large experience and a good training; they have assisted you and other contractors, have they not, in making up tenders? Not me.
11925. Did not Mr. Snodgrass assist you? No.
11926. Have you never come to him for advice on the subject? No.
11927. Not in connection with the Blackwattle Bay contract? No; I think he is too slippery a man to ask for advice on such a matter.
11928. *Mr. Parkes.*] In connection with Contract 118, did you estimate for that work which was done for the unemployed? Yes.
11929. Do you know if the other contractors did so? I think so.
11930. Do you know it for certain? Yes.
11931. That others did so? Yes.
11932. And it was the unemployed who did that work? Yes, I think so.
11933. Did you see them? I saw that a question was asked in the House about it; I saw the report.
11934. The answer was that the unemployed did the work;—but it was supposed to be done by the contractors, was it not? Yes. We understood that we had to make provision to pump out the water.
11935. *Mr. Davis.*] In the list of tenderers in Contract 118 your name stands the seventh? Yes.
11936. Your tender was 9 per cent. below schedule? Yes.
11937. And the successful tenderer was 20½ per cent. below schedule? Yes.
11938. So that, even supposing what you say to be the case, you would not have been successful in getting the job? No; I do not think so.



MONDAY, 10 AUGUST, 1896.

Alexander Dean recalled and further examined:—

- A. Dean.  
10 Aug., 1896.
11939. *Mr. Parkes.*] You have read the specification as to subducts in connection with Contract 69? Yes.
11940. What work would you, as a contractor, think was included in that? Excavation and everything, I should say.
11941. With such a clause in the specification, the contractors, although tendering honestly, might vary very greatly? Yes; the prices might be higher or lower. One man may have a speedier way of doing the work than another.
11942. It is an uncertain thing what subducts are required? Yes.
11943. But you would take the specification to mean that some subducts would be required? Decidedly, or the clauses should not be there at all.
11944. So that, if you allowed in your tender £1,600 for these subducts, you did so thinking that you would have to put them in to facilitate the working of the contract? Whatever we saw in the specification we measured it up, ascertained exactly what it would cost, and put an amount in the schedule.
11945. But you think that with such a clause as that contractors might easily vary from £600 to £1,200 or £1,600? Yes. I see that our price was 20s.
11946. But the contractors would not put down a price ridiculously low for work of that kind if they thought they were going to do it? No; I cannot make it out at all. As I said before, the specification was laid before us. We read it carefully, measured up the work, and then put in our prices. I see the prices of the other contractors for this particular work all vary. The prices are irregular.
11947. Does that look like *bonâ fide* contracting or not? Yes.
11948. But what would you say with regard to the price of 1d. in Carter, Gummow, & Co.'s schedule—is that *bonâ fide*? It does not look very like it. I see the office rates are 4s., 5s., 6s., 7s., and 8s. Our price might show, perhaps, that we did not understand so well what was required; but the price given in our schedule is our own estimate. That is all I can say.
11949. As a contractor, would you dream of putting the price of 1d. in? Never.
11950. If you put in such a price would it have the appearance of your having an understanding that the work was not to go in? As I said last week, I am not up to these matters at all. I have no knowledge at all of the internal working of the office.
11951. Take the different items in Carter, Gummow, & Co.'s schedule at 27s. 6d.; you will see a whole series of them beginning with "excavation less hard" and ending with "excavation in hard rock (heavier blasting)"; the whole of those items are at 27s. 6d.; would it be possible for contractors to work out prices uniformly in that way, tendering *bonâ fide*? No; I do not think so.
11952. Is the plan of Contract 69 clearly marked with regard to the nature of the soil of the ground through which the sewer goes? The plan shows clay, iron band, and shale. I do not see any rock there at all.
11953. Therefore, it might be termed all more or less soft? Yes, with the exception of the iron band.
11954. Have you ever seen a schedule of prices such as that of Carter, Gummow, & Co. accompanying a plan such as that of Contract 69? It was so issued that we could understand it, I think, and we tendered according. I do not see anything the matter with the schedule.
11955. But would you not think that the schedule should follow the plan as to the nature of the ground? Certainly; the sections you have shown me on the plan show only clay and soft stuff, whereas the schedule makes provision for soft and hard rock, and so on.
11956. *His Honor.*] If you refer to the schedule which is printed upon page 26 of the Parliamentary return you will see that the probable quantities are given? Yes; but you will see the different classes of excavation enumerated there also—for instance, there is excavation in road surfaces, sand, soil, pipe-clay, shale, soft rock, 19,320 yards. The heading also says "excavations and open trenches in more or less hard materials."
11957. *Mr. Parkes.*] Does such a specification give a contractor who is in the know an advantage over other contractors? I do not quite know what you mean.
11958. Look at Carter, Gummow, & Co.'s schedule prices, and you will see that they have a uniform figure for all these items of excavation;—would a uniform figure be likely to come out if a proper valuation were made? No; it would be utterly impossible.
11959. I want you to turn to Contract 77; clause 164 says:—
164. In conjunction with the concrete surrounding sewer, where the latter is built upon arches and in embankments, the contractor to provide, fit, place in position, and wall-in with the concrete, longitudinally, in each corner at top and bottom of concrete lining,  $\frac{3}{8}$ -inch diameter bond-rods in 16-foot lengths. The ends to overlap 12 inches, and tied together with binding-wire, and, transversely,  $\frac{3}{8}$ -inch diameter bond-rods  $4\frac{1}{2}$  inches above soffit of sewer of such lengths as to fit between the outer brick lining, or as shall be directed, spaced 10 feet from centre to centre. The cost of providing, fitting, placing, and walling-in, said bond-rods to be included in the schedule price per cubic yard of concrete.
- Does not that clause provide for practically the same iron bonding which is contained in the substituted Monier plan? I do not know anything at all about that; I have no knowledge of it.
11960. You have not looked at the ironwork there? No.
11961. But you know that there is ironwork in the contract? Yes.
11962. Do you not know the description of ironwork? I have no knowledge of it whatever.
11963. Iron put in concrete in one form or another has the same effect of binding the material together—that is the object of it? Yes.
11964. Do you think the ironwork in the concrete would stop it from shrinking if it be inclined to shrink? I do not think so. Iron and concrete will not work together. If the concrete in itself will not stand, no amount of earthwork or iron will keep it together.
11965. In the Monier plan from underneath the invert to the top of the piers there is no mastic joint; at the top of every pier, however, there is a slit of about an inch or an inch and a half;—if there is to be any shrinkage would it be detrimental to the structure or otherwise to have one portion fixed and another portion movable? If the arches stand in position I do not care very much what you put upon the top of them.
11966. But would the one part of the work, being without mastic joints, have any effect upon the other? I think not; but I must confess that I am more in the building line. I am only speaking in this matter from my general experience. I have not actual experience of the working of that description of thing.
- 11967.

A. Dean.  
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11967. *Mr. Davis.*] It often happens, when tenders for building construction or engineering construction are invited, that the principals or their engineers ask you to take the risk of the ground which is to be excavated, and to give such a price as will cover any risk arising from the softness or hardness of the ground? Yes; I have built stores, for instance, where the foundations have been uncertain—where the foundation has been cut across with a line, and where we had to take the risk.

11968. Does it occur to you that the object of taking borings along a line of sewer—such borings as you have been looking at in connection with contract No. 69—would be to minimise, as far as possible, the risk which the contractor might have to take? Yes; of course, the more information the engineers can give to contractors the better.

11969. Do you not think that that is probably the reason why there are so many items to be found in the schedule? I do not think so.

11970. The open cutting work is different from tunnelling? Decidedly.

11971. So that you might have a variation there? Yes.

11972. And taking open cuttings by themselves, would it not be probable that in an open cutting such as you have seen in the section you have examined, there would be soft ground not requiring blasting and hard ground requiring blasting? Decidedly.

11973. Would not that be a very proper subdivision to make? The strata of the whole of the ground in the neighbourhood of Sydney are different. They change very much.

11974. Would you not be likely to find in an open cutting in the vicinity of, say, Marrickville, soft ground not requiring blasting and hard ground requiring blasting? Yes.

11975. So that the subdivision in the schedule would be a very proper subdivision to make? Yes; the bores put down give the contractors every information that they could possibly get.

11976. Your notice has been directed to the fact that Messrs. Carter, Gummow, & Co. had put in a uniform price in the case of each cutting—that is, 9d. a cubic yard for soft ground, and 9d. a cubic yard for rock? Yes.

11977. Would not the solution to that, both as regards open cuttings and also excavations for tunnels, be that Messrs. Carter, Gummow, & Co., instead of adopting the Department's idea of reducing the risk connected with work of that description, had thought it wise to take the risk of putting in a uniform price? No; I think not.

11978. Would it not occur to you that that might be the case? I should not imagine that anyone would think of doing such a thing. The usual practice is to take measurements, according to the nature of the ground, and I, for my part, would never think of guessing at a thing of that kind.

11979. But suppose that, rightly or wrongly, that has been done? I do not know how Messrs. Carter, Gummow, & Co. may have done it. All that I can say is, that I would not do such a thing myself.

11980. I do not think many persons would do so, but Messrs. Carter, Gummow, & Co. appear to have done so for some reason? Yes; at the same time I cannot account for it.

11981. As to the schedule disagreeing with the longitudinal sections, is it not a fact that the schedule attached to Contract 69 agrees with the longitudinal sections in every respect? It does not appear to do so. In the schedule of Contract 69, hard rock is mentioned; but there appears to be no hard rock shown upon the plan.

11982. First of all the schedule provides for excavation in open cutting and in tunnel, does it not? Yes.

11983. Do you see the words, "open cutting," occurring on the sections? Yes.

11984. And do you also see the word "tunnel"? Yes.

11985. Do you notice that "tunnel" is divided into two classes—tunnel in rock and "tunnels in more or less hard material"? Yes; I see that. It escaped my observation just now.

11986. Take the item "excavation in tunnels in more or less hard materials" for sewers, pipe sewers, subducts, &c.? Yes; I see that.

11987. Do you see that on the longitudinal section? Yes; the words, "more or less hard material," occur there.

11988. And does the schedule agree with the longitudinal section in that respect? Yes.

11989. Then, take the item, "excavation in tunnel in solid rock"? Yes; I see that also on the longitudinal sections. I did not see it at first. I only noticed "clay and iron band" before.

11990. You notice that there are a number of bores given in the longitudinal section, indicating the nature of the ground as far as possible at the position of those bores? Yes.

11991. You see that these bores in some instances are 5 or 6 chains apart, and in other cases they are closer? Yes.

11992. Do you not think that between these bores there is room for a variation of material such as you spoke of just now? I do not think so. It would not vary very much anyhow.

11993. Take, for instance, the bores on the Illawarra Road at 3 miles 24 chains, at 3 miles 30 chains;—do you not think there is sufficient distance between those bores to allow for a variation of the ground in the tunnelling? Look at the natural surface of the ground. I should not expect myself to find very much difference. The formation would lead me to suppose that there would not be much difference.

11994. But does not the ground in the neighbourhood of Sydney jump up and down in the most unaccountable way? Yes; in building I have found pockets of ironstone, and I have also found pipe-clay in the heart of rock, as it were.

11995. I suppose that those who have been actually engaged in the execution of this tunnel work would be likely to know whether the ground goes up and down? They would have more experience than I have in that matter. I have no experience in tunnelling.

11996. Does not shale differ very much? Yes; some is very close and some is open.

11997. And some is soft and some is hard? Yes.

11998. Coming now to your own prices for Contract 69, I would like you to say, in connection with item 21, "timber ordered to be left in the trenches as specified," whether you consider that your 6s. per cubic foot is a fair price? Yes; it would not have been there if we had not thought it a fair price. We went into these quantities upon our own knowledge, and nobody else's. We may be high, or we may be low, but that is our opinion.

11999. Take the 9-inch internal diameter subducts, item No. 25;—what do you say about that price? That is a fair price.

12000. Do you know what it includes? It includes the 9-inch pipes, I suppose. The office rate is only 6s. It would show that we tendered too high, I suppose.

12001.

- A. Dean. 12001. The schedule would show that Messrs. Carter, Gummow, & Co., in the case of that particular item, came absurdly low? Yes.
- 10 Aug., 1896. 12002. Then take your price for glazed stoneware pipes, 9-inch diameter, item 39? Yes; it is 5s. Your price is also 5s., singularly enough.
12003. How is it that there is such a difference between item 25 and item 39? I cannot tell.
12004. There is a marked difference in your prices, is there not? Yes.
12005. And apparently for the same work? Yes.
12006. *His Honor.*] Might it be that you take one item to include the excavation? I expect that is so. The subducts in hard rock would include the excavation.
12007. It is evident to you that you have included what was not specified, and, moreover, what was not included by the other contractors, looking at their prices? Yes.
12008. *Mr. Davis.*] Will you tell His Honor what you meant by your answer to Question 11,420 when you said that the amount would be £3,000 below Carter, Gummow, & Co. when the work was completed, and that you had not gone into the figures? My sons told me that they had gone into the matter. They told me that if they had taken the figures as Carter, Gummow, & Co. had done—that is, so many items at 9d., so many items at 4s., and so many items at 1d.—it would have brought down our estimate so much that we should have been £3,000 below Carter, Gummow, & Co.
12009. In other words, if you had tendered at Carter, Gummow, & Co.'s rates you would have been £3,000 less than they were? Yes.
12010. How can you explain that? I cannot say; my sons went into that matter.
12011. What you mean to say, in other words, is that if you had put in a different tender it would have come out differently? No; there is no meaning in that. What I mean is that if we had adopted the plan adopted by this firm our tender would have been much lower. I am giving you this information not from my own figures, but from what my sons have told me.
12012. *His Honor.*] That would be by lowering those items which look as if they were not intended to be carried out at all? Yes.
12013. *Mr. Davis.*] You said the other day that you did not like fatty sand? Yes.
12014. Had you in your mind the Bourke-street drift sand or crushed sandstone? Crushed sandstone.
12015. Have you used any? For mortar. It makes very fine mortar.
12016. Where did you get your crushed sandstone from? From the rock near the work.
12017. I suppose you would say that the sandstone of Sydney varies very much in character? Yes; of course some is much cleaner than others.
12018. Suppose you knew that tests had been made of crushed sandstone, and that in those tests, when compared with other tests made under precisely the same conditions with sand from the Nepean River, the crushed sandstone came out at the top, higher than the Nepean sand—would you say that that would prove that it was the better sand? I do not believe in those tests at all; I believe in actual work. I would rather have the tests of bricklayers or plasterers than all your scientific tests. I have no faith in them.
12019. I once heard of a man who said that he could tell the strength of cement by tasting it; do you believe in that? No. I do not wish to be taken as speaking disrespectfully of scientific tests. All I say is, that tests can be applied equally well in a practical way in connection with actual work.
12020. *His Honor.*] Do you not know that science after all is only practice put into a definite, clear, and regular, form? Exactly.
12021. *Mr. Davis.*] What you would be afraid of in connection with the crushed sandstone would be the shrinkage? Not only that, but the fatty nature of the sand kills the cement. It has a different effect upon the lime.
12022. Would you be afraid of the shrinkage? I should.
12023. When do you suppose that that would take place? I could not tell.
12024. It would take place in connection with the setting, or when? It might be a year or two before it would take place.
12025. Do you think that any shrinkage which would take place would occur within three years? I could not tell you. What I say is, that I would not use sandstone for cement, speaking from my own practice, because I know it to be of a fatty nature tending to kill the cement. In mortar it is a very good thing, because it enters the key very freely.
12026. Did you say that you agreed with Mr. McCreddie in his statement in connection with Contract 77? Yes. He sent me some prices and asked me if I thought them fair, and I said I did.
12027. What items did he send you? I really forget now.
12028. I am speaking of prices, not quantities? They were sent in to me, and I gave them to my son and asked him to compare them with our own rates. He did so, and said that the prices were very fair.
12029. You are not prepared to go into the details of those items? No.
12030. Perhaps your son will be able to do so? Yes.
12031. Have you been on to the work at Johnstone's Creek? No.
12032. *Mr. Carter.*] What did you understand by Mr. Parkes' question as to our being in the know? I said I could not tell.
12033. Suppose you took it to mean or to imply that Carter, Gummow, & Co. had had a large and varied experience in sewerage construction—do you not think as a contractor that they, with all their experience, extending over ten or twelve years, in nothing but sewerage works, would have an advantage over contractors like yourself who confine their operations almost exclusively to building construction? Decidedly; every man to his trade. With reference to the information afforded by the sections, and, speaking from a builder's point of view, what I mean to say is that if I were erecting a building under such conditions and were asked if I expected to find three or four different strata according to this plan, I should say that I did not, and that I expected to find nothing but one stratum all through the particular section to which I referred.
12034. But suppose these particular contractors, through their large experience, risked a little and plunged in their prices as it were? I should not like to do so.
12035. But your opinion would not govern the action of other persons? The opinion of a man who had had twenty or even fifty years experience might not deter another contractor from taking his quantities out at a guess.
12036. Suppose you call it taking a risk rather than guessing? I should not call it so.

12037. But that might be the case? I impute no motives; all I say is that I would not do such a thing. I do not believe in it. A. Dean.
12038. If a contractor's prices include only payments to him covering material and labour, do you not think that 10 per cent. is rather a low amount to put on for profit, supervision, plant, and everything else? I should be very glad to get it upon all my contracts, and I suppose I have carried out as many contracts as has any man living in this city. Brains and plant will enable one man to do a thing cheaper than it can be done by another man. One man may not have the ability, or having the ability he may not have the experience, and it may cost him more to carry out the work on that account. Of course, if a contractor happens to possess plant, it will enable him to tender for a job more cheaply than another contractor who perhaps has to buy the plant; or, if he has ability, he may be able to get work done more cheaply than it can be done by a man who has no brains. 10 Aug., 1896.
12039. *His Honor.*] Still you put in something, I suppose, for wear and tear of both plant and brains? Of course; but the possession of plant enables us to take a job more cheaply than we could take it for if we had to buy the plant.
12040. *Mr. Carter.*] Suppose the prices given to include the exact cost of labour and material, are we not supposed to get more than 10 per cent. in addition to that in cases where we have to find plant and supervision and take the risk? I should be quite satisfied with 10 per cent.

Benjamin Rhodes sworn and examined:—

12041. *Mr. Parkes.*] What is your calling? I am a contractor. B. Rhodes.
12042. Have you had much experience in contracting? Yes; I have had a great deal of experience in sewerage work—in fact, since I was 13 years of age. 10 Aug., 1896.
12043. What sewers have you built for the Government? We have constructed a great deal of work for the Water and Sewerage Board. We have undertaken contracts at Waverley, Woollahra, Redfern, and The Glebe.
12044. In connection with these sewerage contracts had you to fork the sandstone ballast? Yes; we had always to fork the sandstone. We had always to take the fine stuff out.
12045. Will you describe the method adopted by the Government inspectors and engineers in getting concrete made for these sewerage works? In the case of the Lewisham job—the first job we ever had under the sewerage construction (a storm-water sewer)—we had to fork the whole of the stone, and the fine stuff which came out of the stone we had to screen. For a while we were allowed to use a certain proportion of that with Nepean River sand.
12046. Sandstone in conjunction with Nepean River sand? Yes; but after some time we were stopped from doing that, although the sand was washed. We washed a lot of it, and one day Mr. Davis came on to the job and condemned the heap we had washed, and would not allow us to use any more crushed sandstone for that class of work. He said we must use nothing but Nepean River sand. We had a great deal of trouble over that matter, and were put about a good deal. I consider that we were dealt with rather unfairly, and I have kept a sample of the Nepean River sand which was condemned in connection with that work. It was condemned on account of its being rather fine. I thought it rather unfair that we should be allowed to use the crushed sandstone with the Nepean sand for some time, and that then the practice should have been suddenly stopped. There must have been something wrong about that.
12047. What I want to know is this—in the making of the concrete were you compelled to fork the sandstone? Yes.
12048. What portion were you allowed to use of the stone which was not forked? We used the forked portion and the residue we had to screen. We were allowed to use a certain proportion of that with the Nepean River sand.
12049. In the making of concrete have you ever tested the quantity of cement in the proportions of four two and one of bluestone concrete? Yes; bluestone concrete made with 1½-inch metal, and mixed in the proportion of four, two, and one, will give about 20 cubic feet for one cask.
12050. That is from your experience? Yes.
12051. And what will sandstone concrete in the proportions of five, two, and one, make? About 24 cubic feet.
12052. Have you ever used any of the seven, three, and two, concrete? No, I cannot say that I have.
12053. I suppose the Government inspectors are strict in seeing that you get a uniform proportion of cement through your work? Yes; they are very strict. From what I can hear we had two of the most strict inspectors in the Department sent on to our work directly we started. They were sent from a contract at North Shore—one of Carter, Gummow, & Co.'s contracts.
12054. Who were they? Reid and Harris.
12055. Did you ever have any conversation with either of them as to their coming to your work? No; not on that matter.
12056. What sort of man did you find Reid? He was a very strict man—very strict. A good man for the Department, no doubt. I consider that in that class of work there should always be a certain amount of give and take. Reid kept us strictly up to specification.
12057. Did he quarrel with your men? No; he was not a quarrelsome man. He was a very fair man in that respect.
12058. You tendered for Contract 77, did you not? Yes. I took a great deal of pains in going into that job. It was a job I should very much have liked to get, and I took extra trouble, going into the matter most minutely. I think it was only right that there should be absolutely fair fighting between contractors for a job of that kind. If the Department considered that a lump sum tender was necessary for a job of that description, then we, as well as the other contractors, had a right to put in a lump sum tender.
12059. Was there anything to preclude you from carrying out the work upon the Monier system? Nothing whatever.
12060. Did you expect that the Department would have called for tenders upon the Monier system if they wished it adopted? I thought there should have been a plan on the table for the work upon that system, so that we might have put in alternative tenders.

- B. Rhodes. 12061. Do you recollect the specification in Contract 77 sufficiently to say that it contained a clause providing for iron tie-rods in the concrete wired together? Yes; I do remember that. There were some tie-rods to be used in the sewer itself. There were no tie-bars or anything of that kind in the arch work.
- 10 Aug., 1896. 12062. But there were in the carrier? Yes.
12063. If any ordinary contractor could put that work in, could he not put in the Monier work? Certainly.
12064. Do you know of anything which would preclude an ordinary contractor from carrying out the Monier system? No; I do not.
12065. Have you, since this contract was let to Carter, Gummow, & Co., had a look into the quantities of the Monier plan and prices? I had a look at the quantities.
12066. And you have priced them? Yes; for instance, take the 3 to 1 compo. I consider that the material and labour of the 3 to 1 compo. would be worth £1 6s. 7d. per cubic yard. There would be two casks of cement at 9s. 6d.; 24 ft. of sand at 3s. 6d.; the labour in mixing and watering, 1s.; and the placing in position, 3s. 6d.; making a total of £1 6s. 7d. for the compo. Then the special 5, 3, and 2 concrete comes out as follows:—1 cask of cement, 9s. 6d.; 10 ft. of metal, at 11s. 6d. per yard, 4s. 4d.; 6 ft. of sand, at 3s. 6d., 9d.; or a total of 14s. 7d.—or say £1 7s. per yard. I allow for the labour in mixing 2s. 6d., and for the placing in position 3s. 6d., making a total of £1 13s. The ironwork would be worth about 6s. a cubic yard and the centering 3s., bringing the total up to 43s.
12067. If you were tendering is that the price you would submit? I should be perfectly willing to construct the work at that price.
12068. Would you be bound in a full value penal bond for the construction of the work at that price? Yes; certainly.
12069. You would have been willing to take the risk at that price? Yes.
12070. So that there would have been nothing at all to preclude you from tendering if you had had the opportunity? Nothing whatever.
12071. In the making of the concrete is it not a good thing to have the stone so proportioned as to allow of about an  $\frac{1}{8}$ th joint between different particles of the stone? Yes; it is a very good plan for binding purposes.
12072. What would be the effect of a joint as fine as a piece of paper? That would be rather too fine.
12073. Is flat stone a good thing for the making of concrete? No; I would rather have it rough; the rougher the better for the concrete.
12074. In what shape? Angular in shape would be best.
12075. In pretty uniform bulk? Yes.
12076. You were one of the contractors who waited upon me with some complaint? I was one of four who waited upon you one day. I went to see you simply on account of what seemed to me very unfair treatment. I thought we ought to be put on the same footing as other contractors, who, I thought, were getting an undue preference.
12077. Take Contract 79; was my attention called to the manner in which the substitution of blasting for guttering and gadding had been made;—was that one of the things pointed out to me? I do not recollect it.
12078. *His Honor.*] Do you remember the schedule being produced? No.
12079. *Mr. Parkes.*] Was any complaint made to me with regard to the letting of Contract 79A without tender? Yes; that was very much spoken of.
12080. Do you recollect my attention being drawn to a certain item in that schedule in connection with excavation work? No; I do not recollect that.
12081. The schedule was not produced; but do you not recollect the statement being made as to a certain item in the schedule? I do not recollect anything about that.
12082. *Mr. Davis.*] Who was with you on the occasion when you went to see Mr. Parkes? On the first occasion, Mr. Williams, Mr. Butcher, and Mr. Ewing.
12083. On how many days did you see Mr. Parkes? I saw him twice.
12084. On the second occasion who was there? Mr. Gilliver was with us then.
12085. Who else in addition? Mr. Williams, Mr. Ewing, and Mr. Maddison, if I remember rightly.
12086. What took place on the first occasion? I met Mr. Williams, and he spoke to me on the matter. We talked the thing over, and we thought it advisable to see Mr. Parkes in reference to the manner in which Carter, Gummow, & Co. got Contract 77. That was the principal reason of our going to him. I considered that we had a perfect right to put in a tender at a lump sum as well as had Carter, Gummow, & Co.
12087. Did Mr. Williams suggest that you should go and see Mr. Parkes? Yes; he and I talked the matter over, and we thought it advisable to see Mr. Parkes.
12088. Mr. Williams is acting as general organiser to you contractors? No.
12089. Have you seen Mr. Parkes more than twice? I have seen Mr. Parkes twice during the inquiry—that is two days on which I have been sent for. I saw him one day last week.
12090. What occurred on the second occasion, when you waited upon him as a deputation? Nothing in particular transpired. We talked over several matters in connection with contracts.
12091. But nothing in particular was said? No.
12092. Your grievance seems to have been that you were not allowed a fair show at the tender-box, as you think, in connection with the letting of Contract 77? Yes; I was very much dissatisfied with that.
12093. As far as the tendering for the departmental design is concerned, I suppose you have no reason to complain about that? No.
12094. What was your tender? Thirteen per cent. below schedule.
12095. How did you rank in the number? I suppose we ranked seventh or eighth on the list.
12096. So that you were quite out of it? Yes; certainly. At the same time, I thought when I was tendering for it that it was a most elaborate design. I thought, somehow, that it would never be carried out. It is a funny coincidence that I made that remark to my partner. I told him I thought the design would never be carried out.
12097. *His Honor.*] Why was that? I thought it rather an elaborate design for a sewer.
12098. Too ornamental do you mean? Rather too ornamental—too costly.
12099. *Mr. Davis.*] Did you think Messrs. Carter, Gummow, & Co.'s price was very high considering the class of work they had to do? No; I thought 28½ per cent. off was a very low price.

12100. Do you think Mr. McSweeney should know anything about work? He should do so; he has carried out a lot of it. B. Rhodes.
12101. In view of the fact that Mr. McSweeney is only 3 per cent. above Carter, Gummow, & Co.'s price, what would you say? 3 per cent. makes very little difference. 10 Aug., 1896.
12102. What do you think of your own tender? I should like to have got the job at that price.
12103. Assuming that the Monier structure, according to Carter, Gummow, & Co.'s tender, is of the same value as the departmental proposal, would you not have been proportionately higher in your tender for the Monier work;—is not that probable? No; I do not think so.
12104. You would have been specially low for the Monier design, you think, if you had had a chance to construct it? Yes.
12105. That accounts for your price of 43s. per cubic yard? Yes.
12106. You think that is a low price? No; I do not think it is a low price. It is a fair working price.
12107. Would it be at all on the same lines as your tender for the departmental design? Yes.
12108. About in proportion? Yes.
12109. As to the sandstone concrete, did you use crushed sandstone when you made concrete at Lewisham? Yes; and Nepean River sand.
12110. Was it not at your request that the forking was done? No; we were compelled to fork it.
12111. On account of what was that? The inspectors compelled us to fork the stone.
12112. Were they doing anything outside of the specification? I do not think they could have compelled us under the specification; but, of course, if we had objected to it we might have been compelled to screen it, which would have been more costly.
12113. In other words, it was cheaper to fork the stone than to screen it? It was a little cheaper. Of course, in this case, there was screening to some extent after the forking.
12114. It paid you to screen it to get sand for use on the contract? Yes. The fine stuff being much cheaper than Nepean River sand.
12115. The sandstone you have spoken of was broken on the ground in heaps? Yes.
12116. It was broken on clayey ground, was it not? Yes; on good hard ground, principally.
12117. After the sand had been broken, and when it was forked up into the gauge-box, there would be left behind a quantity of sand and small stuff, would there not? Yes.
12118. Would that small stuff not be mixed to some extent with material from the ground on which the stone had been broken? It would, certainly.
12119. Was not that the reason why its use was objected to? No.
12120. Are you in a position to say that? Yes. I am perfectly satisfied that that sand was equally as good as the sand that we are using at the present time.
12121. And are you in a position to say that the reason I have mentioned is the reason why the sand was condemned? It is a funny thing that after it had been washed, and after it had been in use for some time, it should have been condemned.
12122. But can you say that that was not the reason why it was condemned? I am perfectly satisfied that it was not condemned on that account.
12123. Have you carried out much bluestone concrete? A considerable extent of it, especially in man-holes.
12124. In small man-holes? Yes.
12125. What sort of stone have you used? One and a half inch metal.
12126. Where was it obtained from? Principally from Fuller & Co.
12127. Was it hand-broken or machine-broken? Machine-broken.
12128. What shape was it—was it flaky or angular? It was inclined to be flaky.
12129. So that the metal which Mr. Parkes asked you about just now you have actually used? Yes.
12130. It is a general practice to use it? Yes; ordinary 1½-inch metal, broken in a machine.
12131. It is very flaky as a rule? Yes.
12132. Very fine? Of course, you get a lot of fine stuff with it. It pays the contractors to get all the fine stuff they can. It is disallowed, I know.
12133. Why? Because it would be more bulky after being mixed—the fine stuff being mixed with the coarse stone.
12134. It makes more concrete? Yes.
12135. Have you read the specification as to the bluestone to be used in concrete? Yes.
12136. What impression have you as to the intent of the specification with regard to the size of stone that is to be used? It is supposed to be 1½-inch blue-metal, gauged in the proportions of 4, 2, and 1.
12137. Has anyone ever objected to your using stone below 1½-inch, provided there was no dust in it? It has been objected to.
12138. By whom? By Inspector Coulson principally.
12139. In any work I have had to do with have you ever found it objected to? No; I have used very little concrete under you in the way of bluestone concrete. It has been principally sandstone concrete.
12140. You said just now to Mr. Parkes that you did not think the other contractors, as compared with Carter, Gummow, & Co., had been treated properly;—you said you thought that undue preference had been given to Carter, Gummow, & Co.? Yes.
12141. Upon what grounds do you say that? On the ground of their tender being accepted for Contract 77 for the construction of the work on the Monier system.
12142. Have you any other ground? Yes; I do not think it is fair that they should have got the North Shore job without tenders being called. I refer to the extension of Contract 79A.
12143. You thought they should not have got that work; but suppose the Minister of the day, who had the matter in his hands, thought differently from you—suppose he thought they had a perfect right to it? I suppose he had a right to please himself. He had the power in his hands. Of course, I was dissatisfied.
12144. *His Honor.*] What is the reason you object to the screening? Because the forking was cheaper.
12145. How comes the forking to be cheaper than the screening? In forking the metal you just run the fork in under the heap of metal. If you have to cart it you throw it into a cart. If your gauging-board is sufficiently near you fork it off the heap into the gauge-box.
12146. It is the labour that is saved in forking? Yes.

- B. Rhodes. 12147. You save the metal in screening and the labour in forking? Yes. We were using Nepean sand, and it did not make much difference to us. We were not allowed to use more than a certain proportion of screening from the stone in the gauge box with the Nepean River sand, and I thought it unfair that we should have been allowed to use the screening and Nepean River sand for a lot of the work, and should suddenly have been prevented from doing so.
- 10 Aug., 1896. 12148. Your screening would make a good deal of stuff useless to you? Yes.
12149. You would get a good deal more stuff from the screening than you would be allowed to use? Yes.
12150. So that you would have no object in screening for that purpose? No.
12151. Still it would save the stone in the concrete, and give you better bulking? Yes.
12152. Labour however, came in as an element, making it cheaper on the whole to fork? Yes.
12153. *Mr. Davis.*] As to your price of 43s. per cubic yard for compo., have you had any experience to guide you in arriving at that conclusion as to the value of the work? I have had a good deal of experience in concrete, in different proportions of concrete, and it does not make a great deal of difference.
12154. You think there is very little difference between the work which is being carried out on the Monier system at Johnstone's Creek and ordinary concrete work? There is a little difference.
12155. On that basis you arrive at the conclusion that the work is worth 43s. per cubic yard? Yes.
12156. *His Honor.*] You have produced to-day a sample of the Nepean sand which you say was condemned? Yes.
12157. You say that that was rejected by Mr. Davis? Yes.
12158. On what grounds? Because it was considered rather fine.
12159. *Mr. Davis.*] As a matter of fact two qualities of Nepean sand are provided, are they not? I think they are.
12160. They are at different rates, are they not? Even if they are, I am under the impression that we paid the higher rate, but my partner would be better able than I am to give you particulars as to that.
12161. At any rate the sand specified in the sewerage specifications is the best Nepean sand? Nepean sand or sand equal to it as per sample in the office.
12162. That sample is the best Nepean sand? Yes.
12163. But there is another quality beside that? I know that we were paying for the best.
12164. *His Honor.*] Perhaps you were not getting it? Perhaps it was not quite as coarse as the sand in the office, but I am quite prepared to say that Nepean River sand is far before the crushed sandstone which we are using at the present time. It may be a little bit detrimental to me to say so. I remember making the remark to my foreman upon the work that if I were an engineer I would not allow that fine stuff out of the stone to be used in with the Nepean River sand.
12165. What are you using crushed sandstone in now? In the contract we are doing at Double Bay under Mr. Davis.
12166. Is there concrete work there? Yes; it is principally pipe-lying. There is concrete round the pipes and there are concrete manholes.
12167. How long have you been allowed to use crushed sandstone there? We have been allowed to use it since we started.
12168. When did you start? About 8 months ago.
12169. Who is in charge of the contract—who is supervising it for the Government? Mr. Davis.
12170. So that he seems to pin his faith to crushed sandstone, as far as you are concerned? Yes; he has been perfectly satisfied up to date.
12171. Did you request to be allowed to use crushed sandstone, or how did you come to use it on that job? Because the other contractors had been using it.
12172. Did you ask leave to be allowed to use it? No. I had a sample sent to the office which passed the required test.
12173. And you went on using it without any objection? Yes.
12174. *Mr. Davis.*] You requested that the sample should be sent? I do not remember that. I think I sent a sample without being asked.
12175. *His Honor.*] Where does the stone come from? From North Shore.
12176. And some of it is considered good? Yes. It is considered very good. Some of it is, of course, inferior to the other; there is no doubt about that. No doubt there is good stone there. If you could get first-class sandstone it would compare favourably with the Nepean River sand.
12177. You do not know whether the sand from this stone has actually passed a better test than the Nepean River sand? No, I do not.
12178. *Mr. Carter.*] Where do you get the crushed sandstone from at North Shore? That I could not tell you.
12179. I ask you because in your estimate for compo. this morning you allow 3s. 6d. per yard for sand? Yes. That would be 1s. less than we are paying—4s. 6d. Knowing you had a crushing machine at Annandale I made my estimate accordingly.
12180. I may tell you that our sand comes from North Shore, three miles further off than does your sand. Do you think that, under those circumstances, 3s. 6d. would be a fair valuation? No; I should think 4s. 6d. would be a fair valuation.
12181. Supposing we pay 5s.? Of course, I was under the impression that you were using some of the stone that came out of your tunnel; I thought you were crushing a lot of that stone out at Annandale.
12182. If we had the stone given to us for nothing it would not be fair for you to take that into consideration in valuing the work. You would have to take the market rates in making your valuation. You must not take the rates which we as individuals are paying. You must take the market rates 12 months ago? We will call it 4s. 6d.; I will put on the extra shilling.
12183. Referring to the Monier system, do you know as a matter of fact whether we had a patent for that system? The specification distinctly states that if there is any patent in the contract the contractor must pay the royalty on that patent.
12184. Were you prepared to pay the royalty, and do the work for the price you have mentioned? Yes.
12185. Do you know what the royalty is? From what I have heard I think it is 15 per cent. on the iron-work.
12186. Referring to the putting in of a lump sum tender, had you not as much liberty to put in a lump sum tender as we had? There was nothing in the specification as to that.



12187. But there was nothing to prevent you from putting in a lump sum tender had you chosen to do so? I think it would have been against the rules and regulations of the Tender Board. I know I thought so at that time.

B. Rhodes.

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12188. Are their any rules bearing upon that point—to what rule do you refer? I mean the rules for the system of tendering upon schedule rates. I do not know of anyone else doing what you refer to. I know that you also put in a lump sum tender for the Manly contract, and that it was not accepted.

12189. Our lump sum tender in that case you say was not accepted, so that there must have been some special reason for the acceptance of our lump sum tender in the case of the Balmain contract? Yes.

12190. *Mr. Parkes.*] In answer to Mr. Davis you said, as to the concrete in No. 77, that you took it as ordinary concrete—7, 3, and 2? What I thought I said was that it was similar work.

12191. The concrete used is 5, 3, and 2; would that be superior to 7, 3, and 2? Yes; I should think it was.

12192. What makes it superior? There would be less stone in it.

12193. And more cement? Yes; more binding power.

12194. That is what makes it superior? Yes.

12195. It is not by crowding in stone that you make concrete stronger? No.

Samuel Butcher, sworn and examined :—

12196. *Mr. Parkes.*] What is your occupation? I am a contractor.

S. Butcher.

12197. Have you carried out any sewerage works? I have carried out a good many of those works for the Water and Sewerage Board, but I have not done much of it for the Public Works Department.

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12198. Have you done much concrete work? Yes, for the Water and Sewerage Board, for manholes, &c.

12199. As to the bluestone concrete 4, 2, and 1—that is a Water and Sewerage Board specification, is it not? Yes.

12200. How much cement goes to a yard in that case? About a cask and a third to the cubic yard.

12201. Have you ever measured up sandstone concrete to see what it will go? A cask will go to about 24 feet.

12202. In mixing that concrete, do you use a fork to lift the metal? Yes; that is customary.

12203. Is it a regulation of the Department that the metal must be forked? Yes; we always do that.

12204. Do the Inspectors make you fork it? Yes.

12205. Have you ever done any work lately under the Department? Yes; I have a contract at Blue's Point—No. 122. Previous to that I have carried out a pipe contract for the Department.

12206. Of what does Contract 122 consist? It is mostly tunnel work—bluestone concrete and brickwork.

12207. In that case are you made to fork? I have not started the concrete yet. I am not ready for it yet.

12208. Which makes the most adhesive concrete—that which has a fair joint of cement running through it or that which has a thin joint of cement in the interstices? I should think the cement with the thicker joint.

12209. The concrete has to rely upon the cement? Yes.

12210. *Mr. Davis.*] Did you wait upon Mr. Parkes? Yes; I was one of those who waited upon him as a deputation in the interests of contractors to try to prevent the letting of contracts privately without calling for tenders, and also the granting of concessions to certain firms.

12211. What were the contracts privately let to which you referred? There were three extensions at North Shore let to Carter, Gummow, & Co. without tendering, at a cost of £16,000 or £17,000. These extensions have been completed some months ago, and the work cannot be utilised for some time to come. We thought it unjust that contracts should be let in that manner.

12212. What other contracts had you in your mind? That is all, with the exception of Contract 77, which was tendered for at schedule rates, and was let to Carter, Gummow, & Co. upon their lump sum tender.

12213. That you objected to? Yes.

12214. I suppose you would grant that even while the contractors are entitled to fair play and justice the Minister would be supreme in all such matters? I cannot answer that.

12215. With regard to the thick joints in between the stones in concrete—what would you say the thickness of a joint should be;—have you any very decided opinion as to whether there should be much or little? No.

12216. You have not gone into that subject from a scientific standpoint? No.

12217. Has the sandstone you have used been knapped stone? Yes; broken with a hammer.

12218. And you say the fork has been used by regulation? Yes.

12219. Where do you find the regulation? In the specification.

12220. Which specification? They always order it to be forked in lieu of screening.

12221. But what specification are you referring to? The Water and Sewerage Board's specification.

12222. You do not know whether in connection with Contract 122 any forking is specified there? I have not noticed it. It is all bluestone concrete on that contract.

12223. Is there not a clause as to the elimination of sand, as in all other contracts? I believe there is; but I have not noticed it.

George M'Credie, recalled and further examined :—

12224. *Mr. Parkes.*] I believe you wish to make some alterations in your former evidence in which you described how you made your tests for your brickwork, and referred to the quantity of cement going into it;—I believe you wish to illustrate what you then said? Yes. On 31st July, Mr. Davis asked me some questions as to the size of the bricks. You will see the matter to which I refer at Question 10,459. On reading the evidence after it had been handed to me for revision, I thought I had, perhaps, made a mistake, but on getting the bricks I find that that is not so. I have brought you some bricks to-day which were used in our tests, and you will be able to see the exact size of them, so that there may be no mistake.

G. M'Credie.

10 Aug., 1896.

12225. *Mr. Davis.*] Did you select the bricks? They are taken out of the stack we tested.

12226. But did you select these bricks specially? No.

12227. They are a fair sample of the bricks you used? Yes; they measure 9 inches long, and they are barely  $4\frac{1}{4}$  inches wide. I remember your asking me how closely we put the two bricks together in the 9-inch

G. M'Crede. 9-inch work, and you implied that there would be an inch joint. As a matter of fact, the bricks were only  $4\frac{1}{4}$  inches. I produce to-day some of the bricks we used in the wall test, and also some of the bricks we used in the arch test. You will notice that in the bricks used in the arch there is no frog. They are rough, wire-cut bricks. We found that it took half a cask to do a yard in the arch, and in the wall we found that it took more.

12228. *Mr. Parkes.*] Where the bricks are specially radiated, the joint would be smaller? The joint would be a little smaller.

12229. The other day you inadvertently said 4 inches instead of  $4\frac{1}{4}$  inches? Yes.

12230. *Mr. Davis.*] That would allow for a collar-joint? It allows for what you call a collar-joint in 9-inch work.

12231. You have therefore allowed for a collar-joint? There is a clause in the specification which says:—

112. Wherever concrete is to be built on to and against brickwork, or brickwork on to and against concrete, the latter in each case to be well wetted and grouted, and then to be covered with a coat of cement mortar, collar-joint,  $\frac{1}{2}$  inch thick, before the concrete or brickwork is built against it.

113. Prior to commencing any concrete or brickwork which has to be built on to and against rock faces, all shaken and loose rock to be removed, all rock surfaces to be well cleaned, washed, and wetted, and all beds, open joints, and spaces between concrete or brickwork and rock faces, to be carefully filled in with cement mortar, and flushed and grouted every course as the brickwork proceeds; and the cost of thus preparing rock faces, washing, grouting, flushing, &c., to be included in, and covered by, the Schedule price per cube yard for the concrete and brickwork herein referred to.

Clause 11 also says:—

11. Bricks to be double-pressed, of well-mixed material of approved quality and uniform fineness; to be new, sound, hard, and well-burnt, kiln bricks, free from cracks and all other defects, equal in every respect to the sample brick to be seen at the Engineer's office. They are to have sharp arrises, and to be of approved dimensions, form, and colour, and, when ordered, to be specially moulded. Radiating and specially-formed bricks to be provided for all segmental shafts. All bricks to be subjected to the following tests:—

(a) *Tensile strength.*—The tensile strength to be tested, in the departmental testing machine, by laying the brick horizontally on its base of 3 inches, between supports 7 inches apart, and the strain applied across the centre of the brick. An average breaking strain of twelve bricks to be taken, which must not be less than 8,000 lb.

(b) *Porosity.*—Bricks immersed in water for twenty-four hours must not increase in weight more than 3 per cent.

Should the twelve bricks fracture under the foregoing average strain, or prove more porous than 3 per cent., then the Engineer may reject the whole stack of bricks from which the twelve bricks were taken.

12232. *Mr. Parkes.*] You have made further tests of what concrete will consume in the way of cement, if carried out entirely with all the small stone and everything in, in relation to the contracts which have been referred to? Yes.

12233. Will you read your report? Yes; it is as follows:—

Dear Sir,

250, Pitt-street, Sydney, 10 August, 1896.

As requested by you, we have made a further test of the sandstone and bluestone concrete as specified by the Sewerage Construction Department, dispensing this time with the use of the fork.

The ballast in each case was shovelled from the large heaps upon which it had been knapped, and placed upon an eighth of an inch screen. There it was washed, and all that did not pass through the screen was shovelled into the gauge-box. We followed the same method of testing as previously described in our report of the 23rd ult., and the ballast contained a very large proportion of stone the size of a pea.

The results were as follows:—

*First*—Sandstone concrete. Proportions specified—1 cement, 2 sand, 5 stone. The sand and cement entirely disappeared in the sandstone, showing that it would require 1.35 casks of cement for each cubic yard of concrete, as we previously reported.

*Second*—Bluestone concrete. Proportions specified—1 cement, 2 sand, 4 stone. This showed a slight increase in bulk, amounting to one-twenty-fourth, or equal to 1.6172 casks of cement per cubic yard.

Providing that the Department did not insist on having the ballast forked, and allowed the concrete to be made as we have done in this test, the deduction of cement would be 553 casks in Contracts 69, 79, and 79A, and ten casks in the remaining contracts.

We may say that these tests were, as in the former instances, made in the presence of Messrs. A. L. M'Crede and Geo. Donald.

We are, &c.,

GEORGE M'CREDE,  
W. THOMPSON.

Varney Parkes, Esq., M.L.A., Public Works Inquiry Commission.

I should like to point out that Mr. Davis asked me the other day where I got the description of the 7, 3, and 2 concrete. I find in looking up the papers that it came out of Contract 77. The clause is as follows:—

#### 11. Concrete Work.

The concrete to be used in foundations of all piers, and in all piers and abutment piers, for the 12-foot, 33-foot, 48-foot, and 57-foot, span arches up to level of springing and top of plinths, in haunches and spandrels, between and over all arches between external brick-facings, up to level of underside of string-course (6 inches below invert of sewer), in retaining walls along road deviations and roads, round storm-water discharge pipes, round stoneware pipe where directed, and where ordered in any situation in the construction of these works, to be sandstone concrete of the quality specified in clause 142 of the schedule to specification.

The concrete to be used in inner sewer lining (between brick facings) of aqueducts to be special bluestone concrete of the quality specified in clause 141 of the schedule to specification, except that in this instance the bluestone metal to be broken to a size to pass freely with its largest dimensions through a ring of  $\frac{3}{4}$  inch in diameter, to be screened and washed as specified in clause 140 of the schedule to specification.

The concrete to be used in lining sewers in tunnels, open cuttings, in ventilating shafts, drops, weir-chambers, inlets, flushing, gas-check, and other gas-chambers, and where ordered in the construction of these works to be bluestone concrete of the quality specified in clause 140 of the schedule to specification. The whole of the concrete work comprised in this contract to be commenced, executed, and completed (including the iron bond-rods in concrete lining of sewer on lines of aqueducts as described in clause 164 of the schedule to specification), as shown on drawings, and as specified in the schedule to specification in clauses 140 to 171.

12234. Will you now turn to clause 164 of Contract 77? Yes. It is as follows:—

In conjunction with the concrete surrounding sewer, where the latter is built upon arches and in embankments, the contractor to provide, fit, place in position, and wall in with the concrete longitudinally, in each corner at top and bottom of concrete lining  $\frac{3}{8}$ -inch diameter bond-rods in 16-foot lengths. The ends to overlap 12 inches, and tied together with binding-wire, and, transversely,  $\frac{3}{8}$ -inch diameter bond-rods  $4\frac{1}{2}$  inches above soffit of sewer of such lengths as to fit between the outer brick lining, or as shall be directed, spaced 10 feet from centre to centre. The cost of providing, fitting, placing, and walling-in, said bond-rods to be included in the schedule price per cubic yard of concrete.

12235. Is that clause not similar to the clause in Contract 112 dealing with the bond iron? It appears to be the same.

12236. If that work were presumed to be effectual in Contract 112, would it not be effectual in Contract 77? I should think so.

12237. You have not before seen the clause in the specification which you have just read? No; I saw it G. M'Creddie for the first time on Saturday.
12238. Therefore, you did not include that in your prices of the departmental design? No; it is not a very expensive item. It seems to me to be the Monier system pure and simple. The Monier system does not consist of the distance between the rods, but relates to the method of fixing them.
12239. As to the concrete, what was the object of putting special concrete 5, 3, and 2, in these aqueducts in Contract 77? I could not tell you.
12240. Is 5, 3, and 2, a superior concrete to 7, 3, and 2? I could not tell you unless I went into the matter.
12241. Surely your knowledge of concrete ought to instruct you to that extent? It depends upon what you are going to use it for.
12242. Is it superior or inferior concrete to 7, 3, and 2? It ought to be better concrete.
12243. Have you observed the carrier of Contract 77? Yes.
12244. Is there in it any association of small sandstone ballast with the bluestone? There is a small quantity of sandstone. You can see the sandstone inside the carrier associated with the bluestone.
12245. Showing on the surface? Yes.
12246. Is that work fairly open and irregular on the face? Yes. Before it is rendered.
12247. Its efficiency has to rely upon the rendering? Yes. Of course, the rendering would go well into that surface.
12248. *His Honor.*] Do I understand you to say that the irregularity of the surface is an improvement? It is no detriment. It makes the rendering hold on to it.
12249. It gives a better bond? Yes.
12250. *Mr. Parkes.*] Do not some of these inequalities penetrate almost through the whole mass of stuff? Well, the iron shows through on the top. It does not seem to go in as closely as it might do. You can see little particles of metal up against the iron. It will want well grouting when it is rendered.
12251. The iron shows occasionally? Yes, but only at the top of the carrier. It may be that, if it is very carefully rendered, the rendering will go right in round the iron.
12252. *His Honor.*] The rendering will be better than the original substance of the concrete itself—it will be a richer material? Yes.
12253. *Mr. Davis.*] You have told us each time you have been here that you are satisfied with the results which you have obtained from the experiments you have made and with the figures you have put before the Commission;—are you satisfied on this occasion? Yes.
12254. It does not strike you that your being satisfied this time is rather inconsistent with the satisfaction which you have expressed previously? I do not understand what you are trying to get at. I want it to be understood that in dealing with these matters which have been brought before the Commission I have come here to tell the Commission exactly what I find. Mr. Davis is apparently endeavouring to lead me up to give some answer which may mislead the Commission; but I have come here simply to tell the truth; I have nothing to hide; I am here only to do my duty, and I consider that I have done it. If Mr. Davis has any straight question to ask me, I will give him a straight answer.
12255. *His Honor.*] As far as the comparison of 5, 3, and 2, and 7, 3, and 2, concrete goes, I suppose you would put it in this way: That 7, 3, and 2, would be as strong a piece of concrete, if properly mixed, but that 5, 3, and 2, would probably have better adhesive power to the iron, because of there being less likelihood of metal in immediate contact with the iron than would be the case with the 7, 3, and 2, mixture? Yes.
12256. There would be less chance of its non-adhesion from pieces of stone coming straight in contact with the iron bars? Yes.

William Thompson recalled and further examined:—

12257. *Mr. Parkes.*] In conjunction with Mr. M'Creddie, you have made further tests as to the quantity of cement which would go into the various concretes? Yes.
12258. Will you describe to His Honor the effect of your tests? I have already made a report upon the subject, which I understand Mr. M'Creddie has read.
12259. You endorse that report? Yes.
12260. You did not, in connection with Contract 77, take into your estimate of the cost of the original departmental plan the ironwork which is provided for in the specification, and which missed your attention? No.
12261. I believe the specification provides for ironwork similar in its nature to that provided for in the specification of Contract 112? Somewhat similar.
12262. You have nothing upon which you desire to comment in connection with your concrete tests? No.
12263. Do you wish to in any way alter your evidence as to the rest of the cement tests you have made? No; only as indicated by our report.
12264. The object of your making the alteration to which you now refer was to keep literally to the meaning of the specification? Yes; using the screen instead of the fork.
12265. Not that it makes a great deal of difference? No; especially in the sandstone concrete.
12266. You yourself know very little about concrete? No; I do not profess to know much about it.
12267. You are a quantity surveyor? Yes.
12268. In carrying out your profession it is necessary that you should have an understanding from day to day of market values? Yes; I suppose I price a job twice a week at the very least, sometimes daily.

W.  
Thompson.  
10 Aug., 1896.

WEDNESDAY, 12 AUGUST, 1896.

William Thompson recalled and further examined:—

12269. *Mr. Parkes.*] Have you prepared a return showing the items upon which Carter, Gummow, & Co. are paid in connection with Contract 69? Yes. [*Vide Appendix, No. 43.*]
12270. Will you read the numbers of the items upon which they were paid at the completion of the work? Yes. The items are 1, 8, 11, 12, 14, 16, 19, 20, 21, 22, 28, 29, 30, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 45 to 82, 83, 84, 85, 86, 95, 96, 97, 99, and 100.

W.  
Thompson.  
12 Aug., 1896.  
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12271. You have seen in the Parliamentary papers a return showing the tenders of the various contractors and the details of the prices which they have affixed to the quantities supplied by the Government? Yes.
12272. And upon that you have made a calculation showing what the prices paid on the completion of the contract were, including the extra quantities; showing also what would have been the position of the various contractors if they had been instructed by the Department to construct the work upon the particular items upon which Carter, Gummow, & Co. were paid? The return I have made shows the relative amounts of the various tenders received, based upon the quantities actually paid for. [*Vide Appendix, No. 48.*]
12273. Will you give the totals of the various contractors, taking Carter, Gummow, & Co.'s total first? Yes. Their total was £54,320 7s. 7d.; Ahearne's was £48,002 8s. 8d.; Kerle and Kerle's, £56,998 15s. 10d.; M'Kenzie's, £51,494 9s. 2d.; M'Sweeney's, £59,376 1s. 9d.; Holloway Bros., £54,823 12s. 2d.; Carson's, £55,489 5s. 5d.; Dean's, £57,456 19s. 7d.; Langtry and Owen's, £66,579 12s. 11d.; Parry and Farley's, £66,913 14s. 2d.; Stewart's, £75,570 5s. 10d.
12274. Will you read the amounts of the tenders originally sent in by these contractors? Yes. Carter, Gummow, & Co.'s tender was £45,207 8s. 11d.; John Ahearne's was £47,061 3s. 9d.; Kerle and Kerle's, £52,735 10s. 9d.; M'Kenzie and Sons' was £53,505 2s. 7d.; M'Sweeney's, £54,623 18s. 2d.; Holloway Bros., £55,104 8s. 9d.; Carson's, £57,239 0s. 9d.; A. Dean and Son's, £58,165 10s. 8d.; Langtry and Owen's, £59,676 16s.; Parry and Farley's, £63,095 11s. 11d.; J. Stewart & Co.'s, £68,171 6s. 9d.
12275. Take John Ahearne's tender;—what is that tender, taking the original items, in excess of Carter, Gummow, & Co.? £1,853 14s. 10d.
12276. If John Ahearne had worked upon the schedule selected for Messrs. Carter, Gummow, & Co., how much less would the amount have been? £6,317 18s. 11d.
12277. That is, on the final voucher? Yes.
12278. What are the particulars as to other contractors in a similar relation? Kerle and Kerle, who stood third, would actually have been higher than Messrs. Carter, Gummow, & Co.; M'Kenzie would have been less.
12279. Would Kerle and Kerle's tender have been reduced? No; it would have been £4,263 5s. 1d. over. M'Kenzie's tender would have been reduced by £2,010 13s. 5d.
12280. And M'Sweeney's? He would have been increased by £4,752 3s. 7d.
12281. And Holloway Bros.? That would have been reduced by £280 16s. 7d.
12282. What about Carson's? That would have been reduced by £1,749 15s. 4d.
12283. And Dean's? That would have been reduced by £708 11s. 1d.
12284. The others would have been increased? Three would have been increased.
12285. How many contractors, upon the schedule selected for Messrs. Carter, Gummow, & Co., would have been below on the completion of the work? Two of them—Ahearne and M'Kenzie.
12286. Have you prepared a sheet showing the items upon which Messrs. Carter, Gummow, & Co. were not required to work—that is, the items which are eliminated; and does that return show the relation of the items eliminated to the tenders of the other contractors? Yes; the return gives a list of the items omitted, priced out at the respective schedule rates. [*Vide Appendix, No. 49.*]
12287. Will you read the numbers of those items? 2, 3, 4, 5, 6, 7, 13, 15, 17, 18, 23, 24, 25, 26, 27, 37, 44, 87, 88, 89, 90, 91, 92, 93, 94.
12288. Will you give the relation between the price of Messrs. Carter & Co. and that of the other tenderers on that basis? Yes; Carter & Co., £4,353 2s. 11d.; Ahearne, £6,814 19s.; Kerle and Kerle, £6,523; M'Kenzie, £8,070; M'Sweeney, £8,447 12s. 6d.; Holloway Bros., £9,698 15s.; Carson, £7,962 7s. 6d.; Deane, £8,682 15s.; Langtry, £9,847 14s. 6d.; Parry and Farley, £9,534 0s. 2d.; Stewart, £12,691 7s. 6d.
12289. Does your return show that the costly items were eliminated to the advantage of the contractors? The item subducts was omitted amongst others.
12290. But, taking the average of the list, are the cheaper items or the costly items omitted? The cheaper items are omitted in seven or eight instances.
12291. Will you look at item 34;—what is cement facing put down at by Carter, Gummow, & Co. in their tender? 5s. a superficial yard  $\frac{5}{8}$ " thick—1 to 2.
12292. Is that an excessive or moderate price? It is a very excessive price.
12293. Look also at the item of timber and iron in excavations;—what is Carter, Gummow, & Co.'s price for that? 1d.
12294. Turn now to the schedule of Messrs. Carter, Gummow, & Co.'s prices upon page 76 of the Parliamentary return, and tell me what it amounts to? 9,000 cubic feet.
12295. Turn now to the payment upon the final voucher;—how many feet are given there? 9,818 feet.
12296. Therefore, that would be 818 feet in excess of the item given in the schedule? Yes.
12297. If Mr. Hickson said in his evidence that there would be 9,000 feet extra, that would be a mistake? An evident mistake.
12298. The cement facing at 5s. will return the contractors far more than double the loss upon the timber, will it not? Yes, certainly. You cannot count the whole value of the timber as lost, because the cost of the timber is put into the excavation.
12299. But taking the proportion of these two items? The timber, I suppose, would cost about £740, and the cement facing is an item of £2,690. The profit on that item, the net value of which is about 1s. 6d. per yard, would far outweigh any loss upon the other.
12300. There is not such a serious loss upon the timber, then, when you have regard to some of the other items upon which Messrs. Carter, Gummow, & Co. were paid? No.
12301. Coming to the item of subducts at 1d.;—if those subducts had been put into the contract, would they not, as a matter of fact, have facilitated the work? Yes; of course that depends upon the nature of the country passed through.
12302. If water ran through these sewers while they were in course of construction it would carry material away with it? I presume so. Of course I do not know much about the construction of sewers. I do not pretend to do so.
12303. You have had a great deal of experience in the making out of tenders and quantities; can you understand how items in the tender, measured up, would come out uniformly, item after item;—could that happen? No; each particular class of work is supposed to have a special value. The values would differ naturally.

12304. Can you imagine why uniform prices should have been put into Carter, Gummow, & Co's. tender ;— with what object would it be done ? I cannot say ; I cannot make that out.
12305. Coming to the item of excavation ;—it is divided into excavation in the tunnelling and excavation in the shaft ;—as to excavation in the shafts, can you understand how it is that it is put at 4s. in the hard rock with light blasting, and also at 4s. under the heading of soft material ? No ; there ought to be some increase in price.
12306. Can you also understand why heavy blasting should be put at 4s. and guttering and gadding should also be put at 4s. ? No.
12307. Then, coming to the item of excavation in less hard material, at 40s., can you understand the sudden difference in price ? No ; that is the cheapest of the whole of the classes of shaft work. It should not be at that price on the face of it.
12308. You could not, as a quantity surveyor, honestly, in making up a tender, put in figures like that, could you ? No ; it could not be done unless one knew the quantities likely to be exceeded.
12309. Supposing you did put in such figures, would they not be disastrous to your client ? Unless one knew that there would be more of a particular item and less of another. Then it could be done safely.
12310. It could be done if the contractors had information beforehand, but not otherwise ? The information might be gathered in various ways.
12311. *His Honor.*] The table you have handed in is a correct comparative statement of the whole of the contractors' schedules ? Yes ; I have carefully checked the items.
12312. I suppose the table explains itself ? The headings explain it.

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James Symonds recalled and further examined :—

12313. *Mr. Parkes.*] You have paid a visit to the Monier culvert at Strathfield ? Yes.
12314. Is it in good order ? Yes, it is in fair order.
12315. Have you made an estimate on the comparative cost of this culvert carried out by the Department, and the cost of a brick arch ? Yes. [*Vide Appendix, No. 50.*]
12316. *His Honor.*] I suppose you mean a brick arch of the same capacity ? Yes.
12317. *Mr. Parkes.*] What is the thickness of the brick arch you have estimated ? I have taken out a 9-inch brick arch and a 14-inch brick arch.
12318. As a substitute for the Monier work a 9-inch brick arch would have to be used ? Yes.
12319. It would be 9-inch radiated brickwork, laid in cement mortar ? Yes.
12320. Is your 14-inch work also laid in cement mortar ? Yes ; both of them. The area of the arch is 351 superficial feet. The cubic contents of the 4½-inch work are 4¾ cubic yards ; of the 9-inch work, 9¾ cubic yards, and of the 14-inch work, 14¾ cubic yards. The estimated cost of the 9-inch work at 45s. per cubic yard would be £21 18s. 9d., or equal to 4½-inch Monier compo. work at 90s. per cubic yard. The estimated cost of 14-inch brickwork in a cement arch would be, at 45s. per cubic yard, £32 18s. 1½d., or £4 2s. less than the actual cost of the present Monier arch, which amounts to £7 11s. 6d. per cubic yard, or a total of £37.
12321. Where did you get your amount of 90s. per cubic yard for the Monier compo. work ? That is the price you gave me.
12322. That is what you saw in the printed evidence pointed out to you by me ? Yes.
12323. Do you know what it actually cost ? £7 11s. 6d. per cubic yard.
12324. What would that cost be composed of ? It is principally due to supervision, and the arch was carried out by day work. There was some hindrance after the first section was put in. They had to wait some time before they could let the traffic over it. They waited, I think, nearly a fortnight.
12325. That increased the cost ? It increased the cost, because the men were not doing much. They were merely preparing the stone. That is what they were doing on several days.
12326. Are you still under the impression that a barrel drain would have been sufficient for the purpose ? Yes ; I think a 3-foot barrel drain would have been sufficient.

J. Symonds.  
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Joseph Davis recalled and further examined :—

12327. Were you supervising engineer upon Contract 69 over all the other engineers ? Up to April, 1895.
12328. You wrote the following minute :—

J. Davis.  
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Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 9 May, 1894.

*Subject* :—Contract No. 69, Eastern Branch, Western Suburbs—Pitching round Man-hole Covers.

As some of the man-holes on this contract are being constructed, I should like the Engineer-in-Chief's decision as to the kind of pitching, if any, which is to be put round the man-hole covers.

Twelve square yards of squared bluestone pitching were included in the schedule of quantities, which the contractors have priced at £50 per square yard. The quantity likely to be used if the whole of the man-holes are to be pitched will be 35 square yards, which, at schedule rates, will amount to £1,750.

Special bluestone concrete will answer the same purpose as bluestone pitchers, and will only cost—9 cubic yards, at 50s.—£22 10s.

The fair price for bluestone pitching is about 25s. per square yard, and, as the schedule rate is so much higher than the market rate, the question arises whether the pitching should not be omitted. If, however, this course is considered to be unfair to the contractors, then only the quantity included in the schedule of quantities need be carried out.

J.D.

We cannot in fairness omit an item for which, no doubt, the price is absurdly high, while we know that on other items the price is equally low. Where bluestone pitchers are shown on drawing contractors must be paid for same at schedule rates.—R.R.P.H., 11/5/94.

Mr. Millner to note.—J.D., 11/5/94.

Noted.—W.J.M., 11/5/94.

Mr. Davis.

File.—J.D., 15/5/94.

When you wrote that minute you pointed out that this item could be omitted ;—on what grounds did you do that ? I went on the general ground of the clause attached to the contract and contained in the general conditions giving the engineer power to omit or to increase work at his will. The question is, how far that would apply in a case of this sort—equitably, I mean.

12329. There is such a clause in the specification ? Yes.

12330.

J. Davis. 12330. If that clause is put in to assist the Engineer-in-Chief or his sub-officers from being bested in the rigging of schedules, what would you say to that? I should not say that that was the reason for putting it in. The reason is that exigencies might arise in connection with the work—that is, during its progress—which would necessitate an alteration of the design, with possibly an omission or increase. I should say that that would be the primary reason for the insertion of that clause.

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12331. It is practically the same thing? I do not think that general conditions contemplate the rigging of schedules to the extent that we had in Contract 69.

12332. You say, "If, however, this course is considered to be unfair to the contractors, then only the quantity included in the schedule of quantities need be carried out."—You referred there to 12 yards in probable quantities? Yes.

12333. In connection with the substitution of a single for a duplicate sewer, will you read Letter No. 25, which appears upon page 127 of the Parliamentary papers? Yes; it is as follows:—

Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 21 September, 1894.

*Minute Paper.*

*Subject* :—Western Branch, Western Suburbs, recommending that a single sewer be substituted for the two sewers originally proposed.

In the original scheme for the drainage of the western suburbs two sewers are provided to run side by side from Premier-street to a point in the Terrace Road where the Canterbury sewer branches off to that suburb, a length of 70 chains. Over twelve months ago the survey was completed for the two sewers, and in anticipation of their being continued the length of tunnelling and lining from Premier-street to the Illawarra Road was included in the contract for the eastern branch. The tunnel is now driven for the two sewers for this length, and the lining will be proceeded with in a few days.

With a view of seeing how the cost of a single sewer would compare with that of a double one, estimates have been prepared, which I attach. They show that the double sewer—

|  |   |    |    |
|--|---|----|----|
| For the length from Premier-street to Terrace Road, exclusive of shafts and aqueduct,<br>to be ..... | £   | s. | d. |
|  | 22,867                                    | 3  | 9  |
| And the single sewer, 7 ft. 8 in. x 6 ft. 8 in., to be, on same basis.....                           | 13,758                                    | 13 | 9  |
|  | Saving in favour of one sewer .....       |    |    |
|  | 8,108                                     | 10 | 0  |
| To this must be added saving in shafts.....  | 1,000                                     | 0  | 0  |
| And saving in cost of aqueduct .....   | 1,500                                     | 0  | 0  |
|  | Total saving in favour of one sewer ..... |    |    |
|  | 10,608                                    | 10 | 0  |

12334. Who prepared the original plans for the duplicate sewer? It was Mr. Stayton's proposal, passed by the Public Works Committee.

12335. Who was chief of the Department then? Mr. Bennett.

12336. The successor of Mr. Bennett cured the mistake? I would not regard it as a mistake, because I know the object they had in view in putting in two sewers at the time they were adopted. The survey that was made was very rough indeed. It was a question as to whether by raising the flow line a foot they could get through some of the depressions that existed, so that I should not regard it as a mistake by any means. I took advantage of the fuller knowledge we had, and made a proposal which will have the effect of saving over £10,000.

12337. That is not a saving though, is it? It is a saving.

12338. The work has not commenced? It is in hand.

12339. But when this minute was written the work had not commenced? It had practically commenced. If the original design had been put in between Premier-street and the Illawarra Road, then the whole of the 70 chains must have been constructed in that way. It was a question of arriving at a decision at that stage for the carrying out of the proposal.

12340. Will you read the further letter which you wrote, and which appears upon page 131 of the Parliamentary papers—I refer to paper No. 26? Yes; it is as follows:—

Gentlemen,

Department of Public Works, Sewerage Branch, 11 October, 1894.

Referring to the conversation which I recently had with you, and to the interview which Mr. Millner had with you two weeks ago respecting the substituting of a single sewer for the double one, shown on contract drawings, between Premier-street shaft and the shaft at the Illawarra Road, I have the honor to inform you that the Engineer-in-Chief has decided to substitute a 7-ft. 8-in. x 6-ft. 8-in. sewer for the double one, and that you will be allowed for the expense you have been put to in connection with the double sewer, as arranged with Mr. Millner, viz., £37 10s.

The cross section of sewer will be as shown on attached tracing. Drawings will be forwarded in a few days of the shaft at the Illawarra Road, and of any slight alteration it may be necessary to make in the inverts of the Premier-street shaft chamber.

In the meantime you will please proceed with the construction of the single sewer, as shown on the tracing attached.

I have, &c.,

J. DAVIS,

Supervising Engineer for Sewerage.

12341. Will you read the next paper? Yes. It appears to be a letter from Carter, Gummow, & Co., to the Engineer-in-Chief for Sewerage, and is as follows:—

Sir,

Marrickville, 11 November, 1894.

In reply to your letter of 11th October, with regard to alteration of design between Premier-street shaft and Illawarra Road, we beg leave to state that we will accept the terms therein, provided a special item be arranged for the filling at the rate of 5s. per cubic yard.

Yours, &c.,

CARTER, GUMMOW, & CO.,

Contract No. 69.

Mr. Davis.—R.H., 11/11/94.

Commissioner for Roads.—D.C.M'L. (*pro* U.S.), B.C., 15/11/94.

Will Mr.

Weedon please let me have quantity of filling.—J.D., 17/11/94.

Quantity of filling, due to alteration in design, 410

cubic yards.—S.H.W., 20/11/94.

12342. Will you read your recommendation, which appears upon page 132 on the Parliamentary papers? Yes.

The schedule rate for filling is 6d. per cubic yard, but it is manifest that the contractors, in giving this low price, did not contemplate doing the kind of filling required in connection with the western branch sewer, between Premier-street and Illawarra Road. The 5s. asked is, I consider, a little high, but I suppose, as they will lose something by the reduction of concrete and brickwork, occasioned by the alteration, it will be just to take this into account, and allow them what they ask. There will be about 400 cubic yards of this filling, which, at 5s. per cubic yard, would amount to £100. I recommend that the price named be approved.—J.D., 21/11/94. Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage.

12343. Is not that rather an excessive price? No doubt it is a little high.

12344.

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12344. Is it not treating the contractors rather generously to reduce the £750 they undertook to forfeit after making an arrangement with them to do the work under these conditions? I do not think it is treating them so very liberally. It must be considered that they met us very fairly. They had everything ready to proceed with the two sewers, and I saw that what we proposed was going to be an advantage to us. They met us fairly and willingly, and I thought that they were entitled to consideration.

12345. Did you not think that they had got the best of the bargain? I do not see how they could. The only advantage would have been in about a shilling a yard for the price of filling, which would have amounted to about £20.

12346. Contractors, in their arrangements, generally take care that they get the best side of the bargain? Contractors are very much like other persons. I find that they like to do the best they can for themselves. You have to watch them.

12347. Will you read Mr. Hickson's minute, under date of 21st November, 1894? Yes; you will see it upon page 132. It is as follows:—

This addition is caused by an alteration in the original design, which has the effect of reducing the cost of the work in this contract by about £750, and a further reduction on the whole work of £10,000. Recommended for approval.—R.H., 21/11/94.

For approval.—J.B., 28/11/94. Approved.—J.H.Y., 29/11/94. Roads.—D.C.M'L. (*pro* U.S.), B.C., 29/11/94. Seen.—R.H., 30/11/94. Mr. Weedon to note.—J.D., 4/12/94. Noted.—S.H.W., 6/12/94. File.—J.D., 7/12/94.

I ought to explain that that amount is really £10,800.

12348. The work was not in course of construction? Not at that time.

12349. Suppose you take the £750 and deduct the £100 for filling and £37 10s. for centering? The question is whether it should be deducted. It is probable that it had been deducted by Mr. Hickson in connection with the £750. I do not know that it had been. I cannot speak positively about it; but that was probably the case.

12350. Is there not a grave error in the comparative estimates which appear upon page 131;—you will see there an estimate of an 8-ft. by 7-ft. single sewer; then there is an estimate for double sewers 6 ft. 10 in. x 5 ft. 10 in. and 5 ft. 2 in. x 4 ft. 2 in.;—you say that the excavation had been done? The excavation had been done for the 6 ft. 10 in. x 5 ft. 10 in. and the 5 ft. 2 in. x 4 ft. 2 in. sewers, and in the ordinary way the contractors would be paid for it. [*Vide Appendix No. 51.*]

12351. If that is so the quantity of 1,541·3 yards should not appear in those estimates, because it is common to both? No; I think you are looking at the matter in the wrong way. The excavation for the sewers 6 ft. 10 in. x 5 ft. 10 in. and 5 ft. 2 in. x 4 ft. 2 in. would come in to some extent. It would not be thrown away.

12352. The price paid for the 8-ft. x 7-ft. sewer is £3,452, and for the double sewers £4,173. That makes about £750 of difference, but you forget that the excavation was done in both cases. Therefore the £750 disappears? The excavation was done for the duplicate sewer, but there would be required in addition to that a certain amount of excavation in order to put in a single sewer. Part of the excavation in the duplicate sewer would go for nothing.

12353. The whole of the excavation was already done for the duplicate sewer, and you were about to put in a single sewer;—in making a comparative estimate with the 8-ft. x 7-ft. sewer you must add the total of the excavation? Not necessarily, because more excavation would be required for the single sewer than for the duplicate.

12354. There is a difference of £750 or thereabouts in the two estimates? That would seem to be the case as far as I can see.

12355. The actual difference is £721, is it not? Yes, apparently.

12356. There is nothing saved between the last two comparisons given upon page 131—I mean the totals of £4,068 and £4,173;—they are practically the same, so there is no £750 saved there, and there is certainly not a saving of £750 in the comparison given above? I will look into that matter. I really do not understand these estimates myself at the present moment. I do not see why two sets of estimates should have been given in the first instance at all in connection with the 8 x 7 sewer. For the moment I cannot think why that should have been done.

12357. But on the face of it, if the excavation is done it must be common to both estimates? In so far as the excavation would serve for the larger sewer.

12358. If it were increased for the larger sewer there would be an addition to the 1,541 yards? Yes; but I should be glad if you would kindly defer your questions upon this point. I will look into it, and I shall then be able to say precisely what did take place.

12359. Did you yourself check the final voucher for Contract 69? No; I had not charge of the work at that time.

12360. Who would be responsible for it? Mr. Darley, the Engineer-in-Chief; and Mr. Griffiths would be immediately under him.

12361. As you go along with the measurement of excavations, what is the course of procedure of the inspector on the work? The course is this: as soon as the shafts are bottomed, and we know precisely the kind of ground the tunnel has to be driven in, the contractor is instructed what size to drive the tunnel.

12362. Before he proceeds? Yes, you may say that. I do not know that he would stop his men until he got a letter, but that is the first thing done. As soon as the shafts are bottomed the contractor gets instructions what size he is to drive a tunnel. Those instructions may be varied during the progress of the driving until the tunnels meet.

12363. And the contractor is paid upon that? Yes; upon what is ordered.

12364. Are those instructions noted in any book? They are letters.

12365. Can you show us the letter-books? I believe so; I believe you will find all the letters there.

12366. When did you leave this job? In April.

12367. Was the excavation all done before April? I believe so. There would be very little to be done then.

12368. Was there any in the tunnelling to be done after April? I scarcely think there was, but I am not sure.

12369. Did the material vary much between the plan and the actual tunnel? It varied in this way: where we showed shale from the borings we found shale, but the shale varied in hardness. In some cases



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it would stand without timber; in other cases timber had to be inserted, and where timber had to be inserted, then the tunnel was necessarily very much larger. Where the tunnel was driven without timber in the shale, then it was driven for two-ring work.

12370. Could you mark on the plans the place where the hard shale occurred? I think there is a plan in existence showing the work as carried out, and you will see from that precisely what is done. If you have not got the plan here, I can supply it.

12371. Do the inspectors keep a record book containing the orders they give the contractors? They give no orders to the contractors. They have no discretionary power whatever.

12372. You alone do that? I or the Engineer-in-Chief would write the letters. The engineer upon the work makes reports from time to time, any changes in the size of the tunnel, or anything else of that kind which may occur. That is approved in the proper way, and the contractor is informed by letter.

12373. Would those letters appear in the letter-book? If Mr. Hickson wrote the letters they would be in his book, and if I wrote them they would be in mine.

12374. Could you furnish the Commission with particulars of the whole of the letters in connection with this particular contract? If they are not already printed, but I am inclined to think they are printed in connection with the Parliamentary return. I know that at the time the contract was let, in view of the fact that the contractors' prices were so very peculiar, to say the least of them, the utmost care was exercised so that we might get as good a result as possible. I know there were comparative estimates made of the shafts to find out whether it would be better to put in brickwork or concrete.

12375. Can you refer me to the letter in the Parliamentary papers containing the order as to the size the tunnel was to be driven? I think you will find that upon page 121 of the Parliamentary papers, paper No. 7. You will find there that the cross-sections are all shown. You will see that comparative estimates have been made of the different kinds of lining.

12376. Were the sizes not to be increased above those given there? No; those were the maximum sections.

12377. The maximum sections for which they would be paid? For excavation; then there is the margin for what we call the packing.

12378. How much would that be? I could not say. The measurement book would show it.

12379. Would it be 4 inches? It might be more. I am not sure whether in the specification there is any limit.

12380. Have you the measurement book here? I see that there is no limit to the packing in the case of this contract. The measurement book would show precisely what packing was paid for.

12381. And would the payment for excavation be limited to the cross-sections shown in the document to which you have referred? For excavation, certainly. The payments will be limited to whatever was ordered during the progress of the work. In addition to the concrete there would be the timbering on the outside. The plan I have sent for would show that. According to the contract the contractors would be entitled to excavation to the outside of the timber.

12382. By how much would the timber exceed these sections? First of all there would be a space between the outside of the concrete and the inside of the timber to admit of boxing being put round the concrete. That would be the first thing that would have to be allowed for. Then there would be the thickness of the leg or prop, and then behind that again there would be the poling boards. They would take up probably a space of  $4\frac{1}{2}$  inches.

12383. In your instructions the size of that margin would be allowed? Yes; there seems to have been a sketch upon my letter No. 9. I will read the paragraph referring to it. For instance, I say, "As to tunnels in more or less hard material which require timbering, I have to request that you will excavate the same to the cross-sections shown in the margin."

12384. Are the sections shown in the Parliamentary return marginal sections? I am referring now to a sketch on the margin of my letter. Carter, Gummow, & Co. will have that letter if it be in existence at all.

12385. Ought not the sketch to be shown in the copy of the letter? No; because it is usual to send the letter to a draftsman, and any sketch which it is necessary to put on the side of it would be put in with Indian ink, and that would not copy.

12386. Would you not keep a record of it? I have no doubt there is a record, but I do not know where it would be.

12387. Do you recollect what the size was? It would be about the size I say.

12388. About what size is that? I can only give it to you approximately. It would be about 2 ft. 6 in. wider than the concrete—that is, going to the outside of the timbering. There would be about 15 inches on each side.

12389. Would there be as much as 15 inches on the outside of the concrete on each side? Yes.

12390. I suppose that in no case where timber was used would the 15 inches be exceeded? That is an approximate measurement. That would be the usual size which would be allowed for the excavation.

12391. With reference to the surplus material, do you know where it was carted to, or whether it was carted away at all? I do not know what became of it. The contractors either took it away or arranged for it to go away. That is all we were concerned with. In that particular contract we did not want the material ourselves. Had we wanted it we could have ordered it to be taken to wherever we required it; but, it not being required, the contractors were left to dispose of it as best they could.

12392. Referring to the Premier-street shaft, was any portion of that shaft done under Contract No. 62? Yes; the shaft was sunk. I am not sure about the dimensions, but I think it was 5 feet by 12 feet.

12393. Who had Contract No. 62? Mr. McSweeney.

12394. Did he do any work in connection with the shaft besides sinking it? No, I think not. He sank the shaft and used it to drive his tunnel. That was lined up to within a short distance of the shaft, and Carter, Gummow, & Co. would of course start driving their tunnel from that point. I ought perhaps to explain that it was originally proposed by Mr. Bagge that a very elaborate staircase should be put into that shaft, but Mr. Hickson, from motives of economy, had the drawing which Mr. Bagge had prepared cancelled, and another drawing was substituted before tenders were invited, with an ordinary plain shaft. Mr. Bagge then proposed to increase the size of the shaft to get the penstock up and down. It was a good idea, no doubt, but of course it would cost money. During the progress of the work, after taking the matter into consideration, I recommended that the shaft should not increase in size, and finally the shaft, as left by Mr. McSweeney, was lined with concrete and covered in at the top.

12395. Will you read your minute of 23rd March, 1895, which appears upon page 133 of the Parliamentary papers? Yes. It is as follows:—

J. Davis.

Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 23 March, 1895.

12 Aug., 1896.

*Minute Paper.*

*Subject:—Shaft at Premier-street.*

THE present size of the shaft at Premier-street, excavated under Contract No. 62, is 12 ft. x 5 ft. In Messrs. Carter & Co.'s contract, No. 69, provision has been made for enlarging the shaft to 14 ft. x 7 ft., and to line it with brickwork. The top of the shaft is left open, and surrounded by an iron railing, which would not prevent children and others getting into this shaft.

I do not think that there is any necessity to make the shaft larger than it is at the present time, and the iron railing would certainly be dangerous.

I recommend that the shaft be not increased in size, that it be lined with bluestone concrete, and that it be arched over, and a manhole cover be put on in the usual way. The saving that will thereby be effected will amount to £50.

J.D.

Approved.—R.P.H., 25/3/95. Messrs. Carter, Gummow, & Co., 25/3/95. Mr. Millner to note.—J.D., 25/3/95.  
Noted.—W.J.M., 29/3/95. Mr. Davis. File.—J.D., 30/3/95.

12395½. If that £50 represents the only saving, it would not have been so much more costly? Well, £50 is £50.

12396. Would there not be a greater saving than that effected in the abolition of the stone staircase alone? This recommendation has nothing whatever to do with the stone staircase. Mr. Hickson himself before the contract was let cancelled the original drawing, and the word "cancelled" was written right across it. That was before tenders were invited. The £50 refers merely to the enlargement of the shaft from 12 feet by 5 feet to 14 feet by 7 feet. Besides, you might say that the man who took care of £50 would be likely to take care of £50,000.

12397. Suppose the amount happened to be £150; the stone staircase is in the schedule, is it not? It may be included in the probable quantities, but it is not specifically mentioned. The drawing was prepared for a spiral staircase, but when the contract was submitted to Mr. Hickson he had that drawing cancelled and another drawing substituted.

12398. Then why did you not take the item out of the schedule? There is no such item in the schedule. What I said was that the work of the spiral staircase shown in the drawing might be covered by the schedule.

12399. The item of iron railing you say would be omitted, but, as a matter of fact, is it not paid for in the final voucher? It would not be paid for in the final voucher unless it were put in. I should be very much astonished to find that it was paid for.

12400. What is the price given by Messrs. Carter, Gummow, & Co. in their schedule upon page 67 of the Parliamentary return? That would be for the second design to which I have referred.

12401. You say in your minute of 23rd March that the top of the shaft is left open, and is surrounded by an iron railing; that iron railing was done away with, and a dome was put over the shaft? Yes. I myself did not carry out the work, but I recommended that that should be done, and I presume it was done.

12402. I think you will find that they were paid £10 17s. 5d. for the railing? I do not know whether they were paid for it or not, but if they were paid for it it might be accounted for in this way—that the contractors would get the railings before the alteration was made in the plan, and the Department might have to take them over on that account.

12403. But that would not include the fixing? I do not know of my own knowledge whether that would be included or not.

12404. Have you not been to the work since? Not to the Premier-street shaft.

12405. But if the amount has been saved it ought not to appear in the schedule, ought it? The railing could only have been paid for as you suggest, upon the supposition that I have just mentioned, if it were not actually used in the work. It would then be in stock for other use. It might not be worth the amount which you see put down in the papers, but it would be worth something.

12406. *Mr. Norrie.*] Might not the iron you refer to in the schedule have been fixed in the staircase below ground? I think it would be much better to ask Mr. Griffiths questions as to what was done with that railing, because after all he had to do with the matter.

12407. *Mr. Parkes.*] Was the plan you now produce showing the work which was actually done on Contract 69 made under your instructions? It was commenced during the time I had charge of the contract, and was finished off afterwards, when the final voucher was submitted.

12408. Complete measurements of the work can be obtained from this plan? I believe so, as far as I know. I have not checked it myself, but it should correspond with the final voucher.

12409. *His Honor.*] As to the bluestone pitchers;—do I understand that you contend that it was within the equity of the contract and specification that if more than the estimated quantity of work were ordered at an exceptionally high rate you could not take advantage of the condition in the contract enabling you to vary the nature of the work, and then to bring the work to be done under a lower rate? I think that by straining a point I might do that; but the question is whether it would be treating the contractor quite fairly. I know that I did that in respect to the guttering and gadding at North Shore, and it was a question with some whether I had not gone a little too far. However, I felt that it was the right thing to do under the circumstances, and I recommended it; I took the responsibility of it. In regard to the bluestone pitchers, I felt that it would be scarcely equitable to cut out the bluestone pitchers altogether. It was questionable in my mind whether the clause in the general conditions dealing with excess and reduction would quite cover such an action. I felt that perhaps if we gave them what was put in the schedule they could not complain. Mr. Hickson, on the other hand, thought that if we gave them what was shown on the drawings it would be as much as they were entitled to.

12410. Twelve yards were given in the estimated quantities? That 12 yards must be either a mistake on the part of the quantity surveyor or it must be a printer's error.

12411. Do I understand you to mean that the original drawings showed 32 square yards? Yes; whereas the quantity given in the schedule is 12 yards. There must have been a clerical error there. Carter, Gummow, & Co. detected it, and took advantage of it—there is no doubt about that; and the question under the circumstances was, what had best be done?

12412.

- J. Davis. 12412. That is how the quantities come to differ. It was not that an increase of quantity was put in? No; it must have been an error. The pitching shown upon the drawings amounts to 32 square yards or thereabouts. Some of the manholes which are shown were not to be pitched. Mr. Hickson took advantage of that, and decided that only those which were shown should be fixed. Before the pitching was carried out, however, the works were passed over to Mr. Darley, and he appeared not to be aware of Mr. Hickson's decision. That is the reason why the quantity was increased from 32 to 38 yards.
12413. Then I understand that Mr. Hickson considered himself bound to the drawings, although the estimated quantity in the schedule was less, in error? Yes.
12414. Mr. Hickson refused to go any further than the drawings? Yes.
12415. And afterwards, somehow, the contractors were allowed to go further than the drawings? Yes. They got about 38 square yards, I think.
12416. No doubt you are right in saying that special bluestone concrete would have answered the purpose quite as well? Yes; although it might not have been quite as convenient for the contractors, because they put the pitchers in one day and use them the next. In the case of special concrete a certain time must be allowed for it to get hard.
12417. How long would they have to be protected? For eight days or so—not less than that. That would enable the concrete to harden. Another aspect of the case is this: The specification provides for the whole of the manholes to be pitched. The specification and drawings were at variance. Mr. Hickson took advantage of that in deciding that the drawings should be adhered to in this case, and not the specification.
12418. *Mr. Parkes.*] Can you tell me where the 38 yards of freestone pitching was to go to? That had to do with the culvert; it had nothing to do with the covers. It had to do with a culvert on the Illawarra Road. An alteration was made in that culvert during the progress of the work.
12419. The pitching was omitted,—it was not carried out? That had nothing whatever to do with the covers. It stands to reason that if you put sandstone pitching round the manholes you would have to renew them in a month's time.
12420. *His Honor.*] They would have to stand the wear and tear of the street? Yes.
12421. *Mr. Parkes.*] Will you show me from the plan where the bluestone pitchers go? Yes; I think you will find all the covers pitched in that way. I may mention that No. 1 is not pitched; it is on resumed land, and there would be no traffic over it. Mr. Griffiths, however, knows more of this matter than I do. I have explained it to the best of my knowledge.

George Christie recalled and further examined:—

- G. Christie. 12422. *Mr. Parkes.*] You have prepared some statements as to the papers concerning Contract 69. In the first place, you have prepared a memorandum showing the papers which have been omitted from the Parliamentary return? Yes, it is as follows:—

MEMO. No. 13.

As to additional papers referring to Contract 69.

(a) In the return furnished by the Department of Public Works to the Legislative Assembly in compliance with an order dated 10th October, 1895, the following important papers having reference to Contract 69 were omitted:—

| Registration No. | Date.               | Writer.  | Subject.  |
|------------------|---------------------|--|---|
| 93-1,446         | 4/11/93             | Holloway Brothers, Goulburn (Letter to Minister for Works)                             | "We are desirous of tendering for Contract No. 69, Sydney Sewerage, but the cash deposit stands in our way. We, therefore, ask if you cannot accept a less cash deposit in our case, say £1,000, and sureties for the balance? * * *" |
| 93-1,446         | 17/11/93            | Under Secretary (Letter to Holloway Brothers).   | The Minister cannot consent to any reduction in the cash security required.   |
| 95-153           | 29/5/95             | E. Hungerford (Memo. to J. M. Smail, Acting-Engineer-in-Chief, Metropolitan Sewerage). | Drawing attention to the necessity of obtaining Ministerial authority for the payment of contractor's claim in excess of the amount of the contract.  |
| 95-508           | 3/5/95<br>(3/6/95)? | J. M. Smail (Minute).....  | Recommending Ministerial sanction to an excess of £2,634 13s. 4d.   |
| 95-508           | 11/7/95             | C. W. Darley, Engineer-in-Chief, Metropolitan Sewerage Construction.                   | Requesting Ministerial sanction to an excess of £6,200. (This includes the above £2,634 13s. 4d.)   |
| 95-897           | 18/9/95             | E. M. Clark, M.P. (Letter to the Under Secretary for Public Works).                    | Urging extension of Carter, Gummow & Co.'s Contract (No. 69) at Marrickville.   |

(b) The following important papers bear dates subsequent to the order of Parliament:—

| Registration No. | Date.    | Writer.   | Subject.  |
|------------------|----------|---|---|
| 95-1,077         | 28/10/95 | C. W. Darley, Engineer-in-Chief, Metropolitan Sewerage Construction (Minute). | Requesting Ministerial sanction to a total excess payment of £9,100 (being £2,900 in excess of the £6,200).   |
| 96-836           | 27/2/96  | Same (Minute) .....   | Reporting completion of works, Contract 69, and recommending that penalties be remitted and final account (£9,100 above the estimate) paid in full. |
| 96-409           | 27/3/96  | Carter, Gummow, & Co. (Letter).   | Requesting refund of costs (£272 19s. 10d.) incurred in defending certain actions at law.   |

(c) The whole of the above papers are marked as registered in the departmental registers, and the entries appear in those registers and in the indexes thereto.

12/8/96.

GEO. C.  
12423.

12423. You have also prepared a memorandum with reference to the letting of Contract 69? Yes. It is as follows:—

G. Christie.  
12 Aug., 1896.

MEMO. No. 14.  
Re the letting of Contract 69.

(a) Tenders were originally advertised to close on 15/11/93 for the works, at an estimated cost of £78,162 18s. 2d. Consequent, however, on Mr. Hickson's minute of 7/11/93, the time was extended to 13/12/93. When the plans and specifications were finally submitted, the Department's estimate of the cost was £64,420 6s. 5d.

(b) Eleven tenders were received, of which Messrs. Carter, Gummow, & Co.'s was the lowest, at £45,207; the next lowest being that of Mr. John Ahearn, at £47,061. The report on the tenders, dated 14/12/93, appears on pages 66 to 69 of the Parliamentary return. In this Messrs. Carter, Gummow, & Co.'s tender was recommended for acceptance.

(c) The acceptance of Carter, Gummow, & Co.'s tender was notified by letter from the Under Secretary on 27/12/93. This letter contains two special conditions:—First, that the contractors are to accept funded stock in payment; and, second, that "the Secretary for Public Works is willing, in response to your verbal request, to accept two approved bondsmen, in the sum of £4,520, as security for the due performance by you of the contract." Though not specifically stated, these bonds for £4,520 were in lieu of the cash security (£2,260) which was required in terms of the specification. See on page 118, clause 29 of the general conditions, as follows:—

"29. Within fourteen days after the notice of the acceptance of his tender shall have been given to the contractor, or posted to the address of his last known place of business or residence, he shall deposit with the Minister, or at the option of the Minister in some bank or banks in Sydney, upon fixed deposit in the name of the Minister, a sum calculated at the rate of £5 for every £100 or part thereof on the amount of his tender up to the sum of £100,000, and at the rate of £1 for every £100 or part thereof, in addition, for any amount over that sum, to be held by the Minister as security for the due and proper performance and completion of this contract until the Engineer has certified that the whole of the work in the said contract has been completed to his satisfaction, or until this contract has been cancelled by the Minister under the power given to him in that respect under clause 32 of these conditions, in which last-mentioned event happening the money so deposited shall become forfeited to the Crown, and shall be held by the Colonial Treasurer, for and on behalf of Her Majesty the Queen, as liquidated damages. If, however, this contract shall not have been cancelled under the said clause, and if the works comprised in this contract are not completed within the time mentioned in clause 31 of these conditions, the liquidated damages which, under the last-mentioned clause, are made payable to the Minister, may be deducted and taken from the money so deposited."

(d) Messrs. Carter, Gummow, & Co. assented to the terms of acceptance of their tender by letter of same date, 27/12/93 (see page 81).  
GEO. C., 12/8/96.

12424. You have also prepared a statement as to acceptance of sureties in lieu of a cash deposit of £2,260 on Contract 69? Yes; it is as follows:—

MEMO. No. 15.  
As to the acceptance of sureties in lieu of a cash deposit of £2,260 on Contract 69.

(a) The security required by the general conditions (see clause 29 on page 118) was, on the amount of Carter, Gummow, & Co.'s tender, a cash deposit amounting to £2,260.

(b) Some seven weeks prior to the acceptance of Carter, Gummow, & Co.'s tender, in which the Department agreed to accept two approved bondsmen in lieu of the above cash security, Messrs. Holloway Bros.' letter, of 4/11/93, was submitted to Mr. Hickson, to the Board of Reference, and to the Minister. In their letter, that firm of contractors requested that the Department would accept a cash security of £1,000, and sureties for the balance. Mr. Hickson's minute is as follows:—"The cash deposit is in accordance with the revised general conditions, and I do not see my way to recommend a departure therefrom. As, however, there is no doubt that good contractors find it difficult, at the present time, to fulfil this obligation, it might be advisable to discuss the matter at the next meeting of the Board of Reference." The document is then marked "List to refer to Board. J.B., 7/11/93." Following which appears—"Submitted to Minister, Order No. 3,889, and marked by him as under:—"I do not think the deposit is too large for a contract that may cost from £80,000 to £100,000."—J.B."

Messrs. Holloway Bros. were informed accordingly, as follows:—  
93/1446 S.B.

17 November, 1893.

Gentlemen,

With reference to your letter of the 4th instant, in which you state that you are desirous of tendering for Contract No. 69, Sydney Sewerage, and ask whether, in the event of your being successful, a cash security of £1,000, in lieu of the specified sum of £3,900, would be accepted, I am directed to inform you that the Secretary for Public Works considers that in a contract of this magnitude the amount specified is not unreasonable, and he cannot, therefore, consent to any reduction.

I have, &c.,

J. BARLING,

Under Secretary.

(c) After the acceptance of Carter, Gummow, & Co.'s tender, they, on 8/1/94 (see page 82) in a letter as below addressed to the Under Secretary for Public Works, informed him that Messrs. Charles James Henty (of Parbury, Henty, & Co., merchants, Pitt-street) and Frederick Lassetter (of Lassetter & Co., George-street) were prepared to become the required sureties:—

CONTRACT No. 69.—WESTERN SUBURBS SEWERAGE.

Sir,

Box No. 10, North Sydney, 8 January, 1894.

With reference to the acceptance of sureties in lieu of the fixed deposit security for the above contract, we have the honor to inform you that Messrs. Charles James Henty, (of Parbury, Henty, & Co., merchants, Pitt-street) and Frederick Lassetter (of Messrs. Lassetter & Co., George-street, City) are prepared to become such sureties, and will sign any necessary documents in connection with the same when called upon to do so.

We are, &c.,

CARTER, GUMMOW, & CO.

The Under Secretary for Public Works.

Are names satisfactory? Commissioner for Roads.—D.C.M'L. (pro U.S.), B.C., 9/1/94. Yes.—R.H., 10/1/94.

Mr. Norrie.—D.C.M'L. (pro U.S.), 10/1/94.

On 29/1/94 (see page 121), Messrs. Carter, Gummow, & Co. wrote submitting the name of Mr. R. L. Scrutton in lieu of that of Mr. Lassetter, as follows:—

SURETIES—CONTRACT No. 69.—WESTERN SUBURBS SEWERAGE.

Sir,

Box No. 14, North Sydney, 29 January, 1894.

With reference to the above we have to inform you that Mr. Frederick Lassetter will be unable to sign the necessary documents in connection with the same, owing to his immediate and permanent removal to England.

We have, therefore, to ask you to be good enough to allow the name of Mr. Robert LeNeve Scrutton (of R. L. Scrutton & Co., merchants, City) to be substituted for that of Mr. Lassetter.

We are, &c.,

CARTER, GUMMOW, & CO.

Under Secretary for Public Works, Sydney.

Is name satisfactory?—D.C.M'L. (pro U.S.), B.C., 30/1/94. Commissioner for Roads. Yes.—R.R.P.H., 1/2/94.

Mr. Norrie.—D.C.M'L. (pro U.S.), 1/2/94.

(d) The minutes at foot of each of these letters show that they were referred to Mr. Hickson to report as to whether the proposed sureties were satisfactory, and in each case he replied, "Yes."

(e) Reference is again made to these sureties in the contractors' letter of 20/9/94 (see page 127). In this letter the contractors ask for the return of £1,000 of the retention money, and speak of their sureties as being the firms of Parbury, Henty, & Co. and R. L. Scrutton & Co. Mr. Davis, in his minute thereon, also refers to the sureties as follows:—" \* \* \* and the personal surety being Messrs. Henty & Co. and Mr. R. L. Scrutton (firms, I suppose, which are safe) \* \* \* " The security, however, given the Department was not that of the firms, but was the individual personal security of Mr. Henty and Mr. Scrutton.

(f) In the acceptance of these personal securities the usual declaration as to the possession of property to the amount of the bond was not obtained from either Mr. Henty or Mr. Scrutton.

GEO. C., 12/8/96.

12425.

G. Christie. 12425. You have prepared a return as to advances on material, and also as to the return of the retention money to Carter, Gummow, & Co., in connection with Contract 69? Yes, it is as follows:—  
12 Aug., 1896.

## MEMO. No. 16.

As to advances on material and return of retention money to Messrs. Carter, Gummow, & Co., Contract 69.

(a) On 27/3/94, an agreement was made in the name of the Minister for Works for advances up to £1,000 on material (see page 71 of printed papers). Advances were made to the contractors on cement to the extent of £450 at one time as follows:—

|                                     | £   | s. | d. |
|-------------------------------------|-----|----|----|
| In certificate No. 2, 16/3/94 ..... | 450 | 0  | 0  |
| "    3, 19/4/94 .....               | 450 | 0  | 0  |
| "    4, 22/5/94 .....               | 270 | 0  | 0  |
| "    8, 21/9/94 .....               | 337 | 10 | 0  |
| "    9, 23/10/94 .....              | 157 | 10 | 0  |

(b) On 20/9/94 (see page 127 of printed papers), the contractors applied to be paid £1,000 from the retention money. The request was granted, and from that time forth (namely, from certificate No. 8, 23/10/94, £31,161 3s. 5d.), the security required by the specification was deficient by £1,000. The final certificate is to 23/10/95, £54,320 7s. 7d.; so that the amount of work done after return of this retention money was £23,159 4s. 2d.

(c) In neither of these cases is there evidence that the advance on material or the return of the retention money was made with the sanction of the sureties.

(d) Following on the stoppage of the issue of funded stock, which is referred to in connection with Contract 79, at page 328 in the printed papers, the sureties were parties to a document under which the contractors agreed to accept either cash or funded stock in payment. This agreement appears on page 126 of the Parliamentary Return, and is now referred to as evidence that it was deemed necessary to have the sureties as parties to any alteration in the terms of the contract.

The agreement is as follows:—

Sir,

North Sydney, 6 July, 1894.

With reference to our Contract No. 69, Sydney Sewerage, we are willing that the Government shall exercise the option of paying us all sums now due or to accrue due in respect of this contract, either in cash or funded stock, as may be thought fit.

We have, &c.,

JOHN CARTER.  
FRANK MOORHOUSE GUMMOW  
(By his Attorney, JOHN CARTER).  
D. G. SNODGRASS.  
GEORGE MADDISON.  
PETER EWING.

Witness,—ROBERT MILLER, J.P.

We, the sureties named in the bond in connection with the above contract, consent hereto.

Witness,—FRED. WOOLCOTT-WALLEY, J.P.

CHAS. J. HENTY.  
R. L. SCRUTTON.

Treasury informed, 9/7/94. For approval.—J.B., 10/7/94. Approved.—W.J.L. Accountant, Roads, to note.—  
F.C.P., 24/7/94. Seen;—Mr. H. to note.—O.C., 24/7/94. Mr. Wallwork,—Please place with Bond Ct. 69.—  
E.H., 24/7/94.

12426. In your opinion, as a business man, would the return of that money affect the sureties in any way? Yes.

12427. You think it should not have been done? Not without their consent.

12428. You have also prepared a memorandum as to the excessive payments to Carter, Gummow, & Co., in connection with item 36 in the schedule of Contract 69? Yes; it is as follows:—

## MEMO. No. 17.

Re the excessive payments to Messrs. Carter, Gummow, & Co., in connection with item No. 36 in Schedule, Contract No. 69.

(a) Item 36 in Schedule is:—"Squared bluestone pitchers, in any situation, as specified in clause 17."

The office estimate was as follows:—

12 square yards at 30s. = £18. (See page 67.)

(b) The prices quoted by tenderers were as follows (see pages 67 to 69):—

|                            |                       |      |
|----------------------------|-----------------------|------|
| Carter, Gummow, & Co. .... | £50 per square yard = | £600 |
| John Ahern .....           | 15s.   "   =          | 9    |
| Kerle and Kerle .....      | 60s.   "   =          | 36   |
| H. McKenzie and Sons ..... | 20s.   "   =          | 12   |
| J. McSweeney .....         | 45s.   "   =          | 27   |
| Holloway Bros. ....        | 30s.   "   =          | 18   |
| J. F. Carson .....         | 20s.   "   =          | 12   |
| A. Dean and Sons .....     | 30s.   "   =          | 18   |
| Langtree and Owen.....     | 20s.   "   =          | 12   |
| Parry and Farley.....      | 20s.   "   =          | 12   |
| J. Stewart & Co. ....      | 30s.   "   =          | 18   |

(c) The actual payment to Carter, Gummow, & Co., under this item (No. 36 of Schedule) was as follows:—  
36½ square yards at £50 = £1,825. (See final certificate to 23/10/95.)

(d) Reference is made to this item in the schedule in Supervising-Engineer Davis's minute of 9/5/94. This minute points out that 35 square yards will be required, which at schedule rates would cost £1,750; whereas "special bluestone concrete," which would answer the same purpose, would only cost £22 10s. This would be a difference of £1,727 10s. The minute reads as follows:—

## MINUTE PAPER.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 9 May, 1894.

Subject:—Contract No. 69, Eastern Branch, Western Suburbs—Pitching round Man-hole Covers.

As some of the man-holes on this contract are being constructed, I should like the Engineer-in-Chief's decision as to the kind of pitching, if any, which is to be put round the man-hole covers.

Twelve square yards of squared bluestone pitching were included in the schedule of quantities, which the contractors have priced at £50 per square yard. The quantity likely to be used if the whole of the man-holes are to be pitched will be 35 square yards, which, at schedule rates, will amount to £1,750.

Special bluestone concrete will answer the same purpose as bluestone pitchers, and will only cost—9 cubic yards, at 50s.—£22 10s.

The fair price for bluestone pitching is about 25s. per square yard, and, as the schedule rate is so much higher than the market rate, the question arises whether the pitching should not be omitted. If, however, this course is considered to be unfair to the contractors, then only the quantity included in the schedule of quantities need be carried out.

J.D.

Mr. Hickson's minute thereon, and the recording by subordinate officers, reads as follows:—

We cannot in fairness omit an item for which, no doubt, the price is absurdly high, while we know that on other items the price is equally low. Where bluestone pitchers are shown on drawing, contractors must be paid for same at schedule rates.—R.R.P.H., 11/5/94.

Mr. Millner to note.—J.D., 11/5/94. Noted.—W.J.M., 14/5/94. Mr. Davis. File.—J.D., 15/5/94. (e)

(e) The Department's estimate of quantities, taken from the schedule, is 12 square yards. Mr. Hickson's minute G. Christie. practically authorises payment only for that quantity, which would have equally a cost of £600. There is no further written evidence of authorisation of the use of any additional quantity beyond the 12 square yards at this excessive rate of £50 per square yard, excepting that the officers signed the progress certificates. 12 Aug., 1896.

(f) These certificates show that the contractors were paid for bluestone pitchers under item 36 as follows —

| Date.    | Certificate No. | Quantity to date. | Amount. |    |    |
|----------|-----------------|-------------------|---------|----|----|
|          |                 |                   | £       | s. | d. |
| 23/7/94  | 6               | 5                 | 250     | 0  | 0  |
| 7/8/94   | 7               | 6                 | 300     | 0  | 0  |
| 21/9/94  | 8               | 9                 | 450     | 0  | 0  |
| 23/10/94 | 9               | 9                 | 450     | 0  | 0  |
| 19/11/94 | 10              | 9                 | 450     | 0  | 0  |
| 17/12/94 | 11              | 10                | 500     | 0  | 0  |
| 22/1/95  | 12              | 16                | 800     | 0  | 0  |
| 20/2/95  | 13              | 16                | 800     | 0  | 0  |
| 19/3/95  | 14              | 17                | 850     | 0  | 0  |
| 20/5/95  | 15              | 21                | 1,050   | 0  | 0  |
| 4/7/95   | 16              | 22                | 1,100   | 0  | 0  |
| 16/10/95 | 17              | 36·45             | 1,822   | 10 | 0  |
| 23/10/95 | Final.          | 36·50             | 1,825   | 0  | 0  |

(g) The above certificates were signed by the following officers, viz. :—Mr. Hickson, as head of Department, signed Nos. 6 to 14, inclusive; Mr. Bagge, as Chief Assistant Engineer, signed Nos. 6 to 13, inclusive; Mr. Davis, as Supervising Engineer, signed Nos. 6 to 14, inclusive; Mr. Griffiths, as Supervising Engineer, signed Nos. 15 to 17, inclusive; Mr. Milner, as Resident Engineer, signed Nos. 6 to 9 and 11 to 14, inclusive; Mr. Gibbes, as Resident Engineer, signed Nos. 15 to 17 and final certificate; Mr. Smail, as head of Department, signed No. 15; Mr. Darley, as head of Department, signed Nos. 16 and 17 and final certificate.

GEO. C.

12426. In conjunction with that report, I will ask you to read clauses 16 and 17 of the specification. You will find them upon page 116 of the Parliamentary papers? Yes—they are as follows:—

*Extra Works—Omissions of Works.*

16. If at any time whilst the works are in hand it shall be deemed expedient by the Engineer to order material or work of a different description to that specified, or to increase or diminish the dimensions or extent of any works to be done under this contract, or to alter their situation or vary the form or dimensions of any of the said works, or of any part thereof, or to make any deviation or to substitute one class of work for another, he shall have full power to do so, and to order and direct any such increase, diminution, alteration, deviation, or substitution: and the works involved in any such increase, alteration, deviation, or substitution, shall be executed by the contractor, if of the class of works provided for in the schedule of prices, at such schedule prices; and no such increase, diminution, alteration, deviation, or substitution of work, shall in any way annul or set aside this contract, or extend the time for the completion thereof, unless the Minister shall see fit to grant such extension; but such additions or alterations shall be measured and paid for, or deducted from the contractor's account, as the case may require, according to the schedule of prices. Provided that if any portion of the works so ordered to be done shall not be, in the opinion of the Engineer, of the same value or class of works provided for in the schedule of prices, the same shall be executed by the contractor at such prices as may be agreed upon with the Engineer; but, if the contractor and Engineer cannot agree as to the price to be paid, the Engineer may order and direct the same to be done by such person or persons as he may think fit. Before any extra work, or work of an altered value or class, is undertaken by the contractor, it shall be imperative for him to procure an order in writing from the Engineer for carrying out such extra or variation of work, and the contractor shall not be entitled to any payment for such extras or variations unless he produce the written order for the same, as aforesaid, and he shall not be entitled to plead that the Engineer omitted to give such written order, as it is to be distinctly understood that the onus of obtaining such order shall be on the contractor. The contractor shall not be entitled to any other rate than the schedule rate on any plea that the work was in a different position or of a different class from, or in a more difficult position than, that shown on plan or specification, or carried out under circumstances not contemplated in the specification, unless an agreement entitling him to payment by other than the schedule rates shall have been previously made and signed by the Engineer and the contractor.

*Valuation of Omissions.*

17. The Engineer shall have the power to direct the omission of the carrying out of any part or parts of the said works, but not amounting to the omission of the whole; and the value of such work so omitted in such case, calculated at the schedule rates, or, in the event of there being no schedule rates, calculated on the basis of the proportionate value which such work bears to the lump sum, as ascertained by the Engineer, whose decision on that point shall be final, shall be deducted from the contract sum, subject, however, to arbitration clauses Nos. 36 to 41.

12427. You have prepared a report having reference to the final certificate in Contract 69 exceeding the tender by £9,113? Yes; it is as follows:—

MEMO. NO. 18.

*Re the Final Certificate in Contract 69 exceeding the Tender by £9,113.*

THE aggregate amount of Messrs. Carter, Gummow, & Co.'s tender was £45,207 3s. 11d. The amount of the final certificate was, however, £54,320 7s. 7d., being an additional sum of £9,113 3s. 8d.

The departmental records having reference to the reporting of this excess to the Minister, from time to time, were not included in the papers laid before Parliament. From these records (which are enumerated in Memo. 13), it would appear that three separate applications were made for Ministerial sanction, viz. :—

On 4/6/95, to pass £2,634 13s. 4d.

On 12/7/95, to pass an increased amount, making the total £6,162 16s. 1d.

And on 29/10/95 (after the date of the Parliamentary Return), to pass a further increased amount, to make a total in all of £9,100.

The reasons stated in the various applications for the Minister's sanction are that the excess on the original estimate was due to the ground turning out different to what was contemplated.

GEO. C.

12428. *Mr. Davis.*] As to the retention money. Will you turn to page 120 of the Parliamentary return and read the last paragraph of clause 34? Yes; it says, "The like liability also shall hold as to the obligation of the contractor in the event of any advance being made to him from the retention money or on material on the ground and not *in situ*."

12429. What would you conclude from that—would you not conclude that the return of retention money together with an advance of material on the ground is contemplated? Yes; provision appears to be made for that.

12430. So that supposing the retention money were returned, and that an advance were made on material, that would not nullify the contract? I have not said that it would do so.

12431. Will you now turn to page 118 and read clause 27? Yes; it is as follows:—

*Conditions not to be waived.*

27. None of the conditions of this contract shall be varied, waived, and discharged, or released either at law or in equity, unless by the express consent of the Minister, testified in writing under his hand.

12432.

G. Christie. 12432. It would therefore appear that, even supposing the return of the retention money were not contemplated in the contract at all, and an advance were made on material, and sureties accepted in lieu of cash deposit, the Minister under his hand has power to waive the contract in any respect? That clause supports the contention that any alteration should have had Ministerial sanction, which does not appear.

12 Aug., 1896.

12433. To what do you now refer when you say that there was no Ministerial sanction? I mean Ministerial sanction to the consent of the sureties to the withdrawal of the retention money.

12434. But confine yourself to Ministerial authority—to what do you refer when you say that Ministerial authority was not given? To the authority allowing the sureties to approve of the withdrawal. You cannot show me, I think, any document where the Minister has approved of the sureties agreeing to the withdrawal of any of the retention money or to anything else of that kind.

12435. But has not the Minister absolute power to alter the conditions of the contract without any reference whatever to the sureties? No; I do not think so.

12436. Not under that clause? Certainly not.

12437. Coming to Holloway Bros.' letter, do you observe that that decision as to the request which Holloway Bros. made as to the acceptance of sureties in lieu of cash deposit is dated before it was decided to pay for the work upon Contract 69 by funded stock? I should say that if there were to be any alteration all the tenderers should have been informed. Holloway Bros. with the rest should have been informed of that alteration.

12438. But was there any alteration before the tenders were received? I am not aware of any.

12439. So that Holloway Bros.' case stands quite by itself, before the tenders were received? No. What I should say is this—that you altered the conditions of tendering without informing the whole of the tenderers.

12440. What I want to know is whether it is not a fact that Holloway Bros. sent in their letter before the tenders were received? When the first advertisement appeared.

12441. Have you found anything in the papers at all antagonistic to the decision arrived at with regard to Holloway Bros.' case before the tenders were received? I find this: that Holloway Bros. were refused a concession which Carter, Gummow, & Co. subsequently received, for what reason I am not prepared to say.

12442. That is not an answer to my question. I want to know whether there was any variation of the conditions of tendering before the receipt of the tenders. Were not all the tenderers treated precisely alike. Did they not all pay preliminary deposits? It seems to me that up to the time of receiving the tenders they were all treated alike. They all tendered upon the one condition.

12443. In spite of the decision of the Minister, Holloway Bros. put in a tender for this particular work? Yes; understanding that no one could get such a concession as that for which they had asked.

12444. That is your own conclusion? Yes.

12445. Coming now to the next point—have you not gathered from the papers that the reason why sureties were accepted in Carter, Gummow, & Co.'s case, and also in connection with similar contracts, was that they requested to be paid by Funded Stock? What I gather from the papers is this—that the Department wanted to make certain conditions with Carter, Gummow, & Co. They accepted the contract, taking it, I suppose, that it was to their own interest to do so, and they then got other concessions. The concession in favour of the Department does not amount to much as regards the Funded Stock. Even supposing they sold at 2 per cent. discount, it would not amount to a very large sum of money.

12446. *Mr. Norrie.*] Not 2 per cent. upon £45,000? The security should not be jeopardised even for 2 per cent.; but we know what was done in that matter. The loss did not amount to much.

12447. *Mr. Davis.*] Will you now read paper No. 2 on page 6? Yes; it is as follows:—

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 7 November, 1893.

*Minute Paper.*

*Subject: Main Eastern Branch Sewer.*

I FIND it will be quite impossible to be ready for inviting tenders for this work on the 15th instant. Specifications and plans on which tenders were to be invited are over two years old, and since that time considerable modifications and alterations in our sewerage plans have been suggested. The work is of too important a nature to rush through without full consideration. I therefore recommend that the time for the receipt of tenders be postponed till 13th December.

ROBT. HICKSON.

Extend time.—J.B., 7/11/93. Mr. Mitchell. Noted, *Gazette* and papers.—7/11/93. Approved.—W.J.L., 14/11/93. Roads.—D.C.M'L. (*pro* U.S.), B.C., 15/11/93.

PUBLIC WORKS DEPARTMENT.—SEWERAGE BRANCH.

Construction of Eastern Main Branch Sewer, Western Suburbs Sewerage.—Contract No. 69, Sydney Sewerage Works.

HEREWITH is submitted for the approval of the Commissioner and Engineer-in-Chief, plans and specifications, in triplicate, for the above work.

Amount available, provided for in vote, £830,000, for Western Suburbs Drainage, Loans Act, 53 Vic. No. 23.

Estimated cost—£64,420 6s. 5d.

Plans and specifications to be exhibited at the Sewerage Office, Public Works Department.

Tenders to close at 11 a.m., Wednesday, 13th December, 1893,

The Commissioner and Engineer-in-Chief.

C. H. OHLFSEN BAGGÉ,  
Chief Assistant Engineer for Sewerage.

HEREWITH is forwarded for the approval of the Secretary for Public Works, and for insertion in the *Government Gazette* and local papers, an advertisement inviting tenders for the above.

The Under Secretary, B.C.

ROBT. HICKSON,  
Commissioner and Engineer-in-Chief for Sewerage.

Department of Public Works, Roads and Bridges Branch, Sydney, November, 1893.

TENDERS will be received up to 11 o'clock a.m. on Wednesday, 13th December, 1893, for the construction of Eastern Main Branch Sewer, Western Suburbs Sewerage Works, Contract No. 69, Sydney Sewerage.

Tenders to be addressed to the Sewerage Office, Sydney, where specifications, &c., may be seen.

12448. It would appear from that that Mr. Hickson seemed very anxious that the very best should be done in respect to that particular contract? It is shown that a week before that he wrote a minute in connection with the tendering upon the old plan. I do not think he is entitled to any credit at all in the matter, because he ought not to have submitted the first plan. 12449.



12449. *Mr. Carter.*] Having noticed that the tenders in the first instance were based upon cash payments, and that an arrangement was afterwards made under which we were paid in funded stock, do you not think it would have been a fair thing to put that in your report? I have no wish to be at all unfair; I think I have been absolutely fair in the matter. I stated that there were special conditions. The papers are there, and speak for themselves. G. Christie.  
12 Aug., 1896.

12450. But knowing that the circumstances were as I now state them, do you not think it would have been fair to mention it in your report? I have mentioned it.

12451. Will you read the paragraph? Yes. I say, "The acceptance of Carter, Gummow, & Co's. tender was notified by letter from the Under Secretary, on 27th December, 1893. This letter contains two special conditions—first, that the contractors are to accept funded stock in payment, and, second, that the Secretary for Public Works is willing, in response to your verbal request, to accept two approved bondsmen in the sum of £4,520."

12452. Is that a fair way of putting it? I thought so.

12453. *Mr. Parkes.*] Mr. Davis has asked you to read various clauses of the specification. I will now ask you to read clause 30, of page 119, of the Parliamentary return? Yes. It is as follows:—

*Payments.*

30. Progress payments may be made once in every month, unless the same shall become not payable by reason of anything contained in these conditions, on the certificate of the Engineer, as the work proceeds, in the proportion of 80 per cent. of the value of the work returned, until the sum retained reaches the amount of the deposit provided for in the preceding clause, when no further deductions will be made. The amount of the retention money will be held by the Minister, in addition to the cash security, unless otherwise provided for in the specification, until the Engineer has certified that the whole of the works have been satisfactorily completed, and the period specified for the maintenance of the said works has expired, and all accounts finally adjusted; when the retention money, in addition to the cash security, will be paid to the contractor; and it is expressly declared that until a certificate has been given by the Engineer to the Minister that the work done by the contractor has been executed and completed to his satisfaction the contractor shall have no right or claim in respect of any work done or materials provided, nor to the payments from time to time to be made under this contract, or to the final payment upon the whole of the works being finished.

Thomas Griffiths recalled and further examined:—

12454. *Mr. Parkes.*] Were you in charge of Contract 69 as Supervising Engineer? Yes, for part of the time. T. Griffiths.  
12 Aug., 1896.

12455. For what portion of the time? From early in April, 1895.

12456. Could you tell me on what date all the tunnel excavation was completed on Contract 69? No.

12457. Was it finished before April? Yes.

12458. Then as to the certificate which was paid upon 4th April, and which showed in connection with the tunnel work 13,294 cubic yards of excavation, how could that be increased between that date and the date of the final certificate by over 1,000 yards? I presume that the first voucher you refer to would be a progress voucher. We never measure up exactly for progress vouchers. They merely represent the payment of something on account. The final voucher would give the adjusted account. May I also say that all the final vouchers are afterwards checked in the office.

12459. Would the item of 14,373 yards be the total of the excavation? I could not say from memory.

12460. Will you now turn to page 76 of the Parliamentary papers, and look at the items 5 to 11, at 27s. 6d.;—there would be an excess on that excavation of something like 4,900 yards? Yes.

12461. How was that made up? That was before my time. I had nothing to do with that.

12462. Then only Mr. Davis can give us evidence on that point? Yes.

12463. Turn now to the item of £50 for bluestone pitchers; can you give us any particulars in regard to that? No; I do not think I can, further than this: that they were fixed according to the plan.

12464. Will you take the site plan and point out where they are situated? There are no pitchers at shaft No. 1; it is on resumed land. With the exception of a shaft in, I think, Sydenham Road the whole of the remaining shafts have pitchers. There would be altogether, I think, about thirty-four.

12465. What is the size of the manhole covers? When the cover is open for a man to get down it is about 22 inches across.

12466. What is the rim? That would make it wider, of course.

12467. What about the bluestone round it—that is about 4 inches? No; it is 9 inches wide.

12468. I presume that in the total of these manholes there would be about 12 yards of bluestone pitching? There would be 1.23 yards to each manhole.

12469. That would not come to the total of 38 yards? It all depends upon the number. If there were, say, thirty-four manholes, I should say that it would come to 38 yards, because there is over a yard to each manhole.

12470. Does the price not appear to you to be enormous? Yes, it does.

12471. In adjusting the contract when paying the final voucher, do you not think it would have been a fair thing to give an equitable figure for any excess quantity not provided for in the contract? I saw it was a big price, but I saw also that in some cases we had exceeded the office estimate upon items where Carter, Gummow, & Co. had very low prices. In timber, for instance, I think the item ran into nearly 1,000 feet more than the office estimate. The price they had was 1d. per cubic foot.

12472. How did there come to be that 1,000 feet more? I am speaking from memory. I think the estimate was 9,000 cubic feet at 1d., and we actually used and paid for 9,818. I think we paid about £40, and the timber would have been worth from £1,200 to £1,500.

12473. What about the excavation in the shafts? So far as excavation is concerned, if you look at the excavation in the road surfaces you will find that they had 9d. a yard, and I think the work would cost about 3s. 6d.

12474. They anticipated that, I presume? I do not suppose they expected to lose 2s. 9d. per yard.

12475. You did not do as much of road surface excavation as is given in the schedule, did you? Very nearly; there is only the difference between 19,230 and 19,320 yards. I may mention that the excavation I supervised was in connection with the syphon.

12476. The certificate which you signed in April would be the first certificate you signed? Yes; I know nothing about the work prior to that.

12477. As to the shaft at Premier-street, the ironwork was done away with, was it not? There was an altered design there; but there is, nevertheless, a lot of ironwork fixed in the Premier-street shaft.

- T. Griffiths.  
12 Aug., 1896.
12478. But, as regards the top of the shaft, it was not left open with an iron hand-rail round it? No.
12479. But you will notice that that ironwork is paid for in item 73? Yes; the ironwork was on the ground before the Department had definitely decided what it would do.
12480. What became of the ironwork? It is stored at our depôt at Liberty-street, Newtown. I saw it a few days ago.
12481. But fixing is included in the item to which I refer? I cannot speak as to that from memory.
12482. Does not the schedule say "providing and fixing"? I expect so. As a matter of fact, there is not much work in fixing, and the iron had to be carted from 2 or 3 miles away. I suppose the carting would almost cover the cost of fixing.
12483. Would it be part of the £50 which was supposed to be saved. I could not say.
12484. Was the sewer rendered throughout? No.
12485. What portions were not rendered? The arch was not rendered.
12486. Do you know what became of the material from the excavation which was not used in packing? As I have said, until that part of the work was almost finished, I had nothing to do with that contract.
12487. The material had been disposed of before you went there? Yes; I think the municipality took a great deal of it.
12488. Is the section of the single sewer which was substituted for the double sewer the largest section of sewer in this work? Yes.
12489. Eight by seven, therefore, would be the largest section? Yes.
12490. How far does that run? To the Illawarra Road—about 8 chains, I think.
12491. What is the next section? That is not constructed.
12492. What is the size of the northern branch? 5 ft. 6 in. by 4 ft. 6 in.
12493. And what is the size of the eastern branch? 6 ft. 8 in. by 5 ft. 8 in.
12494. What is the smallest sized sewer upon the contract? 4 ft. 6 in. by 3 ft. 6 in.
12495. Was Mr. Millner the officer who preceded you? I took Mr. Davis's place.
12496. *His Honor.*] Was there any question for Mr. Darley to settle as to the substitution of concrete for bluestone pitchers round some of the shafts where bluestone pitchers were not shown on the drawing? No, I think not. I can only remember one case where there was none, and that was on resumed land, where there would be no necessity for pitching.
12497. *Mr. Parkes.*] Where was all the freestone pitching to go? It was to go round the top of the shaft in the original design. There was a sort of coping to the shaft, and the railings had to be let into it.
12498. There were 38 yards, we are told? It must have been a contingent item, I think.
12499. *His Honor.*] What was used at Premier-street? That is on land which is not occupied. There was no necessity to put any pitchers there, because there is no traffic, the surface being grassed.
12500. *Mr. Parkes.*] Was Mr. Gibbs upon this job all through? No; only during the time I was on it.
12501. *Mr. Davis.*] You have had a good deal of experience in connection with tendering since you have been in the colony? Yes; under the Water and Sewerage Board.
12502. What, briefly, has been your experience as to the way in which contractors have sent in their schedules? Well, they have sent them in in various ways, and at last it got to be so bad that we had to alter the system.
12503. What was so bad? The method of tendering. In one case, for instance, we had rock at  $\frac{1}{4}$ d. a yard in excavation, and I think, in the same tender, the soil was given at 10s.
12504. *His Honor.*] Whose tender was that? That was at the Glebe. In another case we had the same items at 2d. and 3d. a yard, and at 9s. 6d. The tenders were those of Williams & Co. and Butcher Bros.
12505. *Mr. Davis.*] The rigging of the tenders got to be so bad that after you had tried several ways of checkmating the contractors, you had, finally, to alter the whole system? Yes; we altered it about the same time that you made an alteration. I think that, if anything, we might have been a contract or so before you.
12506. The object of altering the system of tendering was to do away with speculative prices? Yes; to prevent the rigging of the schedules.
12507. Did the Board allow any of the tenders to be altered after they were received? No.
12508. They were either accepted or not? Yes; the lowest tender was accepted—in fact, I cannot think of a single case in which it was not accepted.
12509. You did not reject a tender because the prices were in some instances absurdly low, and in some instances absurdly high, without any apparent reason? No; each tender would be reported on, the schedule would be examined, and the lump sum would be noted against each name. The tender which happened to come out the lowest would be recommended for acceptance.
12510. Were all the tenders you received from contractors affected to a greater or lesser degree in the way you have described? Not at first, but latterly they nearly all seemed to get into one groove and acted accordingly.
12511. You had some experience before you came to the Colony in connection with contracting? Yes; in Wales. I was a contractor's engineer there for ten years.
12512. Do you know whether the same practice was in vogue there among contractors? Yes; as far as I can see it seems to be about the same all the world over.
12513. Can you give His Honor any instances from your own experience? It is rather difficult to remember them at a moment's notice, but I do remember one case which affords a very good illustration. It was the last contract of which I had charge in the old country. We had to construct a large reservoir for the Cardiff Corporation. The first item in the schedule was clearing the site of the reservoir of all vegetation. It was clearly specified, and to the best of my knowledge—I will not swear to it—we put down a sum of £5,000, the work being honestly worth about £500. I might say, in explanation, that we had about £20,000 worth of plant on the ground and we had also to deposit 10 per cent. on our tender of £100,000, so that there was ample security as far as the Cardiff Corporation were concerned. Another instance I remember was in connection with the waterworks we constructed at Aberavon. In that case we had local knowledge which other persons had not. We knew of a site for a puddle-field right alongside the work, that is—within 200 yards of the embankment. We put in a good price for that item because we knew that everyone else thought that the puddle would have to be brought from 6 or 7 miles away. The land, as is generally the case where waterworks are constructed, was pretty hilly, and it would be supposed, as a consequence, that the cartage would be very heavy. I think we got something like 5s. 6d. per yard for puddle, whereas it cost us about 1s. 2d.

12514. In other words, your principals had knowledge which other contractors had not, and they turned that knowledge to account? Yes. I know of one firm in particular who spent hundreds of pounds in preparing their tenders. They sent a man to explore the country for weeks, with the object of preparing a tender to the best advantage. T. Griffiths.  
12 Aug., 1896.

12515. *Mr. Carter.*] Taking into consideration the fact that Contract 69 was finished entirely to your satisfaction, as far as workmanship is concerned, could you possibly object to paying us upon the items in the schedule? No.

12516. Have you known such a thing to be done anywhere? No; not when once the tender has been accepted.

12517. Referring to the bluestone pitchers, are you sure that no more than the actual number shown upon the plan had been paid for? I am certain of that.

12518. As to the fixing of the ironwork in the Premier-street shaft, from 10s. to £1 would be a fair thing to allow, I suppose? Yes. It seemed a light bit of work, and the cartage to the dépôt would about cover it.

12519. *Mr. Parkes.*] Do you not see clearly that if you had carried out the conditions of your own contract, and had abided by your own schedule, these things could not have occurred? I did not prepare the schedule.

12520. But at the heading of your quantities you have these words, "probable quantities." Why cannot you fix something fairly approximate instead of, for instance, subsequently altering the quantities, and substituting blasting for guttering and gadding, and that kind of thing—why not prepare the work more accurately in the first instance? I had nothing to do with that.

12521. If that were done, would it not prevent the rigging of the schedules? You cannot foresee everything in works of this kind.

12522. Take the schedule for Contract 79, do you not think that as regards the guttering and gadding it is framed in such a way as to invite contractors to rig their schedules? I do not see that. When a man prepares his tender he puts so much on or takes so much off the Departmental rate.

12523. But the percentage system will not help you in the matter. You ought to fix your quantities in some approximation to the work which you are going to carry out. If you are going to gutter and gad then gutter and gad; if you are going to blast, then blast? You cannot foresee the exact quantities in public works of this kind.

12524. But some contracts show that you can do so. In Contract 69 you had a clause allowing you to substitute one material for another, leaving it open to any contractor to get the best of you? I do not look at the matter in that light. I should like to know in what way the contractors could get the best of us from the existence of that clause.

12525. An engineer who makes up a schedule has it in his power to prevent contractors from rigging their tenders, has he not? We do our best, of course.

12526. But is it not in the power of an engineer to prevent the rigging of tenders? It does not matter what engineer happens to prepare a contract, you will find that contractors will rig their schedules.

12527. Could not a conscientious engineer save the State money? I could not have saved a penny in this case; I looked after the work to the best of my knowledge.

12528. *His Honor.*] Had you anything to do with the acceptance of tenders? No.

12529. Can you say whether if a tender were drawn up, as Mr Parkes suggests, containing prices more absurd—four or five times as absurd if you like—than £50 a yard for bluestone pitching, it would be the regular custom to throw that tender out? I do not know what has been the practice with the Public Works Department. I had nothing to do with it in any shape or form up to twelve months ago.

12530. You have had nothing to do with the accepting or rejecting of tenders anywhere else? No; except, as I have explained, that I was a contractor's engineer for ten years.

12531. You are only speaking from your experience on the contracting side—not on the accepting side? Yes; I have given you instances of how contractors at home rig their schedules. I know, from my own experience, that the prices put in are sometimes absurd. I know that, in connection with the Board of Water Supply and Sewerage, the prices received were sometimes absurd. I have given you instances of that already.

12532. But the question is, what extent of absurdity in price would justify the rejection of a tender? That is a matter for the Board to say. The matter was usually sent on to Mr. Smal, and it would be for him to make a recommendation.

12533. Have you ever known a tender to be thrown out for what may be called a superfluity of absurdity in rigging? No.

12534. *Mr. Parkes.*] In the case to which you have referred, where the price of a farthing a yard for excavation in rock was given, was any distinction drawn in the schedule between the excavation in hard and soft material? Yes; there were so many yards of rock and so many yards of soil.

12535. Were bores taken? We take no bores under the Board of Water Supply and Sewerage. We have comparatively shallow trenching. The contractors have to satisfy themselves as to the nature of the ground through which they go.

12536. They have to do that, you say? Yes. You will find that one man will have better local knowledge than another, and will rig his tender accordingly. The Glebe contract was one in point. There the tenderer had better local knowledge than had the Board's officer.

12537. You throw on to the contractor the responsibility of finding out the nature of the ground? Yes. Under the new system we tell them what we consider a fair price, and they put in a percentage above or below.

12538. If payments were allowed to be made upon specially selected items, as in the case of Contract 69, percentage tendering would not help you? In that case we should not put down a price of £50 a square yard for bluestone pitchers.

12539. But you are liable to make mistakes? Yes, but not absurd mistakes.

12540. Take Contracts 117 and No. 77—two contracts right against one another. You have put down excavation at £3 10s. in one case, and £1 18s. in the other? I did not put down those prices. I am not in any way responsible for them.

12541. After all does it not rest with an engineer to control the matter to see that work is carried out at a fair and reasonable rate? Yes.

12542. There is no doubt about that? No.

12543.

- T. Griffiths. 12543. If a tender is accepted, the work is presumed to be done for a certain amount of money;—there may be a little increase in quantities, but suppose there is an increase of 30 per cent., what would you say to that? You can never estimate the exact quantities in any public work when completed.
12544. But you ought to be prepared to go fairly and reasonably near the quantities? It all depends upon what you call reasonably near. I have had twenty years' experience in such matters, and I should be sorry to say that I could give the exact quantities that would be required in any work when completed.
12545. How is it that engineers outside of the Department can do so? I have never known a man outside of the Department to do so. Take the Manchester Ship Canal. Some of the best engineers in England estimated the Manchester Ship Canal to cost from 6 to 8 millions, whereas it cost from 13 to 14 millions. If men of that stamp can make mistakes, surely smaller fry may be expected to do so.
12546. But that would be in connection with water;—the engineers would have to deal with water coming in upon them? Yes. Take also the Panama Canal; that has ruined thousands of persons, although they have had the advice of De Lesseps and some of the most eminent engineers in the world.
12547. *His Honor.*] Is this your first experience of what you call percentage tendering? Yes; it has been in operation under the Board of Water Supply and Sewerage for about two years.
12548. Who started the idea first of all? I have an idea that it emanated from the Tender Board and Mr. Smail. I think Mr. Smail had something to do with it. I think the Board's tenders were first advertised in that way.
12549. You have not heard of the system in any other part of the world? No.
12550. From your experience as an engineer, what do you say about its expediency, as compared with the old schedule form of tendering? I think it prevents, to some extent, the rigging of schedules.
12551. You think it is an improvement? I think so. Of course, if I were speaking from the point of view of a contractor's engineer, I should probably say that it was not an improvement.
12552. But speaking from the public point of view? From that point of view, of course, it is an improvement.
12553. Was the system formerly adopted by the Works Department—the schedule system—generally adopted all over the world? Yes. In the old country, in the case of large contracts, the schedules are prepared, not by the engineer himself, but by a quantity surveyor. The surveyor would charge about 5 guineas for a schedule of quantities. The quantities are prepared to the best of the man's knowledge, and when the tender is accepted he gets a fee according to the size of the job. The contractor then fills in his prices. Each contractor can get a copy of the quantities by paying for it.
12554. Each tenderer tenders upon that schedule? Yes; that is the universal practice in the old country upon all big works.
12555. It has developed a system as remarkable for the rigging of schedules almost as that said to be adopted by solicitors in the making out of their bills of costs—possibly, even worse? Yes.
12556. You think, then, that the Department have now made a good departure? I think the present system is as near perfection as possible.
12557. *Mr. Carter.*] I suppose you know that outside of the Public Works Department all private engineer's work is carried out on the lump sum system? I cannot speak as to the outside practice.
12558. *Mr. Davis.*] Did it ever come to your knowledge that Mr. Hickson, as an official member of the Water and Sewerage Board, proposed the present system? I think that is how it came about; I think it was done through Mr. Hickson. I believe Mr. Smail recommended it to the Water and Sewerage Board, and I know that I received instructions to get all other tenders out in that form.
12559. You think that the idea may have originated with Mr. Hickson himself? I do not know; but I am pretty well certain that it came from Mr. Hickson and Mr. Smail. I do not know who originated it. I think the Board were the first to prepare a contract under the new system.
12560. *Mr. Parkes.*] Was the recommendation to which you refer in writing? I do not know for certain, but I believe the system was mentioned to Mr. Smail by Mr. Hickson. I remember Mr. Smail saying, "You see what a difficulty we are having with our tenders; it would be much better to have a system under which the contractors can tender at a percentage off or on."
12561. *His Honor.*] Had there been much talk in the Department about the rigging of tenders? Yes; Mr. Smail and I had had many chats about the matter.

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FRIDAY, 14 AUGUST, 1896.

John Charleton Graham sworn and examined :—

- J. C. Graham. 12562. *Mr. Parkes.*] You work for Carter, Gummow, & Co.? Yes.
12563. Have you been working long with them? Eight or nine months.
- 14 Aug., 1896. 12564. Upon what works? None in particular. I have been doing anything they gave me to do.
12565. On what jobs have you been? On the Johnstone's Creek aqueduct from the Lillie Bridge side to the White's Creek side.
12566. Did you work on the aqueduct part of the contract? You mean on the arches—yes.
12567. Were you working there in January, 1896? I believe I was.
12568. Do you recollect on what part of the work you were then engaged? No.
12569. Were you then working on Contract 77 or on Contract 118? I do not know the numbers of the contracts, and I could not say for certain where I was working at that particular time.
12570. Where were you working generally? I did everything which was given me to do—pick and shovel work, or anything that was going.
12571. Were you concrete mixing? I sometimes did a little bit of that; at other times I was muck-shifting, and at other times wheeling the barrow.
12572. Have you done much concrete mixing? A good bit, off and on.
12573. Before you came to Carter, Gummow, & Co., had you done much concrete mixing? No.
12574. What quantity is it that is called a batch? I could not tell you; I never filled the boxes.
12575. Is a box-full a batch? I could not say. All I had to do with the concrete was to turn it over.
12576. How much stone goes to a batch? I could not tell you.
12577. Did you never hear the term used? No; I had nothing to do with the filling of the boxes, but I did the turning over sometimes. 12578.

J. C. Graham.

14 Aug., 1896.

12578. Were you engaged in concrete work in last June or July? I could not say.
12579. Do you remember what work you were then doing;—I mean in June and July of the present year? I could not say.
12580. Could you tell me the names of the men who worked at the concrete work on Carter, Gummow, & Co.'s jobs upon which you have been engaged? I do not know their proper names. I only know them by their nicknames, by the names by which they went on the job.
12581. Could you tell me some of them? It would be hard to do that.
12582. But you must surely remember the names of some of the men who are doing concrete work when you were mixing the concrete? There were so many of them.
12583. But tell us the names of some of them? Martin Byrnes was one of the men on the board. There was also a man they called Scroucher.
12584. Where is he working now? He was working over at White's Creek yesterday.
12585. He is still on the works? Yes.
12586. Can you give us the names of any of the others? There would be myself and Jack Kerwick. Those are all the names I can remember.
12587. Are all the men who are working on Contract 77 in June, still working there—I mean the men who were then doing concrete work? I think so as far as my knowledge goes.
12588. They have worked at it since June? I could not tell you.
12589. Did you do any of the concrete work at all in the case of the Johnstone's Creek aqueduct apart from concrete mixing? I was on the board throwing it on to the boards at the top, as it were.
12590. When you used bag cement on this job was it carried to the work in a cask? I never saw any bag cement used.
12591. Was no bag cement used on the job? Not to my knowledge.
12592. Is there any in the shed? There is some in the shed.
12593. How much? I could not tell you.
12594. Is there any cask cement there? There was some there.
12595. Is there any there now? I could not tell you that.
12596. Who was the inspector on the job? Clymer.
12597. Who is the foreman? Jack Cottle.
12598. Is Bandeen a foreman? He was.
12599. He is not on the job now? No.
12600. Where is he now? I could not tell you.
12601. Where did you last do any cement work upon the storm-water channel? That must have been before last Christmas.
12602. Do you remember when you came to Carter, Gummow, & Co.'s contract? Yes.
12603. On what date was that? I could not say to a certainty.
12604. About what month of last year was it? I think it must have been last October.
12605. What was your work then? I was wheeling metal.
12606. What sort of metal? White metal.
12607. Do you know where it came from? No.
12608. Did it come from a crusher? I could not tell you.
12609. Did you wheel it from a heap? Yes; it was a bit too far to shovel; we had to wheel it.
12610. Where was the board? On the ground.
12611. In what position was it in relation to the contract? It was about ten yards away.
12612. Who brought it down to the board? A carter.
12613. Who was it? I could not tell you.
12614. Do you not remember his name? No; I knew no one when I went on to the job. I could tell you the name of hardly anyone on the job for a certainty.
12615. Do you know whether the carter brought the stone from a crusher? That I could not tell you.
12616. How far away would the shed containing the cement be from where you were working when you were mixing the concrete? Sometimes it would be a quarter of a mile, and in other places, say, 50 yards.
12617. The cement would be carted to you? Yes.
12618. In casks? Yes; the casks were all branded.
12619. Do you know where the sand came from;—do you know anything about the sand? I could not tell you that.
12620. You do not know whether it was crushed sand-stone or not? No.
12621. Can you tell me whether Contract 118 is yet completed? I do not know whether you would call it completed, but there is no one working on it.
12622. When did they cease to work there? I could not tell you.
12623. Do you recollect when you last worked upon it recently? The last time I worked upon it was in connection with the flood-gates.
12624. On what date did they finish those? That I could not tell you.
12625. You cannot even remember the month? No.
12626. *Mr. Carter.*] Mr. Parkes has asked you a lot of questions regarding your duties on our contracts. As a matter of fact you were a general workman. You would be here to-day and at some other place to-morrow? Yes.
12627. You were on the concrete board when there was a vacancy and at other times you would be on the scaffolding or wheeling metal or doing anything that was necessary. You had no stated work? That is so.
12628. You were not a regular concrete hand? No.
12629. *His Honor.*] Was the stone you have spoken of stone which was ready broken when it was brought down? Yes.
12630. Broken for going into the concrete? Yes. If it was in any way large the inspector would have it broken with a little hammer.
12631. He would go over it? Yes. He would rake it over and if there were any big lumps in it he would have them broken. The inspector was always on the board, to my knowledge.

John Driscoll sworn and examined :—

- J. Driscoll.  
14 Aug., 1896.
12632. *Mr. Parkes.*] You work for Carter, Gummow, & Co.? Yes.  
12633. How long have you worked for them? About ten years, I think.  
12634. You have lately been working on the aqueduct contract? No.  
12635. Did you work in the storm-water channel? Yes; I was putting in concrete.  
12636. Were you doing that continuously? Yes.  
12637. When was the last concrete put into that work? I could not tell you.  
12638. Was any concrete put into it in June last? I could not say.  
12639. Was there any put in in March? I could not say.  
12640. *His Honor.*] You know, I suppose, about how long ago concrete work would be done there? No; I never took any interest in it.  
12641. *Mr. Parkes.*] How long ago is it since you were at work there putting in concrete? About six months ago.  
12642. Did you recollect when the concrete work was completed upon Contract 118? Yes.  
12643. When was it? I could not say when exactly.  
12644. Was the cement brought down to you? I had nothing to do with the cement. I had to put concrete in the ribs.  
12645. Did you mix the concrete? No; I never turned a shovelful of concrete.  
12646. Can you tell His Honor the names of some of the men who mixed the concrete there? No; I was a chain or two away from them, and I never went to the board. The men on the board would have to go on a different direction from me. I never went near them.  
12647. What was the size of the board? I could not say.  
12648. Was it 10 x 10? I could not say.  
12649. Was it shifted about? Yes.  
12650. To where you would be working? Yes.  
12651. Therefore it would be pretty close to you? It would always be about 2 chains away from where I was working.  
12652. Could you not see the men who were working on it? I had plenty to do myself without watching other men.  
12653. But you would observe the men who were working at the board? No; I never knew one of them.

George Rogers sworn and examined :—

- G. Rogers.  
14 Aug., 1896.
12654. *Mr. Parkes.*] What are you? I am a labourer.  
12655. You have been working for Carter, Gummow, & Co.? Yes.  
12656. For any length of time? About four years off and on.  
12657. On what jobs have you worked for them? At Shea's Creek, at Marrickville, and at Johnstone's Creek.  
12658. You worked on both contracts at Johnstone's Creek? Yes.  
12659. What has been your particular work? Taking out rock.  
12660. Did you ever do any concrete work? A little; not much.  
12661. Did you do any mixing? I did a little for a few days.  
12662. Where? At Johnstone's Creek.  
12663. At what date? I do not remember. It would be about the time we first started.  
12664. On what date did you start? I could not tell you that.  
12665. Did you ever have to carry cement? No.  
12666. How was the cement brought to you? On drays.  
12667. Do you recollect the names of the men who had charge of the drays? I do not.  
12668. Will you give me the names of some of the men who were mixing concrete at the same time that you were? There was Driscoll and a man named Moore.  
12669. Do you remember anyone else? No; I do not.  
12670. Can you think of no other name? No; I cannot remember any. There were so many coming and going.  
12671. Were there not regular men working on the board? No.  
12672. Do you know how many men were working on the contract altogether? No; I do not.  
12673. Did you go into the cement shed? No, I did not.  
12674. You have never been into the shed? No; I do not think so.  
12675. Can you tell me when the Johnstone's Bay contract was completed as far as concrete work is concerned—I mean the storm-water channel? I cannot tell you.  
12676. Not even to a month? It was in March, I think.  
12677. Is all the concrete work completed now? Yes.  
12678. It was all completed in March, you think? As far as I know.  
12679. When was it completed to the flood-gate? It was completed when I left on the 17th March, as far as I could see. Whether more work was done there afterwards, I could not say.  
12680. Where are you working now? At North Shore.  
12681. On one of Carter, Gummow, & Co.'s jobs there? Yes.  
12682. You say that when you left the Johnstone's Bay contract all the concrete work was finished? I should not like to swear that it was. I left the job on 17th March, and some work may have been done afterwards.  
12683. But the whole of the channel was complete? I did not notice; I cannot say positively.  
12684. You did not observe it? No.  
12685. Was the concrete work kept going continuously in that channel? No; it was stopped for some time.  
12686. Did it follow up the excavation? Pretty well.  
12687. It would be fairly continuous then? Yes.  
12688. Did you ever see the mixing of the concrete done? I saw some, but not much.  
12689. Will you describe the method adopted? The box is filled with stones; then water is put on to the stone; then so much sand is put on, and spread over the stone, and the cement is put on the top of the sand. That is turned over three or four times.  
12690.

G. Rogers.

14 Aug., 1896.

12690. Is there a gauge-box used? Yes.
12691. What is the size of gauge box? About a yard I suppose; I never saw it measured.
12692. You could not tell the exact size? No.
12693. What would be the depth of the box? I do not know.
12694. Could you not tell from observation? It might be 12 or 18 inches deep, or it might be more.
12695. How many of these boxes would be used in one mixture? Only one.
12696. Then the cement would be put upon the top of the stone and sand? Yes.
12697. Did you do any mixing upon Contract 77? You mean for the arches—no.
12698. Did you do any of the work in connection with the putting in of the concrete? No.
12699. Most of your work was rock work—excavating? Yes; most of the time I was working at the stone crusher.
12700. Where did the stone come from which went through the crusher? Out of the quarry at Annandale.
12701. On what job was that stone used? On the storm-water channel.
12702. And on the other job as well? I do not know if it was used on the other job, but I know that it was used on the storm-water channel.
12703. Did Carter, Gummow, & Co. use the sand which came from that crusher? Yes.
12704. Did they crush any of the stone which came out of the tunnel itself? I do not know.
12705. You did not notice that? No.
12706. Did you notice where the sand which was used in connection with Contract 118 came from? Some of it came from the crusher.
12707. Where did the rest come from? I think it all came from the crusher, but I cannot be certain. I was on the concrete board, and the crusher was half a mile away.
12708. Did you see any men carting the sand? It was taken in trucks to the concrete board.
12709. Do you not know whether any bag cement was used upon the contract at Johnstone's Creek? I did not see any. No bag cement was used when I was on the board.
12710. How did the casks come to you? In drays, as far as I remember.
12711. Who drove the drays? I could not tell you.
12712. How is the cement put on to the stone and sand? The cask is rolled up on to the top of the heap, and it is then chopped up with an axe, the cement being levelled over the heap.
12713. Was that done in every case? In every case I saw.
12714. Did you ever see any casks upturned on the heap? I did not see them.
12715. Did you ever see a bag discharged on to the heap? No; I never saw any bag cement used when I was at the board. It was all in casks.
12716. Was an inspector of the Department always standing over you? Yes; Lougheed.
12717. Who was the contractor's foreman? Bandeden.
12718. Did he stand over the board? He was generally on the board.
12719. Can you remember the names of some of the others who were working there with you? Only the three I have mentioned, who were turning with me.
12720. Can you think of any others? No others who were turning with me. Others would be at work near the board. There would be Murphy, for instance; but he is in Queensland.
12721. Any others? Yes; John FitzGibbons was, I think, another.
12722. Do you know where he is now? I think he is working for Carter, Gummow, & Co., at Annandale.
12723. Do you know the names of any of the others? Yes; there were Byrnes and Kady.
12724. Any others? I do not remember any others; but there were a great many more, if I could only call them to mind.
12725. Do you recollect the names of any men who left the job before you left? No; I remember some men being put off when the job was finished.
12726. Can you tell me the names of some of them? No; I do not think so. A number of them who were put off that job are now working at North Shore.
12727. But you could not tell us the names of any of them? No; I do not think I could.
12728. Can you not remember the names of any of those who have altogether left Carter, Gummow, & Co.'s works? No.
12729. In mixing the concrete, to what distance in the channel did you work? I could not tell you; I was a week turning the concrete.
12730. Do you remember the distance in the channel you went when you were doing that work? No, I do not.
12731. How many lots of concrete would you mix during the day? I suppose fifty or sixty, perhaps more.
12732. Would that quantity be placed in position? Yes.
12733. Did you notice the depth of the invert in the storm-water canal? No.
12734. How was it put in—were there any boards to keep back the earth? Yes; there were boards where necessary to prevent it from falling in.
12735. How was the concrete put in? It was run off the concrete board to another board from which it was tipped and put in its place.
12736. It would then be rammed in? Yes.
12737. Were there any sticks to indicate the thickness? Yes.
12738. Do you recollect what length those sticks were? No.
12739. You did not fix any concrete at all upon Contract 77? No.
12740. Can you tell me where you worked in January last;—upon what portion of the contract were you then working? I was working at the crusher at that time.
12741. Where were you working in February? At the Johnstone's Creek sewer.
12742. Mining? No; moving concrete then.
12743. Where would you be working in March? I should be doing the same thing.
12744. Wheeling concrete for the Johnston-street sewer? Yes.
12745. Would you be wheeling it during the whole of those two months? I think so, but I could not be sure.
12746. How far do you have to wheel it? Not very far—about 20 or 30 yards.
12747. In those two months you would have a good opportunity of seeing concrete made? No; I just emptied my barrow and went away for another.
- 12748.



- G. Rogers. 12748. But you would look on sometimes? I had no time for that.  
 12749. But your eyes would be about you? I had no time to notice others.  
 14 Aug., 1896. 12750. You can surely tell us the names of all the men who were working there? Where so many men are working on a job one is apt to forget names.  
 12751. Do you not know all the men on the job? I might know them if I met them, but I might not know their names.  
 12752. *Mr. Carter.*] You have said that Driscoll was working on the board—do you know whether he was working on the board or at the ribs;—do you remember that? He was working in the ribs.  
 12753. Not on the board? No; he was working on the ribs.  
 12754. You have not much time to straighten your back when you are on the concrete board? No.  
 12755. *Mr. Parkes.*] I presume you talk to the men who are on the work? No; we are not allowed to talk.  
 12756. *Mr. Carter.*] How long is it since you were mixing the concrete for the week to which you referred? It was about the time we started.  
 12757. And that would be twelve months ago? Yes.

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Thomas Kady sworn and examined:—

- T. Kady. 12758. *Mr. Parkes.*] You worked on the concrete at Johnstone's Creek sometimes? Sometimes.  
 12759. At what time would that be? Whenever there was any need for it.  
 14 Aug., 1896. 12760. When you used bag cement on that job did you carry it to the works? A few bags were broken, and the contents of those bags were put into a couple of casks or so and carried on to the work.  
 12761. What time was that? I could not say. I did not take particular notice.  
 12762. Was it about March? Not that I know of.  
 12763. In what month was it? I could not tell you.  
 12764. Do you not recollect at about what date it was? No; I do not.  
 12765. Can you not recollect the month approximately? No; I never remember things of that sort.  
 12766. How did you fix up the casks—did you put the tops on again? Yes.  
 12767. Did you nail them down? No; they were just laid on.  
 12768. You did not nail them down then? No; the top was left open. There were only a few casks filled altogether.  
 12769. When you got the casks on to the job, what did you do with them then? I did not go to the job with the casks. I stopped in the shed.  
 12770. Do you recollect the date approximately on which that was done? No.  
 12771. You are sure of that? Certain of it.  
 12772. Do you not remember in about what month it was? No.  
 12773. When you sent bags down to the job were they broken on the top of the concrete? Yes, on the concrete board.  
 12774. You are sure the bags were broken there? Yes.  
 12775. How many bags go to a cask? Three bags.  
 12776. When was the floodgate on that job completed? I saw them working there up till Friday last, but the men did not belong to Carter, Gummow, & Co.  
 12777. When was the storm-water contract at Johnstone's Bay finished? I could not tell you.  
 12778. Cannot you recollect at all? No.  
 12779. You cannot recollect in about what month? I cannot.  
 12780. You cannot think of it at all? No.  
 12781. How much bag cement is there in store there now? I could not tell you. There are a good few hundred bags there.  
 12782. Five hundred? Yes, 1,500.  
 12783. How many casks? I could not tell you.  
 12784. A hundred? Yes, more.  
 12785. What is the size of the shed? I have never measured it.  
 12786. As to the mixing of concrete, what do they call a batch? It depends upon the stone. In some cases there are 16 feet, and in other cases 20 feet. Added to that there would be 8 feet of sand, and 4 feet of cement.  
 12787. What would be the 16 feet stone? Bluestone.  
 12788. How much of sand would that take? 8 feet.  
 12789. And how much cement? 4 feet.  
 12790. Then in the sandstone concrete, how much goes to the batch? 20 feet of stone, 8 feet of sand, and 4 feet of cement.  
 12791. To what size is bluestone broken on the Johnstone's Creek work? I have never gauged it.  
 12792. But you could tell by your eye pretty well, could you not? No, I could not tell you the size.  
 12793. What does the specification say? I do not know anything about that.  
 12794. What would be the largest stone roughly? I could not tell you.  
 12795. Would it be  $2\frac{1}{2}$  or 3 inches in the case of the bluestone? Nothing like that. It is small metal.  
 12796. In the case of the sandstone, what would be the largest stone? I could not tell you, I think it is supposed to be  $2\frac{1}{2}$ -inch.  
 12797. Roughly speaking, what would be the size of the largest stone? I could not tell you.  
 12798. Have you worked from the beginning to the end of Contract 118 at Johnstone's Creek? Yes.  
 12799. How long have you worked for Carter, Gummow, & Co.? I have been working for some of the company a good few years. I worked for some of the company before Carter and Gummow came into it.  
 12800. You have a superior position as compared with the ordinary men? No.  
 12801. What wages are you getting? Eight shillings.  
 12802. Can you give me the names of the men who have been working on the concrete board, as a general thing? Some of the men who worked there I have never known. I was not always on the concrete board; I was off and on.  
 12803. Where did you work particularly? I took out some of the excavation, and I was also a good part of the time at the crusher.

T. Kady.

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12804. What did you do at the crusher? I filled the trucks from the crusher.
12805. Do you know the names of the men who were feeding the crusher? No; they were strangers to me.
12806. Where did the stone which went into the crusher come from? I could not say.
12807. Did any of it come out of the excavation? Not that I know of.
12808. Can you tell me the names of any of the men who have lately left this work? I cannot. You might be there months before you took any notice of a man's name, unless you happened to hear it called out at the office on pay-day.
12809. Did you do any work upon the aqueduct in Contract 77? I do not know what you mean by aqueduct.
12810. Did you never hear the word in your life before? No; if you mean the arches, I was working there.
12811. What was the mixing of the concrete in that case—what went to the batch? Twelve feet of stone, 6 feet of sand, and 4 feet of cement. One cask of cement went to the batch.
12812. Did you see the cask broken on the concrete? Yes.
12813. Will you swear that? Yes.
12814. Where was that concrete carried to? It was taken up on to the carriers.
12815. Where was it put? Into the sewer.
12816. Into what part of the sewer? Into the invert.
12817. Do you mean into the sides? Yes.
12818. Was it rammed? Yes.
12819. Was it well rammed? Yes.
12820. Was any bag cement put into that work? No.
12821. Is the whole of the material wheeled in a barrow? Yes.
12822. It is not pulled up in buckets and put into the work with spoons? No; the barrow was pulled up by a horse. In some cases it was wheeled straight on to the work.
12823. Where did they get the sand to mix with the material which went into the arches? I think it was obtained from North Sydney.
12824. Who brought it on to the works? That I could not tell you.
12825. Where did they get the sand which went into what you call the invert? That was North Sydney sand, I think; but I could not say where we got the sand from.
12826. Did you ever take any sand from the crusher for this work? Not for the arches.
12827. Where was that sand used? In the storm-water channel.
12828. Was any of it used in the piers? Not that I know of; I was not working on the piers.
12829. Who was the foreman at Johnstone's Creek? A man named Bandeden.
12830. Was the Government inspector's name Loughheed? It might be; I never inquired his name.
12831. Did you do much concrete mixing for the aqueduct work? No.
12832. How much did you do? I could not tell you.
12833. How long were you at it? I was there a few days when they were doing the work.
12834. Did you shift from one part of the work to another while the work was being done? Not while the Johnstone's Creek work was going on. When that was finished, I went for some days on to other jobs, and so on.
12835. Have you seen the concrete mixed on the Johnstone's Creek job? I have seen some of it mixed.
12836. Is it not the fact that two batches of stone were used to one cask of cement? Not that I am aware of.
12837. But think distinctly about it? It was not done that I am aware of.
12838. You are sure of that? Certain of it.
12839. You never saw such a thing done? No.
12840. Did you ever mix concrete yourself? Yes; I have mixed a lot of concrete.
12841. *Mr. Carter.*] As to the broken bags of cement, how many, roughly, were there—were there forty or fifty? I do not think there were that number. There might have been about twenty. I sewed up some of the broken bags.
12842. But some of them were too bad to be sewn? Yes.
12843. So that there was no other practicable means of taking the cement down to the board except by putting it into casks? No.
12844. How many bags did you sew up? A good few.
12845. *Mr. Parkes.*] Do you know a man named Moore who worked on this job? I have heard of him.
12846. What did he do? The last time I saw him he was working at the muck.
12847. At what time was that? When we were taking out the excavation.
12848. In about what month? I could not tell you.
12849. You cannot recollect dates? No.
12850. *His Honor.*] What time of year was it—was it summer or winter? I think it was in the summer.
12851. *Mr. Parkes.*] Do you remember distinctly a man named Moore—are you sure the man you are thinking of was named Moore? God only knows; I do not.
12852. Is he still working on the job? No.
12853. Has he left it? Yes.
12854. Long ago? Over six months, anyhow.
12855. Where was this man working six months ago—was he working on the muck then? Yes; the last time I saw him.
12856. Was the muck being taken out about six months ago? Yes. I left Johnstone's Creek at that time and went to work on the piers and arches.
12857. When did Moore leave? I do not know.
12858. You are sure he is not still working on the job? I do not think so.
12859. You think he has left Carter, Gummow, & Co.'s employ? I think so.
12860. Do you know where he has gone to? He may have gone to Western Australia for aught I know?

John Carter recalled and further examined :—

- J. Carter.  
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12861. *Mr. Parkes.*] The last pay-sheet entered in your book is dated 21st May, 1896? Yes.
12862. Are all the men included in that sheet all the men working on the job? All those men were working on the job when that pay-sheet was made out.
12863. Would there be any others? Not necessarily. One might be omitted, but there would not be more than one or so omitted.
12864. Have you shifted any from this job to North Shore? Yes; we shift them about. They get work if there is work to be given. The North Shore work is different from other work. It is excavation. There are plenty of men who are not fit for excavation.
12865. Taking the pay-sheet under date of 21st May, 1896, all the men included in that sheet were working on that date? Yes.
12866. And the inference would be that men whose names did not appear in that pay-sheet would have left the works? Yes. It does not mean that they have necessarily left our employment.
12867. But some of them would have done so? Yes, a few.
12868. Where would those who have not left your employment have gone? To North Shore.
12869. Can you give us the names of any of those who have been transferred from North Shore? Yes; Bandeen is one.
12870. When did he go to North Shore? At the commencement of the contract—say, four or five months ago.
12871. Are there any others? Yes; Driscoll, Rogers, Kerwick, Davidson, M'Lellan, M'Quirk. Galvin has gone to Coolgardie.
12872. When did he leave? I could not tell you.
12873. The pay-book would show? Yes, I dare say it would. If his name did not appear in one pay-sheet he would probably have left between that date, and the date of the preceding pay-sheet.
12874. You say he is gone to Coolgardie? I could not say definitely where he is gone. Some of them go up on to the rivers cane-cutting.
12875. Galvin was working up to what date? Up to 7th May, 1896, according to the pay-sheets.
12876. Has he been working for you since? He may have been working at North Shore for aught I know.
12877. How long was Moore with you before he left? He is an old sewerage hand.
12878. How long had Galvin been working with you before he left? He was another old employé. Some of them were employed by members of the Company ten years ago; before I was in the firm at all.
12879. Kady has been a long time with you? Yes; ten or twelve years, I expect.
12880. Could you tell me the names of any other men who have lately been sent off your works? No; I do not send them off at all. I see their names in the sheet on pay-day. That is all I know of them.
12881. But you would hear of their being removed? That is no part of the firm's business. The ganger removes the men. We do not interfere with the men. They go to the office and get their pay, and that is all we know about it.
12882. Can you tell me when you completed the Johnstone's Bay sewer? I am not sure that it is completed yet.
12883. There is some concrete work to be done there? There may be. It has not been finally measured up. Practically, however, the job was finished some months ago.
12884. Were you not putting in concrete there in March? We might have been.
12885. You were not finished down to the tramline in March? Yes.
12886. Was the concrete completed? We were working the other way.
12887. From the bay upwards? Yes.
12888. What were you doing there last March? I have not the faintest idea. We were concreting and rendering I suppose.

Joseph Davis recalled and further examined :—

- J. Davis.  
14 Aug., 1896.
12889. *Mr. Parkes.*] Mr. Hickson, in his minute in reference to Contract 69, says there was a saving of £750 made upon the alteration from a double sewer to a single sewer. That is the 10 chains running from Premier-street to the Illawarra Road? Yes. Mr. Hickson, in his minute, says, "This addition is caused by an alteration in the original design, which has the effect of reducing the cost of the work in this contract by about £750. There is a further reduction on the whole work of £10,000. Recommended for approval."
12890. If you turn to the comparative estimates which appear upon pages 130 and 131 of the Parliamentary return you will see that you have a measurement of 1,329 cubic yards of excavation; that was done; the next portion of the sewer, viz., 6 ft. 10 in. x 5 ft. 10 in. and 5 ft. 2 in. x 4 ft. 2 in., has an item of "excavation, 1,541 yards," which is again carried forward? The last four estimates were estimates that were prepared at the time the alteration was under consideration. They were estimates which were not adopted, but they were necessary in order to lead up to the one which was adopted. You will observe that the first two estimates referred to, the one at the bottom of page 130 and the one at the top of page 131, are both for an 8 ft. x 7 ft. sewer. The sewer that was adopted was 7 ft. 8 in. x 6 ft. 8 in. It was found, eventually, on more careful calculations being made, that a smaller sewer would be sufficient to carry away the whole sewage; consequently the smaller size was adopted instead of the 8 ft. x 7 ft., so that these four estimates, while they were necessary in order to arrive at a conclusion, scarcely bear upon Mr. Hickson's minute. Estimates 3 and 4 relate to sewers 6 ft. 10 in. x 5 ft. 10 in. and 5 ft. 2 in. x 4 ft. 2 in. The first one is for two-ring brickwork and the second one is for one-ring brickwork, and that explains the difference between the total amounts of £4,173 12s. 6d. and £4,068 14s. 5d.
12891. That is clear enough; but that is not the explanation I wanted? It was necessary that I should say that in order to lead up to the estimates which were adopted. The estimates which were adopted are given on page 130. Even there there is a little confusion. The printer seems to have transposed the estimates. The estimate of the 7 ft. 8 in. x 6 ft. 8 in. sewer, properly speaking, relates as to the details to the first item in the comparative estimate for the construction of sewers, western branch, western suburbs sewerage. Then follow the estimates for the 6 ft. 10 in. x 5 ft. 10 in. and 5 ft. 2 in. x 4 ft. 2 in. sewers. That is their proper order. They have got a little muddled up, and I confess that the other day I was not able to follow them.
- 12892.

12892. Who would make these calculations? They would be made in the drawing office, under Mr. Bagge. J. Davis.
12893. Who made them, as a matter of fact? Mr. Cutler, assisted by M'Kay. They are in Mr. M'Kay's handwriting partly, and partly in that of Mr. Cutler. The sewers in the original contract were 6 ft. 10 in. x 5 ft. 10 in., and 5 ft. 2 in. x 4 ft. 2 in., and the question was whether the substituted sewer should be 8 ft. x 7 ft. or 7 ft. 8 in. x 6 ft. 8 in. 14 Aug., 1896
12894. Which was adopted? The 7 ft. 8 in. x 6 ft. 8 in. The estimates at the bottom of page 130, and at the top of page 131, do not apply, as a matter of fact.
12895. But if there were a lesser sewer there would be less saving? Mr. Hickson's minute relates not to 8 ft. by 7 ft. sewer, but to the one adopted.
12896. But the saving upon the large one, the 8 ft. x 7 ft., would not be £750? You will find that Mr. Hickson is well within the mark.
12897. According to these estimates he would not be? According to these estimates he would be, as I say, well within the mark. Take the saving, as stated by me, of £10,608 10s., and assume that the length of the sewer between Premier-street and the Illawarra Road is 10 chains, and that £10,608 is saved in the 70 chains, the saving between Premier-street and the Illawarra Road would be one-seventh of that; that is to say, it would be £1,500 or thereabouts.
12898. That is if the work had never been excavated? That is if the work had not been touched.
12899. If it had not been excavated? That is the case, so that Mr. Hickson is well within the mark in saying that £750 would be saved. If you take 8 chains, then the saving would be a matter of £1,100.
12900. But you have a set of estimates and quantities? It is on those estimates that I make the statement that the saving would be £1,100.
12901. But that is not borne out? I think Mr. Hickson, as I said before, was well within the mark. I do not quite remember how he arrived at the £750, but he was certainly well within the mark.
12902. It was only a guess after all? I will not say that it was a guess. It was his idea of the saving.
12903. But actually the amount is not saved? Decidedly it is.
12904. First of all you have to take off it two amounts of £100 and £37? Mr. Hickson probably made a very large reduction from the £1,100 to bring it down to £750.
12905. But the details of the actual work and the work to be done in these sewers are actually given—the details separate from the general saving;—what I want to know is, if the details are taken out, whether it is not clearly shown that the item of 1,541 yards for excavation should not apply to both estimates? You are referring now to the first two estimates upon the top of page 131. They have no bearing upon the case.
12906. It seems to me that they have a big bearing upon it? They are headed "Construction of Sewers—Western and Canterbury Branches from chamber, Premier-street, to shaft, Illawarra Road." They have an indirect bearing upon the case inasmuch as they led up to what was adopted. But these estimates were not adopted, and it was not on these estimates that the recommendation was made.
12907. But you say that you have lessened the sewer, and that would reduce the estimate again? The estimate for the 7 ft. 8 in. x 6 ft. 8 in. sewer appears upon page 130.
12908. That is for the whole sewer? That is so.
12909. After that you worked out in detail what would be the proportion to be saved in this actual section? The details to which you refer were worked out before that, and were set aside after it was concluded that the proper course to follow was to adopt the 7 ft. 8 in. x 6 ft. 8 in. sewer.
12910. Every yard of that excavation is put down at 27s. 6d.;—will you roughly work out what value that would be in the excavation alone? The cost of the excavation of 8 chains of tunnel for the 6 ft. 10 in. x 5 ft. 10 in., and the 5 ft. 2 in. x 4 ft. 2 in. sewers, is £271 1s. per chain. The excavation for the 7 ft. 8 in. x 6 ft. 8 in. sewer is £166 7s. 6d. per chain; so that if you multiply each one of those amounts by 8 you will have the difference. They are respectively £2,168 and £1,331—a difference of £837 8s. in favour of the 7 ft. 8 in. x 6 ft. 8 in. sewer.
12911. That is in the excavation for 8 chains; but the excavation had been done—that is the point;—all the excavation was done when you made this arrangement? The excavation was done for a 6 ft. 10 in. x 5 ft. 10 in., and a 5 ft. 2 in. x 4 ft. 2 in. sewer.
12912. So that really, as regards the estimate appearing upon page 131, they would be correct if the 1,541 yards were applied to both? The estimates to which you refer on page 131 have really nothing, except indirectly, to do with the matter.
12913. In calling for tenders you say with every schedule "the quantities are not guaranteed as correct, but are merely for the guidance of tenderers, who must satisfy themselves as to their accuracy, which is not in any way guaranteed by the Government; they are subject to deduction, omission, or alteration;"—you notice that? Yes.
12914. Therefore, when you call for tenders, you take to yourself the power to alter the contracts in any way you wish? Yes; a general power is taken in the general conditions, and the note to which you refer is in conformity with that.
12915. So that a tenderer, when he sends in his tender, knows that it is in the power of the office to regulate the tender while it is in course of operation in the form of a contract equitably as between the two parties concerned? I would not say "regulate." I would not use that word. I would say that we take power under the contract to omit or increase where the exigencies of the work and the circumstances that may arise necessitate that course.
12916. But the position of an engineer is that of an arbitrator between the two parties, is it not—the one who is employing the contractor and the contractor himself? The position of an engineer, as I understand it, is this—that he represents his principal, but he represents his principal in doing what is just and equitable both towards his principal and the contractor.
12917. And in framing specifications and schedules, is it not the practice of engineers to so frame them as to have an equitable arrangement between the two parties? Yes; I should say so.
12918. You are speaking now from your practice as an engineer? I certainly think that an engineer should not use any power that might be given to him under a contract to oppress. I should say that he would be wrong if he did that.
12919. The object of this specification is to enable him to do what is fair between the two parties? I think so.
12920. For instance, you have in your specification a clause which allows of your taking off or putting on work

- J. Davis. work in connection with any job? We have the general power, but it is questionable how far it would be equitable to put that power into operation for small things. No doubt that is the case. Suppose that after a shaft has been put down circumstances arise requiring the design of the shaft to be altered, in that case the engineer, I should say, would have the right to alter the shaft to any extent so long as he provided for the same kind of work as was originally shown, and he would have a right to expect that work to be done at schedule rates. If he introduced work of a more expensive kind than that originally shown it would be questionable how far he should ask the contractor to carry it out without allowing him a compensating amount.
- 14 Aug., 1896. 12921. You yourself have said in your evidence that you have put into your schedules every item you could possibly think of? I do not think I said that. I said that we had to provide for every conceivable emergency that might arise in a contract in order to get a fair price for the work which had to be carried out.
12922. In the case of 69, however, you put in items for the excavation of material not shown by your bores? No; I do not think so. [*Vide Appendix, No. 52.*]
12923. Did your bores show every one of these different descriptions of excavation? Yes, generally speaking.
12924. You did not show them on the plan? As far as it was practicable to show them on the plan we have shown them, and what we had on the plan we have shown in the schedule. We know pretty well from experience what the nature of the ground is which is likely to be met with in these tunnels, and we provide in the schedule for that ground.
12925. What is the object of your putting in special bluestone to be placed in any situation where required, or, where ordered, 1 to 1 cement? If you refer to item No. 88 you will find that it is placed with a number of items which may or may not occur. The probable quantity is given in that case as 10 cubic yards. That is given merely to get a price from the contractors. It is the same as the items for labour and Oregon timber and other things of that kind. In order to get a price from the contractor we put in a small quantity.
12926. Lately, even under this new form of schedule, in connection with which you say you make such a saving, there appears an item of £8 a cwt. for iron instead of per ton? I do not think I have said that we should make such a great saving. I say, and I think I can support what I say, that the old system was unsatisfactory, and we thought that it would not do to continue such a system, when we received tenders such as we did in the case of Contract 69. At the same time—taking the work over a number of years—I can show that while on some occasions the contractors made on other occasions they lost. I will take the contracts which we let to Carter, Gummow, & Co., extending over six years. I find that the work which they had finished for the Department, according to the final vouchers, comes to £304,466, while the amount of the tenders works out at schedule rates at £292,975, there being a difference of £1,149. The final voucher exceeded in some cases the tender through the speculative tendering, but in other cases there was a saving to the Department, so that the one counterbalanced the other. In the case of Contract 69, the amount in favour of the contractor was great; still, taking the whole of the dealings of these contractors with the Government, extending over a period of six years, there was only a difference in favour of their own pockets of £1,149. I would like to go further in that matter. I have a list here of the whole of the contracts let since the initiation of the Sewerage Department. All these contracts are finished, and, with very few exceptions, they were upon the old system. They will show that the amount of the tender, as worked out at schedule rates, upon the whole of the works completed since the initiation of the Sewerage Branch, amount to £1,440,225, while the amount of the final vouchers is £1,433,186, a saving, if you choose to call it a saving, in favour of the Department of £7,038. So by taking the system as a whole the Department did not lose. I certainly say, as I have said on former occasions, that I think the system which has been adopted is the best for the Department. It is the most satisfactory.
12927. The totals you have given represent comparisons with the office estimates? I am leaving the office estimates out of the question. I am taking the tenders as received from the contractors, and comparing them with the amount of the final vouchers, both in regard to Carter, Gummow, & Co., and also in regard to all the contractors who have carried out work for the Sewerage Branch.
12928. But taking the tenders, if you alter, remodel, and adjust the items in the schedule, upon which those tenders are founded, you cannot tell what the profits are? We have not altered the schedules or adjusted anything. We have carried out the work since I have been connected with the Sewerage Branch—a period of thirteen years—in a legitimate way. I believe we have, as far as I can judge, done the work satisfactorily. The figures I have given you represent the results.
12929. [*His Honor.*] What you mean is that you have compared the tenders on the probable quantities—that is, the totals shown in those tenders—with the actual cost? Yes.
12930. And comparing the two in that way, you find the results which you have given? Yes; the result shows that, while in some cases, as in Contract 69, the contractors certainly did get an advantage over the Department, in other cases, if you can call it an advantage, the Department got it. That was due entirely to the speculative tendering. It is impossible before the work is carried out to say whether a particular item would be required, or, in some cases, what quantity of any particular item would be required; but, putting one thing against the other, the returns referred to show clearly that the Department did not lose, but that, on the contrary, it gained.
12931. Of course Contract 79 is an earlier contract than Contract 69, although numbers go the other way? Yes.
12932. I notice that the schedule is very much more elaborate in the case of Contract 69 than in the case of 79—that is, there are more details in the schedule? You are referring, I suppose, to the excavation. The explanation of that is simply this:—The nature of the ground is entirely different at North Shore. There could be no question that, in that case, the whole of the tunnelling would be in rock, whereas in the case of the Marrickville contract the borings showed that portions would be in rock, and the schedule had to be fixed up for that; portion would be in the open cutting, and the schedule had to be fixed up for that; and then a portion would be in doubtful ground—shale, soft or hard clay, or whatever it might be. It is impossible to say what it would be until the tunnels were driven. That is the reason why the schedule in the case of Contract 69 is much more extensive than the schedule in Contract 79.
12933. While we are upon that point I may mention that there is one detail which has puzzled me. I refer to the excavation in “solid rock” in shafts, shaft chambers, and sumps, as specified in clause 3. You will

will see that that appears between items 11 and 12, and that item No. 12 is for excavation in road surfaces, soil, clay, pipeclay, shale, and soft rock;—is the "solid rock" which appears there a mistake in printing, or has it a special meaning there? The explanation is simply this—that in the case of the Marrickville contract, although we did our best to say precisely where the solid rock would commence and where it would finish, I could give instances where in similar cases the ground is so uncertain that contractors have found in a length which was shown on the drawing, and supposed to be, solid, rock, soft ground, and in that instance, although the ground was soft, and would only cost a few shillings to take out, they got paid for solid rock.

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12934. Where was that? In Harrington-street, in Jones and Atherton's contract. They were very rightly paid, because there was no schedule to cover such an altered condition. That is the reason why the heading of that section reads in "solid rock." You will observe that solid rock is in inverted commas. That refers to a length of sewer shown in the drawing to be solid rock. Something might be in that length which was not solid rock, and to meet that emergency item No. 12 was put in. That has reference more especially to shafts. Of course, in the case of shafts, there would be soft ground at the top.

12934½. The solid rock would seldom come to the surface? No; items 12, 13, 14, and 15 would be for the length designated on the contract drawing as in "solid rock," but in that length necessarily there would be the surface at the top of the shaft, and that would not be solid rock.

12935. You explained that the reason why you put in subducts as a heading in this schedule was that subducts might be required anywhere? Yes.

12936. But the experience of the Department has shown that subducts are hardly ever required? Yes; they are quite the exception.

12937. Yet you put in a substantial amount for subducts, not a nominal amount;—you put in a substantial length of a subduct, and that might have an effect upon the tendering? That is the case, and I can only explain it in this way. Mr. Bagge prepared these schedules. He had certain little fads of his own, and he used to put in subducts.

12938. But was he a great believer in subducts, in point of fact, do you know? No; but he was an exceptionally careful man—a most cautious man—and his idea was that if they were left out of the schedule and they were required he would be to blame. In order to cover himself he put them in.

12939. It did not strike him that it would increase the chance of rigging the schedules, so as to bring, perhaps, the larger tender out to be apparently the lower one—that is, the putting in of special items for these particular things which were not likely to be done? That is so. Mr. Bagge thought that, if a quantity were not put in the schedule and subducts were required, he would be to blame for having the contract exceeded. I believe their being put in is due entirely to Mr. Bagge's cautiousness.

12940. As far as you can understand it, it was his doing? Entirely. He prepared all the schedules. I used to confer with him and give him the best of my advice, founded upon the experience which I had gathered from day to day.

12941. These schedules could be revised and altered only by Mr. Hickson? That is so.

12942. And Mr. Hickson, as a general rule, could not go into such details as that? He could not. Mr. Bagge was a very conservative old gentleman. He did not like interference. I know that, as a matter of fact, Mr. Hickson had the greatest trouble with him to get him to alter the system. He had been going upon the old lines for so many years that he could not see the force of the alteration. Mr. Hickson had a great deal of trouble in getting it done at all.

12943. *Mr. Parkes.*] Will you describe how the alteration took place;—is there any record in the Department of any correspondence preceding the change? I believe not. The only thing I ever saw in writing was at the time Mr. Hickson decided to adopt the new system. It would be in January, 1894, I think. He then sent up to Mr. Bagge, on a sheet of note-paper, instructions to that effect. Beyond that I never saw anything in writing, except that at the beginning of last year, about the time of the reorganisation of the Department, Mr. Hickson wished the system to be generally adopted in the Department, and asked the three principal assistant engineers to take the matter into consideration and to see how the change could be brought about.

12944. Do you know whether in the latter part of 1893, or in the early part of 1894, there was a notice of motion given in the Legislative Assembly for a change in the contracting system and the determination of public contracts under the Public Works Department? I am not aware of that, but I know that you have been most persevering for a very long time.

12945. Did you ever hear of such a notice of motion? I may have done so, but did not pay much attention to it. It certainly had nothing to do with the change, if that is what you want to know. I talked with Mr. Hickson very many times about the whole system. I saw that the rigging of the schedules was getting worse and worse, and that something would have to be done. After conferring with him several times upon the subject, we came to the conclusion which I have indicated.

12946. Did you ever hear in the office that the Minister of the day had been requested to make a change in the method of issuing specifications and schedules for public contractors? No; I do not know that I did, except in a general way. No doubt anything which took place up at the Legislative Assembly would get to be known down here, and it would probably become the subject of general conversation, but I remember nothing special about it.

12947. Have you no letter in the Department bearing upon the subject? Not to my knowledge. I have already said there were no papers in existence. I should have known of them if there had been any. Mr. Hickson has given nothing but verbal instructions with the exception of the writing of the sheet of note-paper to which I referred.

12948. What would become of that? Mr. Bagge would have it. He may have it in his possession now, but I cannot say positively, of course.

12949. *His Honor.*] Would it remain in his personal possession or would it be filed in the office? Search has been made for it, and no record can be found. It was never registered. Mr. Bagge must have kept the paper himself. Whether he destroyed it or has it still I do not know. The system was initiated at the beginning of 1894. The first tender under it was received in March. The tenders for Contract 69 were received in the previous December. The change was made more particularly as the result of the tender received from Carter, Gummow, & Co. in connection with Contract 69.

12950. *Mr. Parkes.*] Did not numerous contractors complain to you that the way in which the specification was drawn and schedules issued allowed you to destroy certain contractors and benefit others? My experience



J. Davis. experience of contractors goes to show this, that the generality of them are never particularly satisfied with either specifications or schedules. I have never heard from any contractors of undue preference being given to particular contractors.

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12951. Have no contractors ever asked you to adopt another system, which would admit of greater equity in tendering as between themselves and other contractors? I do not remember any such case.

12952. Have contractors ever asked that they might have the plans and specifications put before them without any schedules at all, so that they might take the risk in a lump sum? No, I think not; and I think, also, that, in regard to sewerage works, that system would be most undesirable for the Department, and most undesirable for contractors. It would be most undesirable for the Department, because it would be quite impossible to get any idea of what the work would cost.

12953. Have contractors never told you that they would be content if you put down bores, and showed them the cores of every shaft? No.

12954. They never have? No.

12955. You have never been approached in that way? No.

12956. Not by contractors desiring to have a change made? No.

12957. Do you know whether Mr. Hickson has had such representations made to him? That may be so. I do not know what may have taken place in his case. I think the change you suggest would be most undesirable for the contractors, on account of the risk they would have to take, and on account of the amount they would have to put on to cover the risk.

12958. But you have said yourself that contractors necessarily had to take a risk? This schedule may, to those who are not accustomed to it, look elaborate; but with this kind of work there is much uncertainty as to the nature of the ground, and as to the thickness of the lining which has to be put in, and a hundred other things. It is for the well-being of the Department to reduce the risk of contractors to a minimum.

12959. Suppose the contractors had to take the risk, that would not be likely to increase the expense with competitive tendering? The contractor would have to put in a tender on the off-chance of his having to carry out the work, and he might not have to carry it out. The object in all these schedules is simply to pay for what you get done. If you get a yard of rock excavated, you pay a fair price for it; if you get a yard of concrete done, you pay for it; and so on. We do not want the contractors to take any risk. We know that if they do they will have to be paid for it.

12960. Take an ordinary contract under your present system; you may have certain items stated by the Department 100 per cent. in excess of their value, whereas the value of other items may be understated? I would not say that. What I say is, that there is room in a number of these matters for difference of opinion. I may say that concrete, taking all circumstances into consideration, would be worth 40s. a yard, and put it down in the schedule at that price. Mr. Alexander Dean, having a plant at hand and being prepared to give supervision for nothing, may think that he can do the work at 35s. a yard.

12961. But take the differences exhibited in the prices in your own schedules; take the Schedules of 77, and the Schedules of 112 and 118; take also the difference between the Schedules of 79 and 79A; you have some items at an excessive price and some items at a low price? I do not say that that is the case. The tenders we received for the contracts you have specified were all below the office prices, and they certainly varied. The successful tenderers varied from those prices, but they were pretty near.

12962. But after all, to give the contractors data, would it not be better to put down your prices and prepare your specification and permit the contractors with their knowledge, which, as you say, is greater on the part of some contractors than on the part of others, to compete? That would no doubt be to the advantage of the men who knew the locality particularly well. They would be able to turn their experience and knowledge to account; but it would certainly be most undesirable for the Department, from every point of view. There would be endless disputes in the carrying out of work. During the progress of work, all kinds of changes have to be made in the design to meet altered circumstances; and, when these changes were made, the contractor, even if he had no claim, would make one. They do so upon every conceivable pretext.

12963. Why did you depart from your rule and let Carter, Gummow, & Co. two contracts at lump sum? If you will take one contract first, and ask me a question about it, I will endeavour to explain it.

12964. Take Contract 79A? That was regarded as an extension of Contract 79. Carter, Gummow, & Co. asked to be allowed to get it as an extension, and Mr. Lyne decided, as he has already stated, to give them the extension on the office estimate at lump sum.

12965. The other contract is No. 77? It has already been fully explained, with reference to the two tenders of £15,757 and £15,500, why the latter was accepted. The Department considered that it was wise to try the new Monier system.

12966. Have you gone into any details as to the cost? There was something done, but nothing very much. Subsequently, however, the matter has been very fully gone into.

12967. What was done to find out the real cost of Contract 77, according to the substituted plan? I think Mr. Hickson's minute states precisely what was done. I do not think anything more was done at that time. As far as I am aware, nothing more was done.

12968. *Mr. Norrie.*] When you draw specifications and schedules, have you any other interest in view at the time than that of the public? Certainly not. We try to conduct the business of the Department on the best business lines. We also try to conduct it economically.

12969. *Mr. Parkes.*] You do not draw up the schedules? I do now; but I did not at that time. I gave Mr. Bagge credit, however, for being a most conscientious and careful old gentleman.

12970. *Mr. Norrie.*] You do not think that Mr. Bagge, when he drew the specifications and schedules, was actuated by any motive other than the consideration of the public interest? I am positive he was not.

12971. *Mr. Parkes.*] Did he draw them? Yes, with his own hand, and he would not allow anyone else to touch them. If you suppose anything to be wrong you must begin with Mr. Bagge and go to the Chief Draughtsman, and you must then include all the draughtsmen in the office. They must all be in league together to sell the country. It is impossible for anything of that kind to be done without the whole of them knowing it. One officer would prepare the quantities, another would check them, then they would come on to Mr. Bagge in a schedule and be sent to the printer, and so on. It would be impossible for anything of the kind which you suppose to have taken place.

12972. *Mr. Norrie.*] As to the power vested in the engineer under the general conditions, have you always, according to your judgment, acted reasonably in that matter? I think so. Not always in the way



way which has satisfied the contractors; still, I think we have always done that which was reasonable and equitable.

J. Davis.

12973. Mr. Parkes asked you just now whether you remember having noticed at any time a motion in the Legislative Assembly for a change in the system of public contracting in connection with the Public Works Department;—I have a paper of the Legislative Assembly under date of April, 1892, and I will ask you to read notice of motion 78 which appears upon that paper? It is as follows:—

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MR. PARKES to move,—

- (1.) That, in the opinion of this House, it is expedient, for simplifying the machinery of government, and for economy, that all the permanent professional branches of the service, such as engineering, surveying, architecture, law, and photography, shall be abolished, and the work performed by independent practising competitors, acting under instructions direct from the Minister under whose control the particular matter may be, and for whose advice a consulting officer alone shall be retained.
- (2.) That the above Resolution be communicated by Address to His Excellency the Governor.

I do not know what Mr. Parkes wished to infer when asking me a question just now about that notice of motion. I presume he wished to assume that the effect of it was to stir up the Department. If that were so, and I do not know that it was, I should think he ought to be gratified.

12974. *Mr. Parkes.*] How do you know that the notice of motion which you have read was not based upon information similar to that which I have received recently? I do not know anything about it. I have never before seen it, to the best of my recollection.

12975. Might not the particular notice of motion I referred to have been founded upon information of a similar nature to that upon which this inquiry is founded? It might be. I know nothing about that.

12976. The object being to have an inquiry similar to this? Yes.

12977. *Mr. Norrie.*] As to the adoption of the percentage system of tendering, do you know whether Mr. Hickson from time to time consulted me as to the change? He did. I know that in talking to him about it he thought the legal difficulties were so great that they were simply insurmountable, and I know that he consulted you as to how they could be overcome.

12978. Do you know whether on one occasion he asked me to see Mr. Bagge and talk the matter over with him, and to endeavour to bring him round to Mr. Hickson's view? I do not remember that.

12979. *Mr. Carter.*] Referring to lump sum tendering, are you aware that in outside practice the adoption of lump sum tendering leads to grave disputes arising out of claims for extras, compensation, and so on? I should say so, decidedly. I know as a matter of experience that it is so. When a lump sum tender is accepted in the Public Works Department there is always a schedule attached to it containing all the work in the contract, so that if any additions are made they may be paid for at the schedule rates attached to the contract, and so that if any deductions are made the lump sum might be reduced by the quantity multiplied by the rates attached to the contract.

12980. Have you heard that the Metropolitan Board of Works in Victoria has adopted the same system of tendering? Yes.

12981. *Mr. Parkes.*] When was that? I cannot give you the particulars, but it was at a comparatively recent date.

12982. You heard of it incidentally? Yes.

12983. When did you hear of it? A short time ago.

12984. A month ago? It may have been longer, or it may not have been so long; but it is not a long time ago.

12985. *His Honor.*] As to the question of taking advantage of the clause enabling the engineer to vary the work, I understand that you consider that the engineer has no right to vary the work merely for the purpose of putting the contractor on to his low items and off his high items, the quantities having been originally shown him before he tendered? That would certainly be a very unjust course.

12986. *Mr. Norrie.*] Might not the clause lead to a great deal of abuse if used in that way? Undoubtedly.

12987. *Mr. Parkes.*] But should the clause be used for the elimination of all the cheap items and the acceptance of all the dear ones? I say that it is improper to bring that clause into the question at all. The duty of the engineer, so it seems to me, is to disregard the prices altogether as far as possible and to administer the work according to the quantities given and the items of the schedule.

12988. Of the schedule of the Department? Of the schedule accepted by the Minister for Works. If the Minister accepts a schedule and subcontracts have to be carried out, and if the contractor has a bad price for them, so much the worse for him.

12989. *Mr. Norrie.*] Clause 16 is only used when certain contingencies arise? Yes; where alterations are required and where those alterations necessitate omissions or reductions of a minor description.

John Moore Smail sworn and examined:—

12990. How long have you been an engineer upon public works? Since 1875.

J. M. Smail.

12991. Have you been always engaged in sewerage works? I have been engaged upon sewerage and hydraulic works for nearly thirty years.

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12992. You were at one time with the City Council? Yes.

12993. When were you transferred? I resigned from the City Council and joined the Government Service in 1875. I was transferred from the Public Works Department to the Sewerage Board on the formation of the Sewerage Department under the new system.

12994. On what date was that? In 1889.

12995. You have since that date carried out your duties independently of the Public Works Department? Yes; the Board carry out certain portions of the work, and the Government Construction Branch carry out the other portion.

12996. What was your system of tendering under the Water and Sewerage Board? The same system as that in vogue in the Public Works Department when I left it.

12997. What was that? The schedule rate. We gave the quantities, and the contractors would fix their own rates.

12998. When was the change made from that system? We made a change about two years ago—on the 7th July, 1894.

12999. Did you submit the proposed change to your Board? Yes; the matter came up in this way. We had two contracts at the Glebe, and we had, upon the best information we could get as regards strata, fixed

- J. M. Smail. fixed the quantities of soil and rock excavation. Two contractors evidently knew more of the locality than did the officers of the Department, and they fixed their prices in such a way that they had a very small price for rock, and a very handsome price for soil. The consequence was that, before the work was completed, we had over-run what you might call the bulk sum. I then drew the attention of the Board to the matter. I said that it was only fair to contractors that they should be paid at their schedule rate for soil, because if it had turned out that much excavation in rock was required it would have cost them 30s. a yard, whereas their price was 6s., and they would have had to carry out their contract. It was just a stroke of luck that they knew the strata better than did the office. It was to prevent such rigging as that that I fixed all the prices at what the contractors were to tender, and tenders were received at par or at a percentage above or below. Since then we have had no trouble.
13000. Have the correspondence or minutes between yourself and the Board been kept? There was just one report, which I forwarded to the Board.
13001. Did you originate that report? Certainly.
13002. It came from you alone? Yes. Of course the district officers may have drawn my attention to the matter.
13003. But it emanated in your office? Yes.
13004. Would you have the papers in the matter? Yes, I dare say they could be produced.
13005. And your report? I presume so.
13006. Then as a matter of fact you did not get instructions from the Public Works Department that you were to carry out this new system? No.
13007. You are the sole originator of it? I was not the sole originator. I was simply copying the practice which we had had in the Water Branch in the laying of mains by contract. The items there were comparatively few, but it was considered that we might apply the same system to larger contracts.
13008. How long had you been using the system? It had been in use in the Water Branch for three or four years before I introduced it into the Sewerage Branch. It was not a new thing, and I do not claim any originality for it.
13009. Who was in charge of the Water Branch? Mr. Trevor Jones. I succeeded him. He was at that time engineer for water, while I was engineer for sewerage.
13010. Had he used it for some time as engineer for water? I think so. The prices were fixed for rock and soil, or whatever the item might be, and the contractors had to tender at par or above or below those prices.
13011. When you submitted the matter to the Board who were present? The whole Board, I presume.
13012. In the general administration of contracts is it not possible for the engineer in charge of the work to prevent the contractors from getting the best of him? The engineer generally tries to prevent the contractor from getting the best of the Department.
13013. It is in his power to do so? Yes. It is his duty. At the same time it is his duty to see that the contractor gets justice.
13014. He can do so under the contract? It depends upon how the contract is drawn. If the contract is drawn equitably the contractor would have the right of appeal against the district officer if he thinks that officer is not treating him fairly.
13015. You have had no difficulty under the new system? No.
13016. Even under the old system of schedules you had no difficulty then? Our trouble was to get the extra money, and that was the only trouble we had. We had no trouble with the contractors. There was the schedule rate, and the material had to be paid for according to that rate. The contract was for the contractor as well as for the Department. The contract was at schedule rates, and the contractor was bound by it just as much as was the Department.
13017. If you found any glaring absurdities in the schedule, had you not the power to eliminate them? No; they were schedule rates. As a matter of fact we had some very glaring instances. I think in one case 1d. a yard for rock was put in. That, of course, was absurd; in another case a man put in £500 for maintenance, and put in an absurdly low price for all the items.
13018. But if he put in 1d. per yard for rock he would have to carry it out? Yes.
13019. In the cases to which you refer you carried out all your schedules;—you have not had a number of schedules containing items which you have not carried out? Of course, some items are put in for contingencies, and if the contingencies do not arise they would not be used.
13020. But they are put in only for contingencies? That is all; in fact I do not know why superfluous items should be put in. The specification is gone carefully through, and the schedule items are drawn out in accordance with the specification.
13021. In your work have you abided by your own quantities solely? They come out pretty fairly. Sometimes there will be a surplus of rock, and in that case there will be less soil; the one thing will balance the other. There has been no very marked discrepancy except in the two or three contracts to which I have alluded.
13022. What is your present position? I am chief engineer in the Water and Sewerage Board.
13023. When did Mr. Jones leave the Service? He has not left the Service yet; he is engaged in the Department. He ceased to be water engineer in the early part of 1894. He was given twelve months leave and I took over his Department. I have been in charge of the Water and Sewerage ever since.
13024. Did the report which you put before the Water and Sewerage Board, as to the tendering, contain details? I referred to particular contracts, and in my recommendation I said that a certain course would have to be adopted.
13025. Did you use any illustrations drawn from methods of contracting in use elsewhere? No; I simply dealt with the method which we had been following in the Water and Sewerage Branch for years, I found that it would not suit, and I said we should have to introduce something new.
13026. Do you know if the system you suggested was in use anywhere outside of the Colony? No.
13027. You do not know whether it was in use in Melbourne. No.
13028. As to Williams's contract, it was pointed out the other day, I think, that Williams really had been paid for rock where mullock occurred? That is not so. It was his contract which brought about the change of system. I fixed the quantities of soil and the quantities of rock from the best information I could get without going to the expense of boring.
13029. No bores were put down? No. We worked up to the quantity of soil, and we found that the quantity of soil was being exceeded. When we balanced the items we found that as regards soil we were

were very much on the wrong side. When the contract was completed we found that there was 75 per cent. of soil instead of 50 per cent. of soil. Mr. Williams' superior knowledge of the district enabled him to fix up and rig his schedule to his advantage, and to prevent this in future I recommended the Board to alter the system and adopt the percentage system. J. M. Smail.  
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13030. How much did Mr. Williams make by that arrangement? Contractors never [make money, you know.

13031. But what was the difference? He got about £4,000 above the bulk sum of his tender.

13032. When you altered the system you communicated with the Public Works Department? No; I think Mr. Hickson and I had a conversation. He was a member of the Board at the time.

13033. Did he send for you? No.

13034. Did you put the matter before him? Mr. Hickson, as I have explained, was a member of the Board at the time, and when my recommendation went down to the Board Mr. Hickson, as an advising member on sewerage matters, would take the matter up. I believe the system was afterwards introduced into the Government Construction Branch. That is as far as my recollection serves me.

13035. *Mr. Davis.*] Are you quite sure who introduced the change first—the Water and Sewerage Board or the Department of Public Works? I am perfectly sure of what I say—that the system was actually in existence in the Water Branch years before I adopted it in the Sewerage Branch.

13036. You are sure of your facts? Yes.

13037. Would you not be surprised to find that a tender was received in the Department of Public Works on the new system in March, 1894? I should be very much surprised. It is the first I have heard of it. The final voucher in the Glebe contract was signed on the 27th November, 1894. That was when the trouble arose, and when the new system was introduced, as far as our sewerage work was concerned. I should be very much surprised to find that Cook and Webb's contract, to which, I suppose, you refer, was accepted in March, 1894.

13038. You have frequently visited Ahearn's contract, at Arncliffe—I mean No. 101? Yes; about three or four times, when I was acting Engineer-in-Chief.

13039. Did you observe any cracks in the concrete? Yes.

13040. Were there many? I never counted them.

13041. Did you regard them as serious? You mean to the stability of the structure—no.

13042. You would say that they were of no consequence, as regards the utility of the sewer? I should say they were not. You will find similar cracks in the other aqueduct on the other side of the farm. I remember that I wrote a report to the Minister upon that matter.

13043. The same thing which occurred in the concrete on the Botany side of the farm has occurred in the concrete on the Arncliffe side of the farm? Yes; there are hair cracks—cracks due to the contraction of material.

13044. Would you say that such cracks might be expected in a structure of that description? I should think so.

13045. I suppose you would go so far as to say that they are unavoidable? There is no doubt about that. I have seen few concrete structures in a mass like that without them. It would be surprising if you found no cracks.

13046. As to the horizontal crack running along the aqueduct at the springing of the arch of the sewer, to what do you attribute that? It occurred to me, from looking at it, that it might be the partition between two pieces of concrete work; one having been put down at one time, and the other being put in afterwards. One has drawn away from the other. The same thing is visible in the old carrier as well as in this one.

13047. *Mr. Parkes.*] It is due to the want of a grouting joint? In Mr. Young's contract, on the other side of the farm, where the grouting was carefully done, the same thing occurred. It might be due to variation in the temperature—for instance, if the first lot of concrete were put in on a warm morning, and if it were chilly in the afternoon, contraction would take place.

13048. *Mr. Davis.*] The contract on the other side of the farm was carried out by Mr. John Young. Yes.

13049. Do you think the cracking is due to there being bluestone concrete in the invert of the sewer, and sandstone concrete in the arch? That might have something to do with it. One would be richer than the other, and they would have a tendency to draw apart more than if there were one homogenous mass of bluestone concrete.

13050. *His Honor.*] The upper half of the sewer would contract, with a falling temperature, at a faster rate than the lower half? Yes.

13051. Not being so rich and being also sandstone instead of bluestone concrete it would contract more for a similar fall of temperature? Yes. The stone in the sandstone concrete would be more porous than the stone in the bluestone concrete. Then there is a general contraction of the material itself.

13052. Would that be due to a general contraction going on gradually or to the ordinary contraction following upon the low temperature on cold nights? No; I think there is a natural contraction as well. That might be increased by a wide range of temperature.

13053. There is a natural contraction in the concrete after it has set? Yes; there is no doubt about that.

13054. Quite apart from changes of temperature? Yes. I am speaking now from actual observation of the carrier which is on the older part of the farm. A crack appeared there in which it was quite possible in winter-time to insert your pen-knife. In summer-time you could not find that same crack. That demonstrates that there is expansion and contraction going on between the two segments of concrete.

13055. That would show really that change of temperature was the cause of the cracking? Yes. There is a natural contraction in the concrete itself when setting.

13056. But after setting does the concrete contract apart from changes of temperature? I should say that in this case the cracks were probably due to the two descriptions of concrete. The crack thus caused would open and shut in winter and summer.

13057. That would show that there is an unequal contraction and expansion going on from changes in temperature only? Yes.

13058. There is no general contraction of the whole body? No; I think not.

13059. You have seen the other cracks—those peculiar cracks over the crown of the arches in Contract 101 all drawing the same way—do they not indicate a general contraction from the north-west end, as if

J. M. Smail. that end were fixed, and there were a general dragging by contraction, the whole of the upper part of the structure contracting more than the lower part? It might be attributable to the unequal contraction and expansion of the upper part as compared with the lower part. There is a free end as far as the superstructure is concerned, but not as far as the arches and piers are concerned. One part being free, there would be a tendency for it to go that way.

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13060. *Mr. Davis.*] Would not the shape of the cracks, which have been described by His Honor, be due probably to the junction of lengths of concrete? Yes; the cracks appear to follow the line of the stepping. It actually occurred in the main carrier which was put in over ten years ago with bluestone concrete.

13061. It open and shuts? Yes.

13062. *Mr. Parkes.*] What becomes of the liquid? The carrier is on the farm, so that it really does not matter. When the sewage gets into the carrier it will make the temperature more equable. The slime gets into the slight cracks and fills them up in time.

13063. Has that happened in the other case? Yes, the cracks extend down towards the invert, but they do not go through the invert. I have seen no sewage coming out.

13064. That carrier is partly underground? No, the part referred to is all above ground; in one part it is 12 feet from the ground to the top of the side wall.

13065. What length would it be? From 80 to 90 feet.

13066. Not half a mile? No, but the same principle applies. The sewer is built upon the surface of the sand.

13067. *His Honor.*] Supposing that carrier had originally been built in such a way as to allow of motion at intervals of about 82 feet, there being elastic cross-joints put in? I do not think it would make much difference. You cannot say in respect of any arbitrary segment of concrete that it will expand or contract. You may have an expansion joint at one particular point where through unequal setting there may be hair cracks.

13068. But it would allow of motion afterwards? Yes, but very slightly; you cannot get free of cracks.

13069. These cracks existing in the blocks of material would probably crack the rendering? Yes.

13070. If the rendering had been put on after the cracks had shown themselves? Yes.

13071. *Mr. Davis.*] It has been stated that the only thing that can be done with Contract 101 is to remove the upper part of the structure down to the invert of the sewer, and to substitute in place of the concrete an iron pipe; do you consider that that is necessary? No.

13072. What would you say as to such a proposal;—would you say that it was money well spent or money thrown away? I should say that it was money wasted.

13073. Because in your opinion the substitution is unnecessary? Yes; I do not see that there is any need for it.

13074. In the original contract a bank was shown to cover the sewer, but it was not carried out in construction, it being thought unnecessary? Well, if it were not necessary in the one case it would not be necessary in the other.

13075. Going to Contract 64, the aqueduct between Rocky Point Road and the Illawarra railway, what do you think of the small cracks there at the base of the spandrels? I look upon them as atmospheric cracks. They are not structural defects.

13076. *Mr. Parks.*] What about the one which goes through the centre longitudinally? I saw no such crack.

13077. *His Honor.*] There is a crack in the centre of each pier excepting one? All the cracks I saw were at the springing of the arch as if there were a lifting up of the concrete. I did not see any transverse cracks. I remember seeing one crack that had been filled up, but it did not go round the intrados of the arch. Considering that these piers are on thirty piles right down on the rock, and that there is no lateral movement to speak of; I should say there is no fear as regards the stability of the sewer.

13078. You do not say that the crack to which you refer necessarily passes through the invert of the sewer at all? If so, you would find it in the intrados of the arch, but the arch seems to be perfect. I should say, however, that I was there on a very wet day. I do not think the crack to which Mr. Parkes has referred extends right up into the invert of the sewer.

13079. *Mr. Parkes.*] Do you know whether that crack has been filled up lately? I could not say.

13080. *His Honor.*] The sewer is not yet in use? No.

13081. You think that sewage passing down a carrier which has some cracks in it, providing the cracks are not large open cracks, will actually fill them up? Yes. We have known it to occur in other instances.

13082. Instead of the various organic acids acting upon the concrete and destroying it, you think that practically the effect will be that the cracks will fill up? The slime that comes down with the sewage does not appear to have any effect on the concrete. Of course if there were any large crack it would have to be cut out and filled in with some give and take material. I would recommend that as regards No. 101, nothing should be done to the structure until the summer comes, when probably a number of the cracks which are now visible will disappear.

13083. But will they not open in the ensuing winter? We want to see whether they are fixtures, or whether they are due to expansion and contraction. As far as I can see they are atmospheric cracks.

13084. *Mr. Carter.*] Referring to the subject of schedule prices, you gave an instance this morning of an extraordinary price of £500 being put in for maintenance in connection with one contract;—did you contemplate interfering with that item;—did you not pay it as a matter of course? I do not think the tender was accepted.

13085. Supposing the tender had been accepted, would you have interfered with that £500? I do not know what I might have done.

13086. It is not the practice to do so? No, we take the schedule as it stands. The contractor has to abide by it.

13087. *Mr. Parkes.*] Had there been 10 yards of bluestone pitching provided in a schedule at £50 a yard, would you have paid for 38 yards at the same rate? If I were convinced that there had been an error on the part of the man who took out the quantities, and that the work were actually required, I should take it at schedule rates and pay for it at schedule rates and no more.

13088.

13088. At £50 a yard? Of course, it seems a very high price.

13089. *His Honor.*] Did you notice the price of £50 a yard for bluestone pitchers? It was brought under my notice,

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13090. Do you know what happened in regard to that item? The information I got was this—that the item was put down at £50 a square yard, and that only 12 square yards were put in the schedule. Of course, quantity surveyors and engineers are as liable to make mistakes as are other persons, and sometimes quantities may be a little understated, and sometimes a little overstated, not from design, but from accident. As regards the 12 square yards of bluestone pitching, I knew from the number of manholes that more than that quantity would be required. I made some inquiry in reference to the matter, and I was given to understand that the Engineer-in-Chief had settled it in such a way that no alteration could be made afterwards. I was only the *locum-tenens* for the Engineer-in-Chief, and I had to accept the lines which had been laid down in the first instance. The work had been going on for months before I took charge of it.

13091. The manholes had been put in? Yes.

13092. And you did not know whether a series of mistakes were made in regard to this matter? No.

13093. At any rate, you came in too late to remedy any mistake? Yes; whatever agreement there may have been between the contractors and the Engineer-in-Chief I could not alter it.

13094. *Mr. Davis.*] Although the price was so manifestly ridiculous, and although the quantities were probable quantities, these pitchers were shown upon the drawings;—would you consider the decision arrived at by Mr. Hickson to allow the contractors to put in what were shown on the drawings to be unreasonable? If the pitchers were shown on the plans, and the plans were exhibited to the contractors, they would have a fair claim to them.

13095. *His Honor.*] You think that the drawings must stand, and the schedule fall, if the schedule evidently shows a mistake; in other words, you think that what is shown on the drawings must be taken as the contract, and not that which appears in error in the schedule? If the plan showed fifty manholes, and each manhole took a yard, there must manifestly have been an error in the schedule. The contractor was clearly entitled to go by the plan, and not by the schedule. Very often, when extra manholes are wanted, it is the custom to pay for them at the rate shown in the schedule, of course. The contractors' engineer will frequently endeavour to get a higher price for the extra quantities. So far as this particular contract is concerned, I believe, speaking from memory, that a large quantity of timber which was used had to be left in the trenching. The contractor got 1d. a foot for it, and I am confident that it must have cost them thirty times that price.

13096. *Mr. Parkes.*] But do you know that they got 5s. a yard for cement rendering? Some of the cement rendering would be honestly worth it from the position in which it had to be put—for instance, a rush of water might come down and destroy a whole day's work.

13097. But if there were subducts you would not have a thing of that kind happen? I believe subducts were left out of this particular contract.

#### MONDAY, 17 AUGUST, 1896.

Christian Herman Ohlfsen-Bagge recalled and further examined:—

13098. *Mr. Parkes.*] Were you in the habit of making up all the schedules for sewerage contracts before you left the Department? I made up all the schedules from the date of No. 3 Contract.

13099. Did you prepare the schedules yourself or were they prepared by the officers of your Department? I generally prepared the schedules myself; but the quantities were taken out by a regular staff. I used to inspect the quantities.

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13100. Who put in the prices? They were put in virtually by all of us. For instance, I looked to Mr. Davis to inform me carefully of what changes had taken place in connection with outside work, because I had nothing to do with that. Then we had a consultation about the prices in vogue at the time, and the schedule was drawn up accordingly.

13101. In connection with which contract was that? That applies to all contracts. As each contract came out we had a consultation, because the prices were constantly altered.

13102. What was your position in the Department? I held the position of principal assistant engineer. I was nominally in charge of the whole of the work; but, as a matter of fact, I had nothing to do with the outside work. That was undertaken by Mr. Hickson and by Mr. Davis, acting under him.

13103. What was Mr. Davis' position? He was supervising engineer. He first came to us as a draftsman in the office; but he could not make headway in that capacity, and he applied to Mr. Bennett to send him outside on account of ill-health. He was thereupon sent to the Bondi sewer, under Mr. M'Mordie, as an assistant. Afterwards, when the Water and Sewerage Board were appointed, they took my best men—Mr. M'Mordie, and Mr. Smail, and others were taken away. My branch was reduced to a certain number of hands, and Mr. Barling at that time was very anxious to have Mr. Stayton in my place. Mr. Bennett, however, opposed that course. When Mr. Hickson took charge he one day said to me, "Mr. Barling says there ought to be three Bagges in your position instead of one. It is absurd that you should be responsible for the whole of the work. What do you propose?" I said, "The only thing I can suggest is that the work should be divided, I remaining in the office in nominal charge of the whole work, and supervising all the designs." Mr. Davis being the only one of the higher officers left who had any knowledge of the outside work, nothing was left for me but to recommend him so far as that part of the work was concerned. Mr. M'Mordie had left us, otherwise he would have been entitled to the position; but, he having left us, I recommended that Mr. Davis should be supervising engineer, and that Mr. Mollison should be chief surveyor. That proposal was accepted by Mr. Barling, as far as I understood, and under that arrangement we started our work. If I had had other officers in these positions I must have obtained them from outside, but sewerage work is of a peculiar kind, necessitating the employment of clever men, who know what they are doing. I therefore said to Mr. Hickson "If we take outsiders they may run us into a lot of trouble during the next year." He said "You are quite right—we will take Davis and put him in charge of the outside work." I spoke to Mr. M'Mordie about Mr. Davis, and I also spoke to Mr. Smail about him, and they said that it would be far better to take him than to take an outsider. You can well understand that the supervising engineer, having regard to the complicated nature of the work we were undertaking—architectural work, work in connection with steam engines, tunnelling and storm-water channels—would require to be a man thoroughly versed in designing and construction, and *that*

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Mr. Davis was not. There lay the difficulty. Many of the troubles which arose were from blunders in connection with supervision. Mr. Davis charged me to Mr. Hickson with those blunders, and several times I had occasion to say to him "If I were allowed to see these works whenever I thought I ought to see them, I could prevent much trouble." He said "You can go and look at them whenever you like." That was all very fine; but my position was in the office. My outside functions were merely nominal, and I was not taken out to the works when I ought to have been taken out. It was Mr. Davis' duty to have come to me and said "Come out; we are in trouble about this or that." Had he done that I could have prevented a lot of trouble.

13104. Do you recollect the compilation of the schedules for Contracts 69 and 79? Yes, I recollect one of them. If you are referring to the contract in which some of the contractors rigged their tender so extraordinarily. [*Vide Appendices Nos. 44 and 45.*]

13105. Was that the first case of rigging? I do not mean to say that it was.

13106. Why do you say that some of the contractors rigged their tender so extraordinarily? I will tell you. The schedule of prices was in vogue in Victoria, and when I came over here I found that it was also in vogue here. Mr. Bennett would not have the system altered, although in course of time I improved it as much as I could. Experienced contractors, however, were finding out certain items upon which there would be sure to be increases. They would say, for instance, "The Department cannot calculate this item correctly. There is bound to be an increase." They would then put down a stiff price in connection with that item. Experienced contractors acted in that way until we reached, I think, Contract 79 or 69. In connection with that contract they put in an immense price for shaft excavation. I remember going to Mr. Hickson with the tenders at the time, and saying to him "These figures are most extraordinary. If any strange contractors had tendered for the work at such prices I should have said these gentlemen will sink their shaft and then they will take off their hats and say, 'Good morning; you can get the rest of the work done by someone else.'" Of course, Carter, Gummow, & Co. are an old firm, who have done a quarter of a million pounds worth of work for us, and I can well understand that they would have no intention of dropping the work. Still there may be trouble in the money market in the getting of money, and my opinion is that they are simply endeavouring to raise money out of this part of the contract with which to complete the remainder of the job. I told Mr. Hickson further, that I thought the tender ought to be sent back to Carter, Gummow, & Co., with a request that they would re-arrange their prices in proper proportion, not exceeding the sum total of the contract. Mr. Hickson, however, said that would not do, and that we must stand by the prices. I told him that in Victoria a contract such as that would be returned to the contractor with a request that he would remodel his prices. I remember that when this rigging occurred in Victoria the district officers of the Public Works Department reported the matter to Mr. Wardell, Inspector-General of Public Works, and complained about the practice. The matter was sent to the Crown Solicitor, and that officer wrote a minute to this effect: He said that the engineer was responsible to his employers for the work being carried out within the sum tendered, and that if, therefore, a contractor gave speculative prices upon certain items, he should not be paid those speculative prices, but must be allowed only so much, permitting of the remainder of the work being constructed within the amount of the contract if an emergency should arise. We acted accordingly in Victoria, but Mr. Hickson said "We cannot do that. That will not do. If the prices are fixed we must pay them." I remember saying to Mr. Davis at the time "It is all very well for Mr. Hickson to say that, but we do not know what may occur. We cannot tell what trouble there may be in store for us. Don't you pay the full quantities, whatever you do; be sure to keep sufficient money in hand to cover the contract." That, I honestly believe, Mr. Davis did. I remember his saying "You need not feel afraid; I do not return the full quantities. I always keep sufficient money in hand to render us perfectly safe." Mr. Davis acted in such a way as to protect the Department. The work was carried out at the prices which had been given by Messrs. Carter, Gummow, & Co., although I thought, as I have already explained, that they had no other intention in view but that of raising sufficient money out of that part of the work to carry on the job. It must be borne in mind that there was at that time a difficulty in getting money.

13107. Do you recollect whether Contract 79 was let in March, 1892? It would be somewhere about that date, I think.

13108. Contract 69 was let in 1893, twelve months afterwards, was it not? I believe so.

13109. In connection with Contract 69, do you recollect an item of £50 for bluestone pitchers in Carter, Gummow, & Co.'s schedule of prices, and do you also recollect a certain uniformity of price in connection with other items in their schedule? I remember drawing Mr. Hickson's attention to the extravagant price in connection with the bluestone pitchers.

13110. Did you point out that to Mr. Hickson before the tender was accepted? Yes; whenever a tender came to me and I saw there was any incongruity in it, or that it contained anything out of the common, I at once spoke to Mr. Hickson about it, and drew his attention to the matter. In this case I remember Mr. Hickson's saying "Well, I do not see how we can alter that unless we can substitute something else for it." The thing happened a comparatively long time ago; but I distinctly recollect speaking to Mr. Hickson about it, and I remember his saying that the thing could not be altered. If I remember rightly, there was some mistake in our quantities in connection with that very item. It is possible that the contractors may have found that out, and that that is why they put in such a high price in connection with the item.

13111. You are referring now to the bluestone pitchers? Yes.

13112. Have you any idea of how the mistake occurred? When work like this is rushed—when quantity surveyors are rushed in this way—slight errors may creep in. It would be almost impossible to avoid them.

13113. You have no doubt that an error was made? I think it was an error—in fact, Mr. Davis afterwards told me that we did not give a sufficient quantity.

13114. If you count the shafts shown upon the plan, you will see at once that a mistake must have been made? I am quite sure that there was a mistake.

13115. Have you seen before the plan now exhibited? Yes. I distinctly recollect Mr. Davis, telling me that there was an error in the quantities in connection with the item of bluestone pitchers.

13116. Did that occur previous to the letting of the tenders? No, afterwards.

13117. But you had a conversation with Mr. Hickson about the price of £50 for bluestone pitchers before the tender was accepted? Yes.

13118.



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13118. Do you remember the effect of that conversation? Mr. Hickson said "We cannot help ourselves." He seemed to have a fixed idea that when a tender was given in, no matter what the prices were, we must pay according to those prices. In Victoria we did not do that. We used to send the tenders in such cases back to the contractors, with a request that they would remodel their prices, so that in the aggregate they would not exceed the sum total of the contract. If the contractors had not done that they would not have got the contract.

13119. You will see from the plan that there are twenty-four shafts in the main line of sewer? Yes.

13120. How many would there be in the branches? Four or five.

13121. Evidently that would take more than 12 yards of bluestone pitching? Yes, decidedly.

13122. When was the mistake found out? It was found out during construction. To the best of my belief, Mr. Davis one day told me that a mistake had been made in the quantities. I think he suggested on one occasion that bluestone concrete should be used around the manholes, so as to reduce the expenditure. I think he did his best at the time to reduce it.

13123. What actually took place after that;—what course did you take? To the best of my belief, we paid for pitching, where it had to be done, at the contractor's price.

13124. Were you compelled to do that? According to Mr. Hickson's idea, we were compelled to do it.

13125. The tender of Carter, Gummow, & Co., in connection with Contract 69 was a most startling instance of rigging, was it not? It was the greatest event of the kind in the way of tendering that I ever saw. It caused a sensation afterwards; and from that moment Mr. Hickson began making alterations in the schedule. There were, as far as I can recollect, one or two alterations before the matter was finally settled. We used to consult about the matter. He sometimes sent for me; and when the Board of Reference were appealed to they finally decided upon the latest mode of tendering. I recollect that, at the time, I said to Mr. Davis that this thing was not new to me, because, in 1844, all works in Germany were tendered for upon exactly the same kind of schedule, except that we had no specification, each item specifying the work comprised in it. The prices for the different kinds of work were published in a technical journal every morning. The contractors tendered at a certain percentage above or below rates, or at par. I thought at the time that the system might give us some trouble. At the same time, I think the schedules which were afterwards drawn were the best which could have been adopted, under the circumstances, with a view to prevent rigging.

13126. But there is no absolute obligation on the part of the Department to accept the tender if it looks suspicious? No; but they always do so here. The lowest tender is always accepted unless the contractor throws it up. In Victoria, if there were any incongruous prices in a schedule, the contractor would be expected to remodel it as I have already explained.

13127. Will you tell His Honor what experience you have had as an engineer, both at Home and since you came to the Colony? I commenced as an engineer in the North German Railway Department. Before I started I had, as is the invariable rule in Germany, to learn a trade belonging to the profession. I learnt the trade of a mason and bricklayer. It is necessary also to pass an examination, and in the evening when you have been at work all day upon the scaffolding you have to attend a technical school. Until you have passed your examination as *conducteur*, as it is called, you cannot be employed by the State. In the winter season you have to attend lectures at the University. In my case I attended lectures at Hanover and Kiel.

13128. After you became a master engineer, what works did you carry out? We built one of the lines through the Marsh-lands, 75 miles in length. I was then ordered to the Department of Inspector-General of Dykes. I ought to explain that these dykes protect the land from the German Ocean. I was there eighteen months, drawing all the railway crossings on the dykes according to instructions from the Dyke Department. I had afterwards to go back to the railway office and prepare the necessary work in connection with the dyke crossings. After I had been there for three years or so I went to Great Britain, and at Glasgow I was under Mr. Neil Robson, one of the principal engineers there, and I carried out some waterworks for the Duke of Hamilton. At the end of 1847 I went Home and entered the army, and at the end of 1848 I went with a number of others to South Australia. We chartered our own ship and I came to Australia, landing in Adelaide. There I started surveying and architecture, and on the discovery of the goldfields in 1851 I came to Victoria. I then went to Governor Latrobe with a gentleman who had once been Colonial Secretary in Adelaide, and I obtained an appointment as chief clerk of works on the goldfields. I there had to build all kinds of works, and I was engaged in that way for about eighteen months. The head-quarters camp, as it was called, was then abandoned, and I started practice in Melbourne. I was in practice there for about six years, and I then entered the Victorian Railway Department. I was on the eve of getting a good appointment there when some 200 officers of the Public Service were all turned out. During this time I had to do some work for the Chief Assistant Engineer for Public Works, and Mr. Wardell told me that he would endeavour to get me a good departmental appointment. He said I must pass the examination as a water and sewerage engineer, and I did so. I subsequently obtained an appointment as engineer for the Ballarat district, the best goldfields district in the Colony. During the time I held that appointment we constructed all the goldfields reservoirs. My reservoirs all stood, whereas reservoirs which had been built by other gentlemen all washed away. Finally they handed over to my charge the whole of the reservoirs, and I had to reconstruct those which had been washed away. I completed about forty-six schemes of water supply. Mr. Wardell told me not to go away, as there was plenty of work for a man of my stamp. He said, "Immediately I see a good appointment you shall have it." I remained in the Public Works Department, having very little to do in the old water branch, when the Chief Assistant Engineer one day asked me whether I would draw plans for a graving dock. I offered to do so, and I subsequently did that work. I afterwards went to the Ballarat Waterworks. I carried out those works, and following upon their completion came Black Wednesday, when I came to this Colony.

13129. Since then what have you been engaged in doing? I had letters of introduction to Mr. Copeland and Sir John Robertson, and I was promised the post of Resident Engineer on the railways. I was afterwards told that I was wanted at the Sewerage Office, and that I must go to Mr. Bennett.

13130. How long have you been in the Government service here? Fifteen years.

13131. During that time you have carried out a good deal of sewerage work? Yes.

13132. In carrying out the works you have enumerated, I suppose you have had considerable experience in concrete? I have during the whole of my life been engaged in large works, and when I say that, you can understand that I have had as much experience in concrete structures as any man living during that period could possibly have had. I have been continuously at work. I think I have built everything which could possibly be drawn.

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13133. What is your opinion of concrete used in long lengths above ground in any sort of work? My experience is that if bluestone concrete of a certain thickness is put in it will stand better than sandstone concrete. I do not like sandstone concrete at all for sewerage work; but we have here not only to combat difficulty of construction, but we have also to keep in view the necessity of constructing the works as cheaply as possible. Frequently we have put in walls as thin as our calculations would permit of their being made, whereas we should in many cases have put them thicker except that it would have increased the expenditure upon the work very much.

13134. When you were last examined you spoke of a concrete aqueduct at, I think, Rose Bay? Yes.

13135. Did the concrete in that work crack? Yes. I was living at the time at Darling Point, and, speaking from memory, I took the sewer to be the Rose Bay branch. I remember Mr. Davis coming to me and saying "You ought to see that work." Not only was the archwork unsatisfactory, but we found that the lining of the sewer was practically sand instead of mortar. Mr. Davis was very much annoyed, because he said he had put there the best foreman he had. I remember his saying "It just shows how persons may be mistaken in these things." I said "Thank goodness the work is not underground, or you might never have seen it again." I think I am right in saying that the foreman was afterwards dismissed.

13136. What was the size of the cracks in the concrete work? There were not merely cracks; some of the work had tumbled down altogether. As regards the brick lining, I remember putting my penknife in and finding it all sand in the joints.

13137. Did you make the plans for Contract 101? Yes.

13138. Did you make them yourself? No; but I gave instructions for them to be made.

13139. What was provided in connection with that contract—what description of work? I have been thinking over Ahearn's contract since I was last here. I have made a few notes which may, perhaps, throw some light on the matter. They are as follows:

*Contract No. 101.*

For this contract Mr. Stayton also designed an embankment, as viz. :—

The low ground (area of Sewerage Farm) was to be raised 5 feet above high-water level with sand-filling, upon which he proposed to build the triplicate sewer, and this was to be covered with an embankment.

2. To build the sewer on this sand-filling would, however, mean constant settlement, sufficient to crack all the work.

3. To avoid this the sewer for this contract was designed to be carried by low flat 20 feet span arches on piers with stouter (abutment) piers at regular intervals. On completion of the sewer, a strip of the Sewerage Farm to be filled up on both sides of the sewer 5 feet high, and upon this the embankment covering the triplicate sewer to be raised.

4. Instead of this Mr. Hickson ordered the lower filling and the embankment to be left out, and the sewers (which were designed to be built of bluestone concrete) to be built the lower parts only of bluestone concrete, and the upper parts (the closing arch) of sandstone concrete, covered on top with a thin layer of asphalt.

5. The embankment was, therefore, erased on the contract plan and the asphalt covering substituted as ordered.

6. I informed Mr. Hickson at the time that the work would crack, but he said it would not.

7. Pile foundations were also designed to be executed upon all bad ground, but Mr. Hickson objected to any piling, as, in his opinion, simply a waste of money. I remonstrated with him, and at last he permitted me to provide for it in the specification and in the quantities, to be executed when ordered.

8. Therefore if Mr. Hickson did not order any pile foundation on bad ground the responsibility rests with him.

9. It has been reported to me that this work has cracked badly; if so, it is due to settlement, expansion, and contraction, for which Mr. Hickson and Mr. Davis are solely responsible.

13140. Supposing the piers have not sunk at all? Whether that be so or not the work has cracked.

13141. But supposing the piers have not sunk, what would the cracking be due to? The sandstone concrete and the bluestone concrete act differently. There is a different contraction and expansion in the two kinds of concrete. It was a mistake, I think, to put in the sandstone concrete, merely because it was cheaper. Even if the foundations had not given way the concrete was bound to crack from the unequal contraction and expansion of the two kinds of concrete.

13142. When you built the reservoirs at Ballarat, to which you have referred, at the time when the other reservoirs had washed away, of what did you construct them? There were earthen dams and some concrete embankments.

13143. Was there concrete with puddling at the back? No; it was pure concrete work.

13144. Did the reservoirs hold water? They were as tight as drums.

13145. What was the thickness of the concrete? In one case it was about 5 feet thick at the top.

13146. Will concrete hold water? If the work is properly done.

13147. Was the plan No. 101 which you see before you made under Mr. Stayton or under yourself? That is the plan as ordered by Mr. Hickson to be carried out. The work was to have been covered in with an embankment.

13148. Will you explain what alterations were made? The work was intended, as I have just stated, to be covered by an embankment, because, if the sewage farm were raised 5 feet, it would leave the work just on the surface, and, it being such a long structure, it was considered unsafe to leave it exposed to the weather unless it were constructed in a totally different manner. Mr. Hickson said it was plenty thick enough, and that we were far too extravagant. He therefore cut down the bluestone concrete at the top, and put in sandstone concrete in its place for cheapness. The side walls, if designed in accordance with similar work exposed to view at the farm, should have been 1 ft. 9 in. in thickness, whereas they are only 1 ft. 4 in.

13149. Did you draw the specifications for Contract 101? Yes.

13150. Why did you insert clause 175 as follows:—"In conjunction with the concrete surrounding sewer, where the latter is built upon arches and in embankments, the contractor to provide, fit, place in position, and wall in with the concrete, longitudinally, in each corner at top and bottom of concrete lining,  $\frac{3}{8}$ th inch diameter bond rods in 16 feet lengths, the ends to overlap 12 inches and tied together with binding wire, and, transversely,  $\frac{3}{8}$ th inch diameter bond rods  $4\frac{1}{2}$  inches above soffit of sewer of such lengths as to fit between the outer brick lining or as shall be directed, spaced 10 feet from centre to centre. The cost of providing, fitting, placing, and walling in, said bond rods to be included in the schedule price per cubic yard of concrete"? That clause was probably put in for safety's sake, with the view, possibly, of preventing the concrete from cracking.

13151. Do you think it would stop the cracking? It would have a tendency to prevent it from cracking.

13152. In the schedule signed by the contractor, you will find the following item, "Supplying and fixing hardwood round timber in piles, including the providing and fixing of iron shoes and other ironwork used in fixing same, as specified in clause 5, 7,400 lineal feet";—does that refer to the piling? Yes.

13153. Do you recollect why the piling was taken out? Mr. Hickson was dead against the piling. He said we had wasted a lot of money in piling in these works. I said "You had better allow us to put it in the specification, and then you can put it in where you like as you go on with the work. If you find

bad

bad ground you will have the specification there for the piling. Otherwise it will be an extra, and the contractors will be able to charge practically what they please." That being so, he permitted me to put in the clause.

13154. But it was not carried out? No; it was only to be carried out when ordered. It was left to Mr. Davis to report to Mr. Hickson. If he reported that piling was necessary, it would be done, and if he did not report that it was necessary, then it would not be done.

13155. You see that concrete is set down in the schedule as follows: "8,700 cubic yards of sandstone concrete, and 4,180 yards of bluestone concrete"; but the quantities actually were 10,190 yards of the former, and 3,416 yards of the latter? Yes; I see that the bluestone was diminished and the sandstone increased.

13156. But the increase was in greater proportion than the diminution? Yes.

13157. Why was that? That I cannot say.

13158. Would the sandstone be likely to be increased on account of the piling being done away with? That is very likely the case. They might have gone deeper with the foundations, and have put sandstone concrete in the bottom.

13159. What is the amount set down for piling? £1,480.

13160. So that there would not be a very great saving? No; it is better to be safe than sorry afterwards.

13161. In regard to the packing, you specified for concrete packing in certain cases, and afterwards the packing was changed to other material;—what was the object of specifying concrete for packing if other material would do? When sewerage works were started in Great Britain the work was constructed in a comparatively flimsy way. It was thought that, the sewers being out of sight, if they leaked a little it would not matter. In the streets of London there were various tunnels under the streets—some for water-piping and some for gas-piping, and so on—and it happened that when the men went down to repair the pipes and lighted a lantern, there was suddenly a terrific explosion. This was said to be due to defective tunnel work, and a great deal of mischief resulted. The repair necessitated the expenditure of a very large sum of money. The Americans built a large tunnel in rock under a lake, by means of which the waterworks at New York were to be supplied. That tunnel was similarly built—that is to say, there was a brick lining packed behind with sand. When the work was officially opened it was found that the water had gone into the sand packing, and that the whole tunnelling had collapsed. It cost several millions of dollars to rebuild the tunnelling in the proper way. It had been found out in England that slovenly-built tunnelling would not do for gas, water, or sewerage, and it was provided in consequence that the sewer should be bound to the sides of the rock, forming one watertight joint by means of concrete packing at the back. I remember that these accidents occurred in Mr. Bennett's time, and that he told me that we must be very careful in such matters. I do not remember at this moment the exact locality as far as the London work is concerned, but Mr. Bennett, I think, showed us the papers of the British Institute of Civil Engineers. There were also articles in the public press on the matter.

13162. About what date would that be? It would be about fourteen or fifteen years ago. It caused us to be very careful, and as a consequence we specified for concrete packing round the brick lining. When you build single-brick lining, it does not matter how careful you are, you will find that every joint will not be full of cement. For instance, in a small sewer, one bricklayer will be at work in front and the foreman will be seated behind him. The foreman will, perhaps, have half-a-dozen shafts to supervise. The brickwork lining is started from each shaft, and the foreman cannot be everywhere. The consequence is that if the bricklayer is not an honest man you will find numerous joints containing nothing at all, and if there is no concrete packing behind the brickwork you will find that the drainage over the sewer will form a water-way, and in course of time very serious trouble may arise. For instance, all our city sewers receive the sewerage from the old corporation sewers, and they are built very shakily in places—in fact, it was extremely difficult to intercept them. In a heavy storm, when those sewers were brimful, we received far more flood-water from them than our sewers were calculated to carry. Some of them, therefore, would be, under pressure, brimful; and, under those circumstances, if you had hundreds of joints without any mortar, and if you had no lining behind the brickwork, the sewer would collapse. It was found out upon one of the contracts that the contractor had left out the packing and had put in shale and other stuff in its place. Mr. Davis was a little annoyed about it, I daresay, and he made a handle of that incident to recommend to Mr. Hickson that the sandstone concrete packing behind the sewer lining was ridiculous. There was some correspondence on the subject, and I think the papers will show that the Minister was informed that sandstone concrete packing would not be introduced afterwards. I remonstrated with Mr. Hickson about this, and told him why we put it in. I told him that it had been put in on account of the terrible expenditure which had been necessitated in Great Britain and also in America from the absence of the packing, but he did not take any notice of my remonstrance. I remember writing a minute to Mr. Hickson about the matter, and he returned it to me without a single word upon it.

13163. *His Honor.*] I suppose you agree with Professor Warren that every joint is properly filled with cement mortar then the packing may be almost anything so long as it is substantial; but you want to provide for the risk, which you say is a very common one, of the bricklayer leaving some of the joints open? I do not agree with Professor Warren at all, and I never would. He was put into my office as a draftsman, and when the position of Professor at the University was advertised he asked me what I thought of it. I said, "By all means take it. I am afraid you will never be a civil engineer."

13164. *Mr. Parkes.*] Was he a calculator? That reminds me that we calculated the strength of the Bondi sewer at the point where it goes under the sandhills. Mr. Hammer, the chief draftsman, said to me "It will never do for one of us to do this work," and I agreed with him that we should all do it together, each in our own way, and then see what result we arrived at. I said to Professor Warren "You are a Dublin University man, you ought to be a good calculator." He said he was. Those who were making the calculation were Mr. Hammer, the chief draftsman, Professor Warren, Mr. Cardew, and myself. Mr. Cardew, I may mention, is a surveyor, and is a very good calculator. We all did this work together, and when we came to compare matters, Professor Warren was nowhere. He got stuck in the middle of the work. Mr. Hammer, Mr. Cardew, and I, came out very closely. I recollect that we calculated all the thicknesses of the sewer, and that one day afterwards Mr. M'Mordie came to me and said "Your sewer in the sandhills is gone." He asked me whether I did not remember that Mr. Bennett had in one instance reduced the thickness of the sewer considerably, and while we were speaking about that matter I was asked to go in and see Mr. Bennett. He said "Your Bondi sewer has gone." He told me the place, and

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and I asked him whether he would allow me to go to my desk for a minute. I told him that, when he had proposed the alteration, I had regarded the matter as a very serious one, and I remember asking him if he would take the responsibility of reducing the thickness. He had said that he certainly would. On going to my desk, I found the memorandum, from which it appeared that on a certain day, at such and such an hour, Mr. Bennett had come to me, and we had spoken about the different thicknesses of the Bondi sewer, that Mr. Bennett had said that at a certain point he would allow 2 feet instead of 3 feet, or whatever it may have been. Mr. Bennett roared with laughter when I pointed this out to him, and said "That is where you have me. You had better put the thing to rights again."

13165. The schedule and specifications for Contract 79 were made out by you? Yes.

13166. Let me draw your attention to your minute of 13th of March, 1894, in connection with Contract 79A, which appears upon page 325 of the Parliamentary Return. Do you recollect that minute? Yes.

13167. You say in that minute "By way of comparison I have prepared an office estimate of the cost of this extension according to present prices, amounting, as per detail statement attached, approximately to £12,831 19s. 6d.";—if you turn to page 337 you will see the schedule of Messrs. Carter, Gummow, & Co.'s prices for Contract 79, an extension from Mount-street to the junction of Campbell and Jeffry Streets, with branches—I want you to compare that with the office estimate upon page 339; having done that, will you tell me whether the office prices were made up by you? Yes.

13168. Do you recollect how you made up that schedule? As I said before, I always consulted with Mr. Davis to ascertain whether prices had dropped down before we settled upon the schedule. We put down, not what the contractors would probably tender at, but what we thought was the value of the work. Of course prices have dropped immensely since then.

13169. Did you do this particular work yourself? I could not be quite sure.

13170. Did you take into consideration the schedule of No. 79 when you made this particular schedule? I may have looked at it. In any case of the kind I am quite sure that I should have consulted Mr. Davis, and should have asked him whether there was any alteration in the prices. We would probably go through the prices together.

13171. But would the amount of money set down here fairly represent the difference between blasting and guttering and gadding? Yes; gadding is very nasty work.

13172. Why did you put in a certain amount of money for guttering and gadding if you knew that it was not going to be done? In travelling over the surface we would come to the conclusion that the people from such and such a point to such and such a point would naturally object to blasting altogether, and that if any mischief were done it would possibly cost a tremendous lot of money for compensation. Upon that supposition we would put down guttering and gadding at that point. In another locality we might come to the conclusion that if injury were done there by blasting, the compensation might also amount to a considerable sum of money; but still the sewer might be at a certain depth, and in that case we might allow so much blasting with 2-inch charges of powder. In another case we might allow blasting with 4-inch charges of powder. A distinct clause would be put in so that we could use either blasting or guttering and gadding, as necessity arose. You must always in a contract like this put down a certain quantity.

13173. If you look at Contract 79, you will see that all the guttering and gadding work there was done away with in favour of blasting? That was very likely.

13174. Why was not the guttering and gadding work carried out? We always make provision for it, and if afterwards no one complained of the blasting, the work would be done by blasting. Of course, the work would be done as cheaply as possible.

13175. Ultimately, in the case of both 79 and 79A, blasting was used? That is very likely the case. Probably, if persons did not threaten us with lawsuits and so on, in that case blasting would be proceeded with. The contractors do not like guttering and gadding; it creates too much dust down below, and we have heard of a good many cases where men have died from consumption contracted while doing guttering and gadding work.

13176. *His Honor.*] Do you think that guttering and gadding is very much worse for the men than blasting? Yes.

13177. Where there is fair ventilation? Yes; it is always worse, because, it being done chiefly in small sewers, you have one man seated at the end of the work, and with the very best of ventilation, he must inhale the fine stuff from the gadding. All kinds of things have been tried, but it has been found that a certain number of men have died from the gadding when it has been carried out.

13178. *Mr. Parkes.*] This specification seems to be general; there are clauses in it which are never carried out; there are clauses in it for instance having reference to interpretation of terms, supplementary specification, and all sorts of things which are not carried out;—why not have a complete and definite specification for each work? That is what I have always advocated. I have been writing specifications since the year 1844. In Victoria we took the Crown Solicitor's opinion upon this matter, and he was of opinion that the specification for each contract simply described the work comprised in that contract—neither more nor less. Mr. Hickson, however, was very anxious to introduce novelties, and he said to me "Your specifications are far too long." Possibly they were long, but there was a rule in Victoria that if a man forgot anything, in the specification for a big job, which ought to have been contained in it, he was fined from £5 to £20. I have drawn specifications in Victoria for big jobs—graving docks, lunatic asylums, hospitals, fortifications, and numerous other works. I told Mr. Hickson that I had never been fined for any omission, and he said he could quite believe it. I was careful that my specifications contained everything which was necessary. However, Mr. Hickson said the specification should be shorter, and he asked me why I did not generalise. I asked Mr. Hickson how it was possible to do that when there were so many different descriptions of work to be done. I said it would make a book. All the different Departments, I believe, were requested to do the same thing, but they all protested. They did not like the idea. Mr. Hickson, however, was very peremptory. He once sent a specification back to me with a few words upon it to the effect that what he wanted must be done at once. I was very much puzzled as to how I could carry out what he wanted, but I finally completed the work and Mr. Hickson seemed satisfied with it. I believe the specification I drew has since been used in all the different Departments. After a time it was still thought too long, and Mr. Davis and others were asked to curtail it. I believe they did so, but it did not contain what, in my opinion, it ought to have contained.

13179. Is the form printed in the Parliamentary papers the curtailed form? Yes, I think so.

13180. How much greater was the original specification which you say made a book? It would be several pages bigger than the specification you have there.

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13181. Was there any reference to supplementary clauses and things of that kind? There may have been. It is quite possible that things may have been omitted. As I say, I do not like that form.
13182. You prefer a specification for every individual job? I do. It would not take us a very long time to prepare it, because if a work similar to the one already carried out were proposed the clauses in reference to it would be cut out of the preceding specification. It would not take very long to prepare the specification, although it might have cost a little more in printing.
13183. You think there should be a distinct specification for every work? Yes. It is impossible, in a general specification, to specify everything. If, for instance, you are constructing a sewer, you will find it necessary, in many cases, to add another specification.
13184. *Mr. Davis.*] How long did it take you to make the schedule to the specification which you say was so voluminous? A good deal of time. I had other work to do.
13185. How many months did it take you? It may have taken me three months for aught I know.
13186. The clause read by Mr. Parkes in reference to the bonding rods in Contract 101 was a general clause which would come in where it was considered that it would apply? I could not say. If it is in the specification, it may be a general clause.
13187. Do you know the practice in Victoria at the present time as to the system of tendering? I think there is in Victoria, from what I have seen, a schedule of prices.
13188. That is to say the contractors fix their prices? I could not tell you that.
13189. Was it before or after the receipt of the tenders for Contract 79 that you saw Mr. Hickson with regard to the big rates for shaft excavation? It was after receipt of tenders.
13190. With regard to Contract 69;—was it before or after the receipt of tenders that you saw Mr. Hickson with regard to the price of £50 per square yard for bluestone pitchers? If I saw Mr. Hickson it would always occur when the tenders were sent up to me. The tenders would come up to me from the Board. I then looked through them and recommended the acceptance of a certain tender. If I saw any incongruity in connection with a tender, I would direct Mr. Hickson's attention to it.
13191. Are you sure that you went to Mr. Hickson and pointed out to him this price of £50 for bluestone pitchers? Yes.
13192. You are sure of that? Yes.
13193. Why did you not put it in your recommendation? For the simple reason that Mr. Hickson told me that it was of no use objecting, and that we should have to pay the price given. He insisted upon the price in the schedule being paid. I suggested that the tenders should be sent back to Carter, Gummow, & Co., and that they should be asked to revise their prices, but he said that that could not be done.
13194. Do you not recollect that that matter arose in connection with the first certificate that was made out? Not at all; it arose immediately the tenders were sent to me for my recommendation.
13195. You will see from page 66 of the Parliamentary return that you sent in the eleven tenders, and recommended the acceptance of Carter, Gummow, & Co.'s tender of £45,207, and that in recommending the acceptance of that tender you pointed out certain slight irregularities? Yes, that may be.
13196. Was it not your custom to include in your recommendation anything which you had to say as to the tender which you recommended? Not at all.
13197. Why did you do it in that case? I forgot for the moment that a question had arisen in connection with the ironwork; but I remember that I consulted Mr. Hickson about the £50 per square yard for bluestone pitchers. I remember that when the tenders came up I called you in to see me about the matter, and I went down straight to Mr. Hickson with the tender. I told him that a price of £50 per square yard for bluestone pitchers had been sent in, and asked him what we were to do with it. He said, "It cannot be helped; we shall have to pay it."
13198. You are quite clear in your mind that you saw Mr. Hickson before you recommended the acceptance of the tender? Yes. I put in my minute that which I thought Mr. Hickson would be prepared to accept.
13199. Supposing other officers of the Department are prepared to swear that this matter was not detected until the first certificate came to be made out, will you still persist in saying what you do? The officers of the Department are at the present time labouring under a reign of terror, and I would not believe a single man in it.
13200. And upon that ground you stick to what you said? I do, most decidedly. I could have had many witnesses here if I had not thought that the unfortunate fellows might lose their positions.
13201. Have you tried to get them here? No; they offered themselves to me, but I declined the offer.
13202. Did they say they would not come because they were afraid of losing their positions? No; I said to them, "I could have obtained summonses for you, but I will not do such a thing, because if you love your bread and butter you would not state the truth."
13203. Will you give us the names of those officers? No, I will not.
13204. *His Honor.*] What is the reign of terror you speak of—does it arise from the operations of the Public Service Board? The position of matters is this. A Public Service Board has been appointed, and the only professional man upon the Board is Mr. Coghlan. We all knew in the Public Works Department that Mr. Barling was practically Engineer-in-Chief. We all knew it, because whenever Mr. Hickson told me of any change, he said, "Mr. Barling wants to do so-and-so." I should explain that Mr. Barling was originally chief clerk of the Harbours and Rivers Branch, and I say that it is a slap in the face of every professional man in the Service that they should be ruled by a gentleman who understands nothing about professional matters. Mr. Barling made a number of professional appointments, and I say it is a slap in the face to every professional man in the Service that he should be under his rule.
13205. What I wish you to explain is what you meant when you spoke of a reign of terror—did you refer to the action of the present Public Service Board or to the action of any other authority? I am dealing with things as they are at this moment. The Public Service Board has removed such a number of public officers as to practically bring about another Black Wednesday. In the Victorian case the Black Wednesday was the cause of about a dozen suicides among the Civil servants. Here so far it has caused only one. What I mean to say is this—that if you go through the Public Works Department at this moment you will not find a single man in it who has a happy feeling with regard to his position; they are terror-stricken. They do not know at what moment they may be turned out of doors.
13206. Then, in alluding to a reign of terror, you do not allude to the present heads of the Department but to the Public Service Board itself? I do not believe there is a head of a Department at this moment who does not shake in his shoes quite as much as do other officers in the service. 13207.

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13207. *Mr. Davis.*] You mentioned that you were terribly afraid that Mr. Stayton was about to supplant you, and you went so far as to state that Mr. Barling intended to appoint Mr. Stayton in your stead—is that the case? I was not exactly afraid of Mr. Barling doing it, but I knew that he wanted to do it from the beginning. As far as I myself was concerned, at that time I could have got a better living outside. Even at the present time I can make a living outside where other people would starve.

13208. Have you any special grounds for making the assertion that it was proposed to put Mr. Stayton in your place? Mr. Stayton came to the office at the time to which I refer. I may mention that it was then considered a novelty to take into the work of the Department as many strangers as possible. Mr. Stayton was appointed by Mr. Bennett to make a report upon the western suburbs sewerage, and he came to me and asked me for all kinds of information about it. I said "How is it that you come here. You are supposed to have all the latest ideas at your fingers' ends. Why should you come to me for all this information?" He said "I am not such a fool as not to know that you fellows are doing the work, and that you have it at your fingers' ends, whereas I have not. How can I introduce anything which is new? I cannot show you anything which is new." Mr. Stayton is a good speaker, and he is a clever man in many senses of the term. He wrote a report and got my best men to help him to do so. I repeat that Mr. Barling, from all I know, intended to have Mr. Stayton in my position.

13209. Is not that a mere surmise on your part? I do not think so. At that time there was a Parliamentary party who went down to examine the sewage farm. At that party it was stated that Mr. Stayton ought to have charge of the work. Mr. Bennett said: "No; I am not aware that Mr. Stayton has carried out any work; but I know what Mr. Bagge has done in my own office. As long as I am alive Mr. Stayton shall not supplant Mr. Bagge." That is where my surmise comes in.

13210. But Mr. Barling had no connection with that? Mr. Hickson came to me and said "You know Mr. Barling says it is absurd to have you alone in charge of this work. All the responsibility rests upon you. There should be at least three Bagges." I consider that for a man like Mr. Barling, who was the chief clerk of another Department, to say that I was not competent to carry out this work, and to have the responsibility of it, was going rather too far, seeing that I carried out very extensive works. I consider that that matter alone affords quite sufficient ground for me to grumble about Mr. Barling's interference.

13211. Going back to the arches to which you have referred, will you tell His Honor where this branch sewer was at Rose Bay? I thought it was Rose Bay, but I have come to the conclusion that I must have been mistaken. You yourselves must know perfectly well where it is, and if you think I am wrong tell His Honor where you think the arches were which we saw. You drove me out to the sewer, and you know perfectly well where it is.

13212. *His Honor.*] Do you think you could point out the spot now;—there seems to be some doubt in your mind as to whether it was at Rose Bay or not? Yes; I have not the slightest doubt that I could point it out. I know I was living at Darling Point at the time, and that the work was out in that direction.

13213. *Mr. Davis.*] Was it part of the main sewer which comes above ground? No; it was a branch sewer going into the main Bondi sewer.

13214. A branch sewer in what district? I could not remember at this moment, unless I went over the ground and saw the sewer.

13215. On which side of the main sewer did it come in—was it on the northern side? I think so. If I went out to the place I could find it; I have not a shadow of a doubt of that.

13216. You think it was not at Double Bay? No, I think it was at Rose Bay.

13217. *Mr. Carter.*] Referring to the question of defective work of which you were talking just now, and which you presume is in Rose Bay—was it not, as a matter of fact, upon Double Bay, upon our contract going through the Chinese gardens;—do you not remember coming out and looking at some of that work? I recollect Mr. Davis coming to me in the office one day and telling me about the work to which I refer.

13218. *His Honor.*] In going to it did you drive down the new South Head Road? Yes.

13219. *Mr. Carter.*] Do you not remember that the work to which you refer is in the Chinese gardens upon the Waverley contract, and do you not remember that the cause of it was a faulty design on the part of the Department—there being insufficient foundations in bad ground;—do you not remember that the design was altered, and that they paid us for the foundations? I do not remember that. I remember that there was a great quantity of sand in the work that I saw, and I remember telling Mr. Davis that the centering had not been watertight.

13220. Referring to Contract 79 at North Shore, and the items for guttering and gadding, did you ever contemplate guttering and gadding at the depth at which that contract was carried out—250 from the surface? It was not all that depth.

13221. But a good deal of it was, was it not? The guttering and gadding was supposed to be done in the neighbourhood of shafts. When a shaft has been sunk, and when they begin blasting, there is a terrible concussion, which has been felt on the surface to such an extent that in some cases it has been known to blow out the fanlights of houses. We always allowed a certain amount for guttering and gadding.

13222. But you never contemplated that the whole contract should be carried out by guttering and gadding—say, 1½ mile? No; only a small quantity was given.

13223. So that if Mr. Davis tried to make us carry out all the work by guttering and gadding he was exceeding his power under the specification? It was not intended that the whole work was to be carried out by guttering and gadding. That is why I fixed a certain quantity. Supposing we had put down 360 cubic yards, and 1,000 yards were suggested, I would consider that it would be wrong to make the contractors do that quantity. That is why we fixed the quantity as nearly as we possibly could.

13224. Referring to financial matters, how did you arrive at the conclusion that the prices in connection with Contract 79 were fixed at a very high rate for the first few items for financial reasons? I am an old practical man in these matters, and I have dealt all my life with contractors, and when I saw this extraordinary rigging the only conclusion at which I could arrive is that which I have stated. I knew that money was tight at the time; I had heard so from outsiders; and I said to Mr. Hickson that the only reason for these prices was that the contractors wanted to raise money out of the items with which to carry on the work.

13225. Were you told that money was tight with us, as far as we were concerned, or that it was tight generally? Tight generally.

13226. You have no knowledge of our financial affairs? No.

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13227. *Mr. Davis.*] How long is it since you were retired? I think it is very near a year ago.
13228. You had a difficulty in getting the question of compensation settled, had you not? Yes.
13229. In fact, it has been settled only within the last few months—is not that so? I received it a day or two over the three months after the 31st of January.
13230. In the meantime you bought a house at Minto? Yes.
13231. And you found that in order to carry out your ideas you had to make certain alterations to that house? Yes.
13232. Did you find any difficulty in carrying them out? Certainly. I will tell you how the matter stood. I met Mr. Snodgrass one day; he stuck me up in the street, and he said "I hear you are going to build out there. You take my advice and come to us for your building material. We will let you have it at the same price we give ourselves—that is wholesale. If you get it for yourself you will be taken in nicely." I said "I will think over it." Mr. Snodgrass then added "There is no obligation at all in the matter. You will get the material at the same price at which we get it ourselves." I said "What I should like is a good carpenter. The tenders I have got in are such extraordinary ones that I am afraid to tackle the work." He said "I will recommend you a tip-top carpenter. He has built houses for us, and so on." I said "All right." He sent me this carpenter. He was a smart fellow. I took him out there and he engaged other carpenters. The building was constructed of the material which I obtained from Carter, Gummow, & Co. at their prices. The prices were very moderate indeed—in fact, the people in the neighbourhood said that I should not be able to buy the material myself at the same prices. Afterwards, when I was building again, I went to Mr. Gummow, and he said "You will find that you have the material at the price which we paid for it. I had got into a fix because Mr. Barling did not pay me my money when it was due, and I had speculated with every penny of it. However, he kept me waiting, and I could not stand hat in hand in front of the offices of the Department waiting until it pleased Mr. Barling to pay me the money. I was not earning anything, and I had to lay out my money to make an existence for myself and family, and that I have done."
13233. But you got the material you required from Carter, Gummow, & Co.? Yes.
13234. Did they not in addition to that lend you money? When Carter, Gummow, & Co. gave me the material I said to them "You must wait until I get my money from the Government; if I get it on the 31st January I will pay you for the material on that date."
13235. But did they not lend you money? I worked on as far as I could; I had borrowed on my insurance policy, and I was stuck up. I had about another fortnight's work to do, and I said to the carpenter "You will have to clear out." He said "I am sure Carter, Gummow, & Co. will advance you £20." I said "I do not like to ask them for it." He said he would see them about it, and he did so. I gave Carter, Gummow, & Co. a promissory note for the £20 and for an amount sufficient to cover the cost of the material. The moment I got my money from the Government I went to Carter, Gummow, & Co., and paid them every shilling I had owed them.
13236. What did you repay to Carter, Gummow, & Co.? I paid them £150 for material and £20 for their loan—in all £170.
13237. What was the date when you made arrangements with them to get the material and money, amounting in all to £170? I could not tell you the exact date. I remember meeting Mr. Snodgrass once by accident, and he asked me what I was doing. I told him, and I said I had a great mind to do the work by day work. I remember his saying that it did not matter about the money, as they would let me have the timber and get the money when I got it from the Government.
13238. Did they charge you any interest? Not a 6d.
13239. Were they not, for some reason or other, very liberal and obliging. Yes. I believe they were actuated by no other feeling than this—that I had been in the Government service for a number of years, and that the least they could do for me would be to let me have the material at wholesale price. They deal in those things wholesale, and it was next to nothing out of their pockets; besides, when times are bad, they are a firm who like to keep things going, as it were.
13240. They did not expect to get any advantage from you by accommodating you? No; they never asked for it.
13241. *Mr. Parkes.*] When you bought this material, and got this carpenter from Carter, Gummow, & Co., had you left the Service? Yes.
13242. Did you ever have any financial transactions with them while you were in the Service? No.
13243. If their bank-book shows a cheque under date of April 2nd for £170, that would probably be for the payment of the money you owed them? Yes.
13244. How long was it before that date that you made arrangements with them for the carpenter and for the timber? It would be about four or five months before that date.
13245. It was only a business transaction after all;—you paid for what you had? Yes.
13246. During the time you were in the office no approaches of any sort were made to you? No.
13247. The firm had no favours to buy from you? No.
13248. And they would not be likely to pay you anything for calling attention to their rigged schedule? No; I should say that in no case did I speak a bad word, or anything of that kind of anyone, if I could possibly help it.
13249. *Mr. Carter.*] Mr. Parkes has put the transaction between us in the light of a business transaction—as a matter of fact, was it a friendly transaction or a business transaction? In one sense of the word it was a business transaction. When Mr. Snodgrass offered me a good carpenter, and offered me the materials at cost price, it was a friendly transaction.
13250. Did we not lend you our best carpenter;—were you not thoroughly satisfied with him? I was not. He spent about £50 more than he ought to have spent.
13251. Did we not guarantee your account at the timber merchants—you must remember that we do not deal in timber? That I do not know.
13252. Do we sell timber? No; but Mr. Snodgrass said "Get your material through us. You will get it cheaper than if you were to buy it yourself."
13253. *His Honor.*] As regards the packing of the lining of the sewer, in saying that it is very important that it should of itself be of watertight material, I understand you to say that that is principally, if not entirely, because of the chance of a joint here and there being left open in the brickwork? Yes.
13254. And it is, unfortunately, a peculiar weakness of the Australian bricklayer to leave joints open when he can? We calculate upon the brickwork being watertight, but, unfortunately, it is not always so.
- It



C. H.  
Ohlfsen-  
Bagge.  
17 Aug., 1896.

It is almost impossible to rely upon there being watertight joints in the brickwork, and the packing, of course, would cover any loose joint.

13255. If you were quite sure that every joint was actually full, then, as a general rule, any solid packing, whether watertight or not, would be sufficient? You must look at the matter in this light. If the sewer were built outside it would be surrounded by concrete, in order that it might hold itself up, and the moment the solid packing is taken away from the sewer you simply leave the  $4\frac{1}{2}$ -inch brickwork, and that is not sufficient.

13256. But any substantial packing that fills up the interspace between the outside of the lining and the tunnel walls would generally be sufficient if every joint of the brickwork were really full, would it not? No; it would not. The packing should be concrete.

13257. You think it is better that it should be concrete? Yes; of course, when I speak of open joints, it must be understood that even with the best supervision loose joints will creep in, and I think the  $4\frac{1}{2}$ -inch brickwork ought to be packed watertight up to the rock in which it is built.

13258. Even if the brickwork is absolutely watertight throughout? Yes. I generally calculate that single-ring brickwork will be watertight for from five to six years. I would never trust it of itself.

13259. Does the brick change its character then? No; but you must not forget that the mortar is not always of the consistency at which it leaves the mortar-box when it goes in between the bricks. Little faults will creep in here and there, and sometimes a joint is dry. Sometimes also the mortar is weaker in one place than in another. Take the case of stoneware pipes, the joints of which are filled with 1-to-1 cement. You can test the joint up to 50 lb. of pressure if good cement is used, but in the case of the mortar which is put into these tunnels you must remember that it is handled at the top and shifted about at the bottom. You cannot always rely upon its being of the proper consistency. Then, again, in these tunnels you have to consider the waterwear from outside drainage. That may become a very dangerous thing.

13260. Suppose the sewer is built in a tunnel of solid rock? Even in a solid rock it should be packed watertight, because you never know where a fissure may end, and it is a well-known fact that if you sink a shaft in solid rock, in the course of time, if there is any water-bearing fissure in the neighbourhood, it sucks and sucks the water in. Once water gets through it increases the cavity, and in course of time you might get serious waterwear round your sewers. Theoretically, packing may be deemed unnecessary here and there, but it is not so in practice. They found that out in Great Britain very much to their cost.

13261. *Mr. Parkes.*] Are there used in this country any porous bricks? Plenty. Ordinary building bricks will soak up from three to four times as much water as sewerage bricks.

13262. Will plastic double-pressed bricks keep water out? I cannot say, speaking from memory, what quantity of water they will soak up, but they all soak up some water. Of course, the finer the brick the less water it will soak up.

13263. Double-pressed bricks will not keep water out of a house? They ought to if the bricks are good.

Thomas Williams recalled and further examined:—

T. Williams.  
17 Aug., 1896.

13264. *Mr. Parkes.*] I want you first of all to explain the exact nature of your contract with the Water and Sewerage Board in connection with which you obtained some advantage;—in the first place, were there any bores put down? No; none whatever.

13265. Did the plan indicate the material through which you had to drive? No.

13266. Did any officer of the Department object to paying you your claim? No; but when the work had progressed to a certain extent, and when money had been expended up to the amount of my tender, they wanted to stop the contract.

13267. How many contracts have you carried out for the Water and Sewerage Board? About five or six.

13268. And this is the only case where you had an advantage? That is the only case.

13269. You had a dispute in this matter with the officers, had you not? No; except that they wanted to stop the work and not go on with some portions of it.

13270. There was an appeal to the Water and Sewerage Board? Yes.

13271. And was Mr. Hickson the strongest man at the Board for paying you your claim? I was told he was, but this is the letter I received:—"Sir—In reply to your letter of 7th instant, requesting that the necessary information might be furnished you in order to carry out the schedule of work enumerated therein in connection with your Contract 78, the construction of pipe-sewers in portion of the Borough of Glebe, I am directed to inform you that the Board of Water Supply and Sewerage have approved of your contract being carried out to the extent shown on the plan." I am told that Mr. Hickson proposed that I should be allowed to do that.

13272. Therefore, you have no ill-feeling towards Mr. Hickson? Certainly not. It would be rather the other way about.

13273. He has been your friend to the extent you name? Yes.

13274. With reference to your conversation which you are supposed to have had with Mr. Millner, where did you meet him? In King-street.

13275. What was the conversation? I do not remember it very well, but I think I gave it you as nearly as I can remember it when I was here on a former occasion.

13276. As a matter of fact, was it not Mr. Millner who gave you a lot of particulars about Government contracts which you gave to me? He was the first man who told me of the cutting of the storm-water drain at Johnstone's Creek by the unemployed. He used to pass my house nearly every time he went across in that direction, and he told me once that the unemployed were cutting a drain for Carter, Gummow, & Co. He told me that Mr. Davis was actually against the work being done by the unemployed, but that Mr. Hickson passed it.

13277. He said that Mr. Davis opposed it, and that Mr. Hickson passed it? Yes.

13278. Was Mr. Millner also the gentleman who gave you most reliable information—information which you most relied upon—as to the action of the Department with regard to Carter, Gummow, & Co.'s extensively-rigged schedule? Yes; he told me about that affair. He told me, also, with regard to Carter, Gummow, & Co.'s contract, that Mr. Davis condemned the use of the sandstone taken from the district in connection with the contract, but that Mr. Hickson also passed that.

13279. The conversation among the lot of you was one of general condemnation? Yes; Mr. Millner said he would not take the responsibility of doing it.



13280. How many more were present besides your two selves? When he spoke to me about the storm-water sewer there were only our two selves present, but Mr. Millner approached me last Saturday in Moore-street, and wanted to apologise for what he had previously told Mr. Davis. T. Williams.  
17 Aug., 1896.
13281. He came to see you last Saturday, you say? Yes.
13282. Did you, prior to the letting of Contract 77, or after the letting of that contract, have an interview with Mr. Gummow? Yes; it was after the work was started.
13283. What conversation took place;—did Mr. Gummow say anything to you as to the way in which he had arranged the schedule for the Monier work? No.
13284. You are sure of that? Yes; I do not remember anything about that.
13285. You do not remember any conversation with him about that? No; and that is the only conversation I have had with him for three or four years.
13286. Did Mr. Gummow at any time give you information as to how the lump sum of £15,500 was arrived at in connection with the Monier arches? No.
13287. *Mr. Davis.*] You have seen Mr. Millner pretty frequently then? Yes; he came across to where I was standing in Moore-street on Saturday, but that is the only time I saw him since the conversation in King-street, about which you asked me the other day.
13288. The conversation in King-street took place about how long ago? About two months ago.
13289. Did you see Mr. Millner on any other occasion at about that time? I do not recollect it just now.
13290. Did you see him pretty frequently at one time? Yes, while he was supervising the work at Johnstone's Creek. He then used to pass my house about three or four times a week.
13291. You say that you received information from him which you imparted to Mr. Parkes? He was the first man who told me anything about the cutting of the storm-water sewer by the unemployed at Johnstone's Creek.
13292. What did he tell you? He told me that the unemployed were cutting the drain, and that it was a great saving to the contractors.
13293. Did he say anything else about it? Well, after Mr. Parkes had brought the matter up in the House, by asking a question of the Minister, and after the Minister had replied that the work would cost about £70, Mr. Millner told me that it would cost nearer £400.
13294. When did he tell you that? A day or two after the Minister's reply to Mr. Parkes.
13295. Did he give you any other information which you handed to Mr. Parkes? No.
13296. Did he give you any other information which you did not hand to Mr. Parkes? I do not remember any just now. If you can mention any I may remember it.
13297. Was there anyone present at the interview which took place between yourself and Mr. Millner in King-street? Yes; I told you before that Mr. Wright, Mr. Ewing, and Mr. Madison were there. They four were standing together, when I came up. We were alone when Mr. Millner spoke to me about the cutting of the drain at Johnstone's Creek.
13298. When you made the remark respecting Mr. Hickson and myself, you say that Mr. Wright, Mr. Ewing, and Mr. Madison were also present? Yes.
13299. You know several of the officers in the Sewerage Branch, do you not? Only just through meeting them.
13300. Will you tell us those with whom you are most intimate? I am not intimate with any of them.
13301. You do not know any of them intimately? No, I only know them through meeting them casually.
13302. Did any other officer of the Department besides Mr. Millner give you information which assisted you in coming to the conclusion at which you arrived? I do not think so. I have heard men talking about different things, but when you say officers, I presume you mean engineers.
13303. I mean engineers or superintendents? Of course, I have heard your inspectors say a good bit. For instance, ex-Inspector Brown said he went to see you, and that you shook hands with him, and he was very much surprised at your doing so.
13304. Have you heard anything from any other inspectors besides ex-Inspector Brown? No; I do not recollect anything now.
13305. Do you know any of the engineers besides Mr. Millner? Yes; I have met them at various times—Mr. Smith and Mr. Rudolph, for instance.
13306. Do you know Mr. Smith? Yes, through meeting him.
13307. Do you know Mr. Rudolph also? Yes, I have just met him.
13308. Did Mr. Rudolph give you any information? No.
13309. Did Mr. Smith give you any? No.
13310. No information at all? No.
13311. You swear that? Yes.
13312. You had a talk about this Commission to him, did you not? It came up two or three times, but I do not think it was referred to particularly. I remember at one time talking to Mr. Smith about the Commission. I remember saying that if it had not been for the Monier business, and one or two things like that, the thing would never have cropped up.
13313. That is what you said, but what did he say to you? I do not remember his answer.
13314. He is not like ex-Inspector Brown? I do not think he said anything in particular.
13315. Would you tell us what occurred on Saturday in Moore-street? Nothing in particular occurred, except that Mr. Millner said that he was very sorry that he told you what you asked me about.
13316. What was it he said he was sorry for? To think that he should have repeated a conversation. He said that, I think, in the presence of Mr. Ewing, Mr. Madison, and Mr. Wright. The same party happened to be together again, and Mr. Millner said that from that time forth his mouth would be closed.
13317. *Mr. Parkes.*] You did not tell Mr. Millner that you contractors wanted to get Mr. Hickson and Mr. Davis out of the office? No.
13318. Would you have any object in such a course? No.
13319. As long as you have a fair chance of tendering that is all you want? All we want is a fair go.
13320. *Mr. Carter.*] Referring to the conversation which you say you had with Mr. Gummow, you say you had only one conversation with him in three or four years? Yes, as regards the works.
13321. I do not like to throw any doubt upon your statement, or to infer in any way that it cannot be true, but I suppose you are quite sure about it? Yes; I met Mr. Marr at the time at Johnstone's Creek, and he was going down to the crusher for a firebar.

- T. Williams. 13322. And you say that the only time that Mr. Gummow spoke to you in three or four years he spoke to you about his business secrets? There was not much business secrets at all, but the thing cropped up in connection about what Mr. M'Sweeney might say.
- 17 Aug., 1896. 13323. *Mr. Parkes.*] You did not quite understand my question, I think, in reference to the conversation you had with Mr. Gummow—was it after Contract 77 was let or before it? I think I have made a mistake in the name. I think it was with Mr. Snodgrass that I had a conversation. That was before the job was let.
13324. Your conversation, you say, was with Mr. Snodgrass? Yes.
13325. What was the conversation? He told me that he and Mr. Carter saw the schedule of quantities before they were printed in connection with jobs, and that they had them fixed up to suit themselves.
13326. Where was he when he told you that? He told me that one day in the tram after Contract 69 was let. That is the contract I am referring to particularly now. I think it would be about May two years ago. It was on the day when Mr. Carter, Mr. Snodgrass, and Mr. Davis had had an interview with Mr. Hickson about the bluestone pitchers.
13327. And what do you say Mr. Snodgrass said? He told me that they always saw the schedule of quantities before they were printed.
13328. Was there any conversation about Contract 77 at that time? No.
13329. Not about the Monier work? No.
13330. That was not specially referred to? No.
13331. *Mr. Davis.*] Are you sure Mr. Snodgrass was not chaffing? He might have been; he was often given that way.
13332. Was he sober? I think so. He had been with you that morning, and you would be the best judge of that.
13333. *Mr. Norrie.*] Did you believe him? I did not take much notice of what he said.
13334. *Mr. Carter.*] Mr. Snodgrass was very much given to chaffing? Very much.
13335. *His Honor.*] Is he a thirsty man? I do not think so.
13336. Is he a man who likes his whiskey? I think he knows enough to look after his business first. Whiskey might come in afterwards.
13337. *Mr. Parkes.*] He is one of the shrewdest men in the firm, is he not? He has the name for it.

John Moore Smail recalled and further examined:—

J. M. Smail. 13338. *Mr. Parkes.*] You produce a copy of the papers placed before the Water and Sewerage Board relating to the change in the system of tendering? Yes. I was requested to produce some papers relating to that matter when I was last here, and the papers which I will now read are copies of those papers:—

17 Aug., 1896.

Copy of Records, No. 94-43 (Sewerage), of 10/1/94.

Metropolitan Board of Water Supply and Sewerage, Sydney, 13 December, 1893.

COMPULSORY DRAINAGE—HOUSE CONNECTIONS.

I HAVE the honor to submit herewith a revised specification and schedule for the drainage of houses under the compulsory powers of the Act.

I would suggest that, in calling for tenders for such work in the future, a yearly contract should be entered into on the basis of a percentage above or below schedule rates, such rates to be fixed by the Board, as being more workable, and saving time in cases where it is a matter of urgency to proceed with the work.

Under the present system, where works exceed a certain amount, tenders have to be called, and delays ensue which would not take place if they were carried out in the manner suggested.

HENRY E. RIGGS.

Engineer.

Make alterations as directed, and resubmit on Friday.—J.M.S., 18/12/93. Mr. Riggs. Alterations made as directed.—H.E.R., 21/12/93. Engineer. Forwarded.—T.G., 21/12/93.

In view of legislation *re* recovery of costs of work carried out under the compulsory clauses of the Act, I recommend that an annual contract at schedule rates be let for the whole area under the jurisdiction of the Board. This course will simplify the work under this head, and economise clerical work. Before any district is operated upon, a list of properties, upon which notices have been served and not complied with by the owners, will be submitted to the Board for approval to carry out work. On Board approving, instructions, accompanied by plans, will be issued to contractor to proceed with work, the work will be inspected and measured up by the officer-in-charge of house drainage, and owners charged for same at schedule rates. The previous system was to call for tenders for a number of houses, but as soon as some owners found out that the Board intended carrying out the drainage of their properties they asked to be allowed to do it themselves. This was agreed to, and in nearly every case where plans were withdrawn the owners fulfilled their pledges. The withdrawal of plans from contract caused some trouble and complication, and to obviate same in the future a yearly contract at schedule rates is proposed.—J.M.S., 27/12/93. Secretary. Submitted to the Board.—28/12/93.

Deferred until next meeting, in the meantime Messrs. Hickson and Lander promised to look into the matter.—R.B., 28/12/93. Submitted to the Board, 6/1/94. Deferred. Submitted to the Board, 9/1/94. The report of the Engineer was adopted.—R.B., 10/1/94. Sewerage Engineer. Have specification printed and instructions shown in my minute to be carried out.—J.M.S., 10/1/94. Assistant Engineer. Noted.—T.G., 11/1/94. Mr. Riggs. Noted.—H.E.R., 11/1/94. Requisition for fifty copies of specification, &c., as per draft herewith.—T.G., 11/1/94. Clerk. Requisition made out.—J.R.M., 13/1/94. Have the copies of specification been printed?—T.G., 1/2/94. Clerk. The Act will shortly become law. I wish this matter pushed on.—J.M.S., 2/2/94. Assistant Engineer. The specifications are all ready and drawings.—T.G., 3/2/94. Engineer. Have list prepared for submittal to Board of properties to be dealt with, separating them into boroughs.—J.M.S., 7/2/94. Assistant Engineer. Mr. Riggs.—T.G., 8/2/94.

Sir,

56, Broughton-street, Glebe, 7 May, 1894.  
*Re* Contract 78, Glebe Sewerage, I have the honor to request that the levels, depths, and lines, of the sewers enumerated in the Schedule herewith, and forming part of my Contract No. 78, may be ascertained and set out, and the necessary data given to me in order that I may proceed with the works forthwith.

I have requested your Engineer to furnish the above information, but he refuses to do so, and states that he purposes calling for fresh tenders for the remainder of my contract.

Such being the case, I am compelled to apply direct to your Board.

To the President of the Board of Water Works and Sewerage.

I have, &c.,

THOS. WILLIAMS.

SCHEDULE OF SEWERS.

Parramatta Road; Old Parramatta Road; St. John's Road; Upper Road; Cross, Ross, Foss, Davis, Junction, Charles, Hereford, Alfred, Arthur, and Albert, Streets; Wigram-lane; Lines 17, 18, 19, 20, 21, 22, 23, 24, 25, 25A, 25B, 26 (part), 26B, A, AB, 35, 37, 38, 40.—T. W. The

The accompanying tracing shews the position of sewers enumerated in above schedule. Owing to the manner in which schedule of rates has been fixed the amount voted for the contract is not sufficient to complete the works. Area tinted pink in tracing being the portion for which an additional authority will be required, in this area, lines underlined in red in above schedule of sewers occur, and cannot therefore be set out; in reference to the other lines enumerated above, they have been allowed to stand over at the request of the contractor, but will now be set out without delay. It might be pointed out that the contractor tendered, according to schedule rates, to do the works at £2,376 per mile; this includes tunnelling and rock excavation; the works actually executed have cost £3,168 per mile; those portions not yet set out will cost about £2,428 per mile, whilst the portion tinted pink, in which there is neither rock tunnelling nor other expensive work, will cost £3,326 per mile; at fair rates this could be executed for half that amount or (say) £1,700 per mile.—T. G., 12/5/94. Engineer.

Contract Nos. 78 and 86, Glebe Sewerage.

Mr. Williams' reasons for my not giving lines on his Contract No. 78 are not correct. At his interview with me he was informed that some of the lines at western portion of his contract, shewn by pink tint on tracing, were to be proceeded with as I did not intend he should pick all the plums out of the contract. He was under the impression that his contract was to be considerably reduced; on this point I informed him that at least the contract would extend to aggregate amount of schedule. The lines shewn on tracing are being set out, many of which were not dealt with at contractor's request to District Engineer.

The crux of the complaint is this, that the contractor "rigged" his schedule on his knowledge of the district; and the result of the excavation turning out in his favour, he is under the impression that the Board would only extend the contract to the amount of such schedule. It is quite competent for the Board to strike out a number of lines of sewer under the terms of General Conditions, but it is questionable if such action would be equitable, as, in the event of the excavation turning out the other way, the contractor would be required to complete, as per plans.

The information obtained by the officers led to the apportioning of the excavation as 66 per cent. rock, and the balance in soil. In the absence of correct borings, it is impossible to correctly fix the quantity of each class of excavation.

The aggregate amount of contractor's schedule is £13,887; and, from careful inquiries, it is anticipated that the excavation item will be £3,000 in excess, or £16,887. The official estimate was £18,076, and the next highest schedule to Williams' was Carter and Gummow's, at £15,970.

The question to decide is whether the contract is "lump sum" or schedule. By the terms of contract and bond, it is the latter, and we are therefore bound by the schedule prices as well as the contractor. Under the circumstances I think it would only be equitable in this and adjoining contract, which is on all-fours as regards excavation, to complete the contract at the schedule rates on the same ground that if the schedule prices had turned out unfavourable for the contractor I would have called upon him to do the same.

Contract No. 86, R. and S. Butcher, is on all-fours with Contract No. 78, being let about the same time—September, 1892. Here, however, the rock excavation, of which 707 cubic yards have been executed, is 1s. per cubic yard, and excavation in soil 9s. The estimated excess on this contract will be about £1,350.

I would like to state that both contractors, pending the approval of the Minister of acceptance of contracts, carried out some lengths which were urgently required through rock formation at their schedule rates—3s. and 1s. per cubic yard, respectively, on which they lost considerably.

Some months ago I informed the Board that all contracts would be let on a different basis, viz., per cent. above or below schedule. This will effectually stop manipulating the schedule of contracts. In some instances where schedules have been so fixed the result has been unfavourable to the contractor, and resulted in a credit to the contract. I recommend that the schedule be adhered to on the foregoing grounds.

The Secretary.

J.M.S.,  
14/5/94.

Submitted to the Board, 15/5/94. The report of the Engineer was adopted.—R.B., 15/5/94. Inform. Informed No. 421, of 17/5/94. Sewerage Engineer. The contract to be carried out on lines laid down in contract, but economy is to be practiced in every instance. The lines on western side are to be pushed on without delay, and not left to the last.—J.M.S., 21/5/94. Assistant Engineer. Voucher No. 2,259, in favour of R. and S. Butcher, for £1,360, forwarded to the Treasury 15/8/94 for payment (5th progress payment).—M.G., 20/8/94. The Secretary.

There is one matter I should like to mention. Mr. Davis asked me a question as to a certain contract, and I was misled as to the date. In that respect I should like to amend my evidence. Mr. Davis alluded to Cook and Webb's contract. The copy which misled me showed that the date of letting was 28th March, 1895, whereas, as a matter of fact, it should have been 1894; so that the Government Construction Branch certainly got the first contract out under the new system. Our first contract under that system was not let until some time afterwards. I should like, also, to mention that, Mr. Hickson being a member of the Board and also Engineer-in-Chief for Construction, this matter was discussed by him and by me for some time. He had noticed in his Department, as I had in mine, that this manipulating of schedules was going on, and, as I mentioned in my evidence the other day, we tried to check it. I claim no originality for the new system.

13339. It had been in vogue for some time in your Water Branch, had it not? As a matter of fact, the Water Branch had carried out the system since 1888 in small contracts.

WEDNESDAY, 19 AUGUST, 1896.

James Morrison Dean sworn and examined:—

13340. *Mr. Parkes.*] What is your occupation? I am a partner in the firm of Alexander Dean and Sons, builders and contractors. J. M. Dean.

13341. Have you tendered on many occasions for Government work? Not on many.

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13341½. Did you tender for sewerage contract 69? Yes.

13342. When you tendered, did you notice in the schedule the number of different kinds of excavation and other things of that sort? Yes.

13343. Did you take the schedule as being a distinct intimation that such work would be carried out? Yes; I understood that more or less of each item would be done.

13344. Did you understand that any item would be eliminated? No.

13345. Will you look at Carter, Gummow, & Co's. prices according to the schedule upon page 67 of the Parliamentary return;—you have seen those prices? Yes.

13346. Upon pages 133 and 134 you will see the 16th progress return? Yes.

13347. You will notice that in connection with items Nos. 8, 11, 12, 14, 16, and 19, of the excavation their prices were 27s. 6d. for each item? Yes.

13348. What prices did you put down for 8 and 11? 18s. for No. 8, and 25s. for No. 11.

13349. Will you look at item 16 and tell me what Carter, Gummow, & Co. put down for that? £2.

13350. What price did you put down? 12s.

13351. Were you prepared to carry out the work at that price? Yes.

13352. You are quite sure of that? Quite.

13353. Then look at item 36—squared bluestone pitchers;—what was your price for that? 30s.

13354.

J. M. Dean. 13354. Will you turn to page 105;—you will there see the following clause dealing with squared bluestone pitchers:—  
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Squared bluestone pitchers, in channel bottoms, round manhole covers, ventilating-grates, valve-covers, and where ordered in any situation in the construction of these works, to be set in sand, in regular 9-inch courses, lengthwise across the channel, in the most approved bond, and in single-ring or course round manhole-covers, &c. All stones to be dressed and picked so as to ensure the joints all through not to exceed  $\frac{1}{2}$  inch in thickness. No stone to be less than 9 inches x 9 inches x 9 inches, but to be longer, curved, and radiated, as shall be directed.

Did you take it that the quantity would be regulated—that it would be more or less? Yes.

13355. What did you take the clause to mean? I took it to be provisional—that there was some uncertainty as to the quantity.

13356. Were you content with your price? Quite.

13357. Take items 23, 24, 25, 26, and 27;—what were your prices for those? You mean subducts. Our prices were 20s., 10s., 15s., 18s., and 20s., respectively.

13358. What did you include in those prices? The piping and the excavation.

13359. And the labour? Yes.

13360. You included everything in connection with the subducts? Yes.

13361. No portion of them went into any other items? No.

13362. Why did you put that price upon them? Because, from reading the specification, we took it that the excavation was included.

13363. Did you visit the site at all? Yes; my brother and I went out.

13364. Did you form any opinion as to whether the subducts were required or not? I cannot say that we did; but, the items being in the schedule, we took it that a certain quantity would be required. It is over two years ago now, and I cannot state the exact reason why we arrived at the conclusion we did. We took it, however, that, subducts being in the schedule, a certain number of them would be required.

13365. If you had known the true bearing of these items—that a certain number of them would have been eliminated as against others—would that have affected your tender? We should not have cared to take the risk unless we had certain knowledge given by the Department that such and such things would not be done.

13366. Did you ever experience tendering such as that of Carter, Gummow, & Co. in this case? This was the first tender we ever sent in in connection with sewerage work.

13367. What do you think of such tendering? I cannot understand it.

13368. Would you be likely to tender again where such tendering was allowed? We gave up tendering with the Water and Sewerage Department some time ago.

13369. Why? We thought we had not sufficient knowledge of sewerage matters.

13370. For no other reason? I do not think so.

13371. You could never come near the prices? No.

13372. But could you expect to come near the prices if tendering such as that of Carter, Gummow, & Co. were allowed? No, I do not think we could. We estimated a fair price, as we thought, for each item.

13373. Did you consider that you would be allowed to speculate on any of the items? No.

13374. Have you ever met with anything of this sort in private practice? No.

13375. And you have tendered upon schedules? Yes.

13376. Do you think that a tender such as that of Carter, Gummow, & Co. would be accepted by a private firm? I do not think so. I do not think a schedule would be made out in this way in private competition.

13377. When I drew your attention to the schedule some months ago, did you make any remark to me? I cannot say that I remember it; I may have done so.

13378. Did you not say that that accounted for your being unable to get Government work? Yes, I admit that.

13379. Are you aware, if your tender had been accepted upon the items upon which Carter, Gummow, & Co.'s tender was accepted, that, with all the additional work put in, you would be £800 less than they were in your tender? I understood so from seeing Mr. Thompson's quantities.

13380. In the original form of tender, would you have been able to beat them if your prices had been taken upon these special items? I do not think so.

13381. Not with reductions? I have not worked it out. I understand that we worked out at about £3,000 below; I was informed so.

13382. *His Honor.*] You never entertained the idea of, and you never had any experience in, what is known as schedule-rigging? No.

13383. That is outside of your line altogether? Yes; the whole matter of sewerage construction is outside of our line; but business was quiet, and we thought we would tender for sewerage work as others were doing so.

13384. You never heard of such a thing in any other line of tendering? No; it was totally foreign to our knowledge.

13385. *Mr. Davis.*] I suppose that before you put in your tender you looked carefully through the specification? Yes.

13386. Do you say now that you are under a misconception in regard to the subducts, and that therefore your price was higher than it otherwise would have been? Yes.

13387. That is your explanation of your price for subducts? Yes.

13388. What would you say with regard to item No. 21—timber and iron in excavation? We thought we were giving a fair estimate for that. We were high, as it happened, in comparison with the others.

13389. It being the case that you put an exceptionally high price upon timber and iron in excavation, and also upon subducts, and no doubt other things, would that not explain why you were generally out of sewerage-work contracts? These particular items I admit we were high in, but I do not think we were exceptionally high, taking the whole schedule.

13390. Take your item No. 1—excavation in shafts;—what was your price for that? 3s.

13391. What was Carter, Gummow, & Co.'s price? 9d.

13392. Take item No. 2—excavation, hard;—what is your price for that? 12s.

13393. And what is Carter, Gummow, & Co.'s price? 9d.

13394. So that you would be above them in soft and hard excavation? Yes.

13395. Look now at item 14—excavation in hard rock, heavier blasting;—what is your price for that? 20s.

13396. What was Carter, Gummow, & Co.'s price? 4s. 13397.

13397. So that in some cases your prices would be higher than Carter, Gummow, & Co.; in other cases they would be higher than you? We put in a fair price for each item, thinking that it would be carried out. J. M. Dean.

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13398. You put in such rates as you could live at? Yes.

13399. I suppose you will admit, from your knowledge of work in general, that, if a contractor has had special experience in any particular kind of work, he would have an advantage over other men who might have had special experience in other kinds of work? Most decidedly.

13400. Take your own case: you have had special experience in large buildings; and Carter, Gummow, & Co., from their special experience in sewerage matters, would have an advantage over you in sewerage matters? Yes.

13401. Do you not think that that explains a great deal? It may explain certain items. I admit that in regard to the two items to which you have referred—timber and subducts—Carter, Gummow, & Co. seem to have had better knowledge than we had. Of course, speaking generally, we give way to Carter, Gummow, & Co. in their knowledge of sewerage matters.

William James Millner sworn and examined:—

13402. *Mr. Davis.*] What is your position? I am a civil engineer.

W. J. Millner.

13403. What is your position in the Department? I am Assistant Engineer at the present time.

13404. In your official capacity, you frequently have to do with contractors? Yes.

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13405. And you come across contractors who are carrying out work as well as those who are not carrying it out? I do.

13406. Do you remember meeting Mr. Williams, the contractor, a short time ago? I do.

13407. Where was it? I met him several times.

13408. Do you remember how long ago it is since you met him in King-street? About two months, I should think.

13409. Who were present? Mr. Ewing, Mr. Madison, and Mr. Wright.

13410. What took place on that occasion between yourself and Mr. Williams? Nothing took place specially between myself and Mr. Williams. There was a general conversation with reference to the Commission.

13411. Did Mr. Williams express his opinion? Very decidedly.

13412. Did the others express their opinion? They had nothing to say.

13413. Did you express your opinion? I had something to say.

13414. Will you tell us first of all what Mr. Williams said, and in what connection? I cannot exactly relate all the conversation which took place. I know he wound up by saying that the only object he had in the thing was to remove Mr. Hickson and Mr. Davis from the Department.

13415. Did he give any reason for saying that? No; one thing led up to another.

13416. You positively swear that he did say that? Yes. He was talking on behalf of the different contractors. He constantly used the word "We." For instance, he would say "Our object," and then again, "We intend to get Davis and Hickson shifted," and so on.

13417. Did he say why? He did not give any definite reason. I said I thought he was bringing a lot of personal spite into the matter when he expressed himself in that way.

13418. Do you remember meeting Mr. Williams in the street last Saturday? Yes; he stopped me.

13419. Where was that? Opposite the Post Office, in Moore-street.

13420. What occurred then? There were some conversation. He said "I see you repeated to Mr. Davis the conversation we had"; and he added "I think you put it a bit stronger than what I said." I said I did not think so. He said he had not said what Mr. Davis had accused him of saying, but I told him that I had only related what had taken place.

13421. Did you lead him to suppose that you regretted having told me? He said he thought it was rather a mean trick to repeat a private conversation. I said that if he and the others considered it a private conversation, I regretted having mentioned the matter without first speaking to them.

13422. When you told me of it, did you not do so with the object of bringing the matter before the Commission when Mr. Williams was examined? I told you with the object of letting you know how the feeling stood.

13423. Did you not know that I was going to ask Mr. Williams about it? I said that if Mr. Williams were examined you might remember it.

13424. And after Mr. Williams' examination did you not ask me if I had asked him about the matter? I cannot say whether I did so or not.

13425. But it was with your concurrence that I asked Mr. Williams about the matter? Yes.

13426. When the Johnstone's Creek work was being executed you had to pass Mr. Williams' house on your way down to the work? Yes; I must have passed his house three or four times.

13427. You had charge of that work for portion of the time? I had.

14428. Did you see him frequently during that time? I might have seen him on about half-a-dozen occasions.

13429. Mr. Williams, in answer to question No. 13276, said:—

As a matter of fact, was it not Mr. Millner who gave you a lot of particulars about Government contracts which you gave to me? He was the first man who told me of the putting in of the storm-water drain at Johnstone's Creek by the unemployed. He used to pass my house nearly every time he went across in that direction, and he told me once that the unemployed were cutting a drain for Carter, Gummow, & Co. He told me that Mr. Davis was actually against the work being done by the unemployed, but that Mr. Hickson passed it.

What have you to say as to that? It is not true.

13430. Did you on any occasion have a conversation with Mr. Williams relating to the drain which was cut by the unemployed? Yes; we had one conversation, which I remember pretty well. He asked me about the cost of it. He said "I see they say it was £70, but I suppose five or six times that amount would be nearer the cost." I said "You know, Williams, you can make figures prove anything. You made them prove something to your advantage in the Glebe contract."

13431. Did you yourself say that the work, instead of costing £70, had cost £400; No; I never told him that.

W. J. Millner. 13432. Did you tell him that you would take the responsibility of the works being carried out? I do take all the responsibility.

19 Aug., 1896. 13433. Mr. Williams gave the following evidence,—

13278. Was Mr. Millner also the gentleman who gave you most reliable information—information which you most relied upon—as to the action of the Department with regard to Carter, Gummow, & Co.'s extensively-rigged schedule? Yes; he told me about that affair. He told me, also, with regard to Carter, Gummow, & Co.'s contract, that Mr. Davis condemned the use of the sandstone taken from the district in connection with the contract, but that Mr. Hickson also passed that.

13279. The conversation among the lot of you was one of general condemnation? Yes; Mr. Millner said he would not take the responsibility of doing it.

Is that true? No.

13434. Did you tell him that I had refused to sanction the cutting of the drain at Johnstone's Creek, and that Mr. Hickson, in spite of what I had to say in the matter, passed it? No; I could not have said that.

13435. Was it the fact? No; it was not the fact.

13436. Will you tell His Honor how the question of cutting the drain arose? It arose upon my recommendation to Mr. Davis.

13437. Then it was you who raised the question of cutting the drain first of all? Yes, I went to you and I said that it was not fair that the pumping should go on drowning the contract out. They were pumping and working alternately, and I thought it would be better for the pumping to stop until after that portion of the work was in, and that if they did not discontinue pumping some provision should be made to take their own water away without its being thrown on to the contract.

13438. Had the contractors made provision for dealing with the water on the contract? Yes; they had two steam pumps there.

13439. Was that ample to deal with all the water that would drain into their excavation? They kept that down all right.

13440. But would it deal with the additional water they got from the sand pumps? No, it would not.

13441. When you had reported the matter to me there was an end of it as far as you were concerned? Yes; you said you would see the Engineer-in-Chief and get him to go out and look at the work, and ascertain whether what I represented was reasonable. I remember that you went out, and when you came back you told me that the matter would be put all right.

13442. *His Honor.*] Did Mr. Hickson go out and look at the work? Yes, he went with Mr. Davis.

13443. *Mr. Davis.*] Did you at any time have a conversation with Mr. Williams as to the rigging of schedules? We had talked about it on several occasions. He prides himself very much upon the way in which he on one occasion rigged a schedule.

13444. Could you tell His Honor what you said to him in reference to that matter? I could not remember the words now.

13445. Did you say anything to him which he could make use of in the way he indicates? No.

13446. Where did you speak to him about the matter? It may have come up in conversation, but I cannot recollect where.

13447. Did you ever say anything to him as to the sandstone in the district being condemned by me and passed by Mr. Hickson? No; it never was.

13448. That would not be true? It would not be true.

13449. *Mr. Parkes.*] Have you known Mr. Williams for many years? Perhaps three or four years.

13450. You are a good friend of his,—you are companionable with him? No.

13451. How often did you see him during the time you have mentioned? Perhaps six or seven times.

13452. Six or seven times in all those years? Perhaps twenty times in the three or four years; it might be fifty.

13453. Do you ever go out to his house? No.

13454. Never in your life? I have never been inside Mr. Williams' house. I looked over his new house before the building was completed. Mr. Jenkins was there, and he asked me to have a look at it.

13455. Were you the engineer supervising Contract 69? Yes.

13456. During the whole construction? No.

13457. For how long? About fifteen months.

13458. That would cover all the earlier period of construction? Yes.

13459. Did you know Mr. Williams during that time? Yes; I knew him before that contract was started.

13460. When did you tell him about the £50 a yard for bluestone pitching? I do not know that I ever told him anything about that.

13461. Will you swear that you never told him anything about that? I will swear that I never did. We may have had some conversation in reference to the matter, because it has been a general topic of conversation.

13462. You were not the person who first told him about the matter? No.

13463. You are sure of that? Certain of it.

13464. Did you ever have a drink with Mr. Williams? I have.

13465. Have you had many drinks with him? I might have had half-a-dozen.

13466. You never got into any conversation with him on those occasions? Oh, yes, we had conversations.

13467. As a matter of fact, did you not tell Mr. Williams that the rigging of schedules was causing robbery? No; I do not think so.

13468. You never said anything about the rigging of schedules causing injury, and that it ought not to be allowed? I may have said that.

13469. Did you never give Mr. Williams any information about the North Shore contracts—did you ever speak to him about them? No.

13470. Were you ever on the North Shore jobs? No; I never knew anything about them.

13471. During the time you were upon Contract 69 did you ever complain about the contractors' men;—did you ever make any complaints? That is a big order.

13472. But did you have to find fault with the work? I did have to find fault with the work sometimes.

13473. To whom did you report it? I probably had it put right myself. I do not think there was any serious complaint which would need reporting.

13474. As to Contract 118, were there any other witnesses present when you had a conversation with Mr. Williams about that? I cannot say that there were.

13475.

13475. Were you two alone when you spoke to him about the drainage being done by the unemployed? W. J. Millner.  
He may have spoken to me about it.
13476. Was anyone else present? I do not think so.
13477. Where did that happen? I could not say exactly where it was. He might have been waiting for a tram, or I might have met him in passing down to work.
13478. When you had charge of the Johnstone's Creek work? Yes.
13479. Are you still in charge of the works there? Yes.
13480. How long have you been in charge? From the start.
13481. Was there any other Government Inspector there? Yes; Mr. Lougheed.
13482. Is he still in charge? No; the work is practically finished.
13483. Was he in charge of the conduct of the work? Yes; but he was away about a fortnight.
13484. But he was there with you—you were acting together? Yes.
13485. What did the drainage cut by the unemployed cost? I could not tell you; I have not any idea.
13486. How many men were working there? I do not know.
13487. Did you not see them? No.
13488. But you were on the job? No; I was on 118.
13489. But if they were working at Johnstone's Bay they would be within sight? No; they might be working perhaps a mile away from where I was.
13490. You have said that the water was flowing in from the contractor's works;—what part of the works were going on to allow the water to flow in? Down by the tramway.
13491. Were you not inspecting that part of the work? Yes.
13492. If you were down as far as the tramway would you not notice how many men were working at the drain? No.
13493. You never looked? No.
13494. Have you sent in returns of the work done on the job? Yes.
13495. Would you not report upon that particular matter? No.
13496. As to the conversation in which you say Mr. Williams said that he wished to remove Mr. Hickson and Mr. Davis, are you aware that Mr. Williams has done no work under Mr. Hickson and Mr. Davis? I remember asking Mr. Davis whether Mr. Williams had done any work under him, and I think he said "No."
13497. Then what object would he have in wishing to remove Mr. Hickson and Mr. Davis? I could not say.
13498. Did he say he had any object in view? No; but the reply I made to him was that we all knew that Mr. Parkes had a grudge against Mr. Hickson, but that I should like to know what they had against Mr. Davis.
13499. How do you know that Mr. Parkes has a grudge against Mr. Hickson? That is the general opinion outside.
13500. But how did you come to form it? From conversations I have had with a few people.
13501. Supposing Mr. Parkes does not even know Mr. Hickson? I do not know about that. I am giving the reply I made to Mr. Williams.
13502. But on what is it founded? It is not founded on anything; it is my own opinion.
13503. But how came you to entertain that opinion;—do you know me at all? I have never seen you before that I know of.
13504. How did you come to form such an opinion? What I say is that it is generally supposed that you have a grudge against Mr. Hickson.
13505. What reason would Mr. Williams have for wishing to remove Mr. Davis from the Department? I could not say.
13506. Did he assign any reason? He said something about the treatment which had been meted out to the O'Neills.
13507. But Mr. Williams has nothing to do with the O'Neills? That is what was mentioned in the course of conversation.
13508. As a matter of fact, did not Mr. Williams say that the smaller contractors wanted to get a fair opportunity of tendering for public works? He said they wanted freedom at the tender-box.
13509. Have you ever spoken to other contractors? Yes.
13510. About these same matters? Yes; I have had several conversations with them, and they have all had a chip in.
13511. What did they tell you? I cannot say at this moment what they said.
13512. Did they mention their object in coming to me? They said it was mainly to do away with the favouritism shown to Carter, Gummow, & Co.
13513. Have you ever heard any of the other contractors make remarks to the effect that they wanted to get rid of two officers of the Department particularly? No.
13514. Have you heard any reason which would lead you to suppose they would have an object in getting rid of these particular officers? No.
13515. Did Mr. Williams say in either of the conversations you repeated that he had any venomous feeling against Mr. Hickson or Mr. Davis? No.
13516. Do you not know that, as a matter of fact, Mr. Davis is looked upon as a fair administrator of contracts? Yes; I know that he is considered strict.
13517. But he is fair and impartial? Yes.
13518. Then would there be any object in removing him, as far as the contractors are concerned? That is not for me to say.
13519. But you have attributed certain remarks to Mr. Williams, and I want to know what reason he would have for the making of such statements? I remember asking him myself what he had against Mr. Davis.
13520. And what did he say? He mentioned that Mr. Davis had tried to crush the O'Neill's, or something to that effect.
13521. And that, as far as you know, is the only reason he would have? Yes.
13522. Where did you meet Mr. Williams last Saturday? I was going across Pitt-street, near the Post Office.



- W. J. Millner. 13523. Did you stop him, or did he stop you? I was half-way across the street, when he yelled out "Here, I want you." I then walked over to the footpath. He stopped me; I did not stop him.
- 19 Aug., 1896. 13524. *Mr. Davis.*] When was it that you left Contract 69. Could you give us the date? I think it would be about April of last year.
13525. Was the excavation finished at that time in the tunnels and open cuttings? Pretty well.
13526. Was it wholly finished in the tunnels? I think so.
13527. Had you to do with making the measurements for excavation up to April, 1895? I made all the measurements for excavation with Mr. Ewing.
13528. Did you make the measurements for the contract up to the date you have named? Pretty well, I think.
13529. Can you swear that the measurements you made were correct, and that they were put into the measurement book, and there calculated with a view to their transfer on to the progress vouchers? I think so. I am not sure whether they were put into the book, but I know that I made out all the details of the work. The final measurements were made with Mr. Gibbs some six or seven months afterwards. I remember that I went over there for a day or two.
13530. Do you recollect the branch sewer leaving the eastern branch at Emily-street? Yes.
13531. What was the size of that? 3 ft. 3 in. x 2 ft. 2 in.
13532. What was the tunnel driven in? In shale.
13533. Did you put any lining in in that branch sewer? Yes.
13534. What was it packed with? Muck.
13535. Who instructed that soft earth should be put in over the brickwork? I did.
13536. What was paid for the packing? It was actually not paid for at all. In making out the certificate Mr. Snodgrass said, "We will not bother about that; if we do not get it as filling we will get it as surplus material."
13537. That is, if it were not paid for as filling, it would be paid for as surplus material, which amounted to the same thing? Yes.
13538. It was not paid for as sandstone concrete packing? No.
13539. Could you explain why it was that the freestone pitching specified and included in the schedule was not executed? It was not actually in the contract.
13540. Where was it intended for? At a place near the railway—that is in connection with a culvert. The railway was being constructed and the culvert was wanted. The work was done by McSweeney, and it was cut out of Contract 69.
13541. Then Contract 69 was let during the progress of Contract 62—McSweeney's contract—and as the Marrickville-Enfield railway was being constructed across the Illawarra road, the question arose as to whether it would not be a saving of money to get that length of sewer constructed. Was not that the case? Yes.
13542. Was the culvert constructed? Yes.
13543. In conjunction with that culvert were freestone pitchers shown? On the drawing, yes.
13544. Would those be the freestone pitchers referred to in the specification and schedule of quantities? That is the only place where they would have come in.
13545. And would that be the reason why the freestone pitchers were not carried out in connection with Contract 69? Yes.
13546. Was there any idea at any time of putting these freestone pitchers round the manhole covers, or did the specification prescribe that they should be so placed? No.
13547. The specification provided for bluestone pitchers round the manhole covers? Yes.
13548. If a witness has said that during the progress of Contract 69, as regards the filling up of the sumps, lumps of wood and all kinds of rubbish were put in instead of sandstone concrete, what would you say as to that? The wood must have been put in unknown to me, if it were put in at all; but I do not think the statement is true; one lump of wood may have gone in.
13549. Why do you say that one lump of wood may have gone in? Because it could be easily covered up. It would be quite accidental if it did get in.
13550. As far as your knowledge goes, there was no rubbish or wood of any description put into the sumps instead of sandstone concrete? No; so far as I know they have been filled in properly.
13551. Have you any reason to doubt the integrity or fidelity of the inspectors who were supposed to be on the ground supervising the work? Of course, if the inspector were there it would not be allowed; and I certainly do not think they would go out of their way to have it done.
13552. *His Honor.*] But Mr. Davis' question related to the honesty and ability of the inspectors? I think you will find as good a class of inspectors in the Sewerage Department as you will find anywhere.
13553. *Mr. Davis.*] It would be their duty to be present while the concrete was being mixed and put into position in the sumps? Yes.
13554. It would be their duty first of all to see that the sumps were cleared of all timber and wood of every description before the concrete was put into position? Yes.
13555. You have every reason to believe that that was done? Yes; I myself saw some of the sumps filled in in Contract 69, so that I feel pretty certain about the matter.
13556. Do you remember a change being made in the branch sewer leading from Premier-street to Illawarra-road? Yes, it was changed.
13557. In conjunction with the alterations made, did you make a valuation of the centering that had been made and put into position by the contractors? Yes.
13558. Do you recognise your estimate, which appears upon page 131 of the Parliamentary return? Yes, that is my estimate.
13559. Will you tell his Honor how you arrived at the £16 and the £2 10s. included in the £37 10s.—did you measure up the timber yourself? We took a general valuation as to what it was worth. The cubic feet were not actually gone into. We took the whole thing as being worth so much.
13560. With whom did you value the work? I think Mr. Ewing, or perhaps Mr. Snodgrass, was present; at any rate, one of the members of the firm.
13561. If a witness has said that he made the valuation, and that the centerings were worth something like £5 or £6, would that be correct? No.
13562. Did Darcus, who was the carpenter on that job, as you know, make the valuation, or did you? I made the valuation, with the contractors.

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13563. Had Darcus anything to do with it? He was not present at all.
13564. Did you get a valuation from Mr. Snodgrass? He wanted £25 for them, and I told him what I thought they were worth, and what I would recommend. I said "It is of no use your putting in a claim for anything more than that, because I would not recommend it."
13565. *His Honor.*] How was the £16 arrived at;—did you split the difference? We fixed a price which we thought was just and fair; there was no splitting the difference.
13566. How did you arrive at the £15 for the concrete in pats? We went by the number of gaugings that were put in.
13567. *Mr. Davis.*] Coming to the bluestone pitchers, will you tell his Honor when you first noticed that they were put down at £50 per square yard? At the time the first certificate was made out.
13568. What did you do when you observed that they were put down at such a high rate? I thought my copy must be wrong. Mr. Snodgrass, however, who was making up the progress voucher with me, assured me that the amount was right. I sent the matter into the office, and you said that I had made a serious blunder in charging £50 for the bluestone pitchers. You said that you had turned up your own copy, and that the amount given there was only 50s. You said that I would have to make out the return again. We sent down and got the bond, and saw that the copy given to Mr. Davis contained the amount of 50s., whereas in the other case it was given as £50.
13569. It was quite evident to you from what I said that I did not know the price was £50? Yes.
13570. Can you fix the date when this happened? It would be about July, 1894.
13571. That was when you had the conversation with me which you have just spoken of? Yes.
13572. *Mr. Carter.*] When any complaints were made, had you any difficulty in getting the contractors, either Mr. Madison, Mr. Ewing, or Mr. Forrest, to carry out the desired alterations? They always put things right without further trouble.
13573. Do you remember how many bluestone cubes were shown on the plan, and what was the area of each set? I could not say from memory.
13574. *Mr. Parkes.*] What was the size of the shaft opening, and what was the margin where these bluestone pitchers went;—were the manholes all circular? Not all; some were square.
13575. How many were there? I could not tell you.
13576. What quantity was taken for each manhole? There were 1.23 square yards of pitching at each manhole.
13577. You do not know how many shafts there were? I could not tell you from memory.
13578. Would there be twenty-four? I could not tell you. Up to the time I left, I think I paid for only sixteen or seventeen; I was not there until the finish of the job.
13579. What was the width of the pitching? About 9 inches.
13580. In the specification both sandstone and bluestone pitchers are specified to go in at the bottom of open channels? As far as the freestone pitching is concerned, that, as I have already explained, relates to a portion of the contract which was cut out; it was done before the contract was advertised.
13581. And why did it appear in the specification? The specification was written before the portion was cut out.
13582. As to the bluestone pitchers which were to go in at the bottom of open channels, where would they be? There were none.
13583. That was only probable work? Yes; we might have substituted bluestone for sandstone pitchers in the portion of the work which was cut out.
13584. Then there is a specification for valve covers where ordered—where would they be? In the outlet and inlet walls.
13585. You did not put bluestone there? That was done after I left.
13586. Did they put it in, do you know? I believe so; I could not say.
13587. The valve chambers would be the manhole covers? They are in the same chamber; they would be for raising up the penstock.
13588. No bluestone pitching was put into the bottoms of open channels? No. Pitching in that situation is shown only on the culvert which was carried out by Mr. McSweeney.
13589. How many sumps do you say you saw filled in? I did not inspect the work; I simply saw it going on as I was walking along.
13590. How long does it take to put in a sump? There would be six or seven mixings; it would take a couple of hours perhaps.
13591. Did you look at any in particular? No.
13592. Do you know Darcus? Yes; I know him from seeing him on the work.
13593. Did you make any measurements with him? No; all the measurements I made were with Mr. Ewing; I never made any measurements with Darcus. I do not deal with the men but only with the contractors.
13594. How are the measurements of a section of the tunnel made? We have a proper section of the sewer.
13595. That would be a drawing made before you started? No.
13596. The drawing was made then after you had given in the measurements? It would be made on the section and measurements. We put pats in all along the bottom of the sewer. A model of the sewer is then put in and the work proceeds round that. The measurements are taken upon that at every 10 ft.
13597. If you put your measurements in your inspector's book would you have any further record of those measurements;—for instance, when you give the contractor instructions as to what size you are going to pay him for each one of the sections of excavations, do you give him any written authority or plan? No.
13598. You simply measure the excavation as he has made it? We measure the excavation before the concrete lining is put in to see if it is up to size.
13599. There are no written instructions as to what you allowed;—there was no record kept of what you allowed? The plan would be made at the time.
13600. What plan is that? I saw it here yesterday. It is made during the progress of the work, as each different part was done. The sections would be plotted before the excavation was finished.
13601. Where is the record as to where the sections were plotted? I do not know; I left them behind me.
13602. But there were such records? Yes.
13603. Did you take the sections yourself? Yes, I took the sections.

13604.

- W. J. Millner. 13604. Did you send in a rough section to the Department? I gave the man who made the drawing rough sections.  
 19 Aug., 1896. 13605. In your own hand? Yes.  
 13606. What would they be on? They were on some sheets of paper, as far as I can remember.  
 13607. *His Honor.*] I understand that as you went along the sewer it was for you and the engineer, who is your superior, to determine what the size of the lining should be? When we get the shaft sunk, and we start driving, we generally instruct the contractors what lining he is to drive for. We take notice of the rock, and if we think that one-ring lining is enough we order them to drive proportionately.  
 13608. You allow then a certain margin of packing round the lining? Yes, a 3-in. margin.  
 13609. And all that they put in in excess of that is put in at their own loss? Yes.  
 13610. That is, they are not paid for it? No.  
 13611. Then what is your object in measuring if a drive has been put through after instructions? We do not give them 3 inches if it does not go to that. They are allowed only 3 inches. If it went to 2 inches, or 1 inch, that is all they would get. A portion of this particular contract was in such easy ground that the driving was very neat in places.  
 13612. What was the object of measuring the drive? To get the sections.  
 13613. What you want to see is not how little but how much the contractors have excavated? Yes.  
 13614. If you find they have excavated up to a certain amount and, then, beyond that limit, the excess excavation is at their own loss? Yes.  
 13615. So that you do not go into the maximum extent to which they have excavated? We take it just to show that we have given the measurement as we found it.  
 13616. What I mean is this—if you told the contractors to excavate 4 x 5, then anything beyond 4 x 5 would not be paid for in any way. If, under those circumstances, a contractor had knocked out a hole running 2 or 3 feet in, you would have no object in measuring that? No. We might just measure the section to show what it was. The driving might be very tight in another place, and that would make up for it. One section might be tight and another large. We do not say that the limit is to be 3 inches in any particular spot. We say that the quantity is not to exceed that.  
 13617. Your principal object in measuring is to discover that the contractor has excavated enough? Yes; to see that there is room for the lining.  
 13618. *Mr. Davis.*] As to the margin—the 3-inch margin is a new idea? Yes.  
 13619. Is there a clause limiting the packing in Contract 69? Yes; I think there is a 3-inch maximum.  
 13620. Will you look at clause 63 of Contract 77? Yes, I see that.  
 13621. Provision is made in that clause for limiting the concrete packing, over and above the excavation ordered, to the extent of 3 inches, is it not? Yes.  
 13622. Do you find that clause in Contract 69? The specifications do not appear to be the same.  
 13623. You think that clause 80 of the schedule to the specifications connected with Contract 69 limits the packing to 3 inches? Yes.  
 13624. *Mr. Carter.*] As to the measurements—did Darcus, the carpenter, ever assist you in your measurements? He never made any measurements with me in the tunnel.  
 13625. If he says he poked a measuring stick up into the deep places and left out the shallow ones he would be wrong? He might have measured the chamber excavations; after I left there was nothing but No. 1 shaft to be measured.  
 13626. *Mr. Parkes.*] On what date did you leave? I think it was about April, 1895.  
 13627. All the excavation was done then? I think it was done.  
 13628. *His Honor.*] Do you remember anything peculiar in the history of the bluestone pitchers after it was discovered that they were to be charged at the rate of £50? No; I do not recollect any.  
 13629. Was there any order—I mean, as to the way in which the manhole rings were to be put down? No; I do not remember anything special.  
 13630. Did you hear that Mr. Davis had made a suggestion that special bluestone concrete should be used instead of bluestone pitching? Yes.  
 13631. Do you remember hearing that Mr. Hickson had made any order upon that? I think the papers were sent to me in reference to that matter.  
 13632. Do you remember looking up the matter to see how many pitchers were shown upon the plan? It was looked up in the office, but not by me.  
 13633. Of course you have no idea as to how that 12 yards got into the schedule? No; that is an office matter.  
 13634. Do you remember it's being discovered that it was a mistake? Yes.  
 13635. Was it discovered in the office, or was it by you? It might have been by me; I could not say; when we came to make up the returns, we found that we should run over the quantity; the price of £50 being discovered by Mr. Davis made him look into the matter.  
 13636. You were not on the contract up to the final payment? No.

William Gilliver recalled:—

- W. Gilliver. 13637. *Mr. Parkes.*] With regard to clauses 16 and 17 of the general conditions I suppose you know them by heart? I have every reason to know those particular clauses. (*Vide Appendix No. 36.*)  
 19 Aug., 1896. 13638. Take also clause 36, which appears on page 120 of the Parliamentary return; I suppose you know that and the other clauses there very well? Yes.  
 13639. They occur in most contracts of the Government? Yes; in the Sewerage Branch.  
 13640. How do you, as a contractor, interpret those clauses? My contention has been this—that the Department could not alter the character of our work. We say that when we take a contract, with signed plans and specifications, we should be allowed to do the work. If you turn over to the tender form, I think you will see that that bears out my contention. For instance, it says “And we do hereby agree that any additions to or deductions from the said work shall be paid or allowed for, as the case may be, at and after the rates or prices mentioned in the schedule of quantities and prices annexed hereto, or if not in schedule at a price to be agreed upon at the time.” I take that to mean that if there is any variation of the contract the prices must be fixed by the clause in the contract which gives the Department power to call in an outsider to do the work if the contractor and the office cannot agree about the price.  
 13641.

13641. Have these clauses been used with an opposite effect against you? Yes.

W. Gilliver.

13642. Will you describe in what way? That is what we objected to in connection with the Rookwood contract. The plans which I now exhibit are a plan of the original work and a plan of the substituted work. I have said on a former occasion that the bridge on that contract was held in abeyance. The bridge was the only means we had of getting our material from the railway station without incurring an additional mile of cartage.

19 Aug., 1896.

13643. Had you a good price for a bridge? A very fair price; but it was not altogether the loss of profit on the bridge, but the additional loss on cartage.

13644. Who instructed you that the bridge would be knocked out of the contract? We had a letter from the Engineer-in-Chief. In the first place, after we had sent in a complaint, Mr. Davis told my partner, Mr. Curtis, that it was not likely that the bridge would be built, and that it would have to be left in abeyance for the time being. The following are copies of letters which we wrote to the Department in connection with the matter:—

J. Davis, Esq., Supervising Engineer, Sewerage Department, Sydney.

Dear Sir,

24th July, 1894.

As we are now ready to take on the work at creek, in connection with laying the iron pipes, we shall be glad to know if the piers shown on sketch sent us are to be built of sandstone or bluestone. We should also like you would fix a price for same, together with the excavation for piers. As you are aware, this class of work is entirely outside of our contract, which says, "if no price in Schedule, at a price to be agreed upon." Building these small piers will be very expensive, the whole requiring timbering, and, when complete, no measurement in them.

We are, &c.,

GILLIVER & CURTIS.

J. Davis, Esq., Supervising Engineer for Sewerage.

Sir,

August, 1894.

We beg to acknowledge the receipt of your letter of the 9th instant, wherein you say the Engineer-in-Chief has decided to support the pipes by means of piles and braces, as shown on contract drawings. Will you please say if we are to build the bridge complete, as per drawing in detail for same; or do you mean us to build only the centre piles and headstocks. If only the latter, we think you would not ask us to do it at Schedule rates for piles, as when we tendered we clearly understood the bridge was to be built as per detailed plan.

Yours obediently,

GILLIVER & CURTIS.

J. Davis, Esq., Supervising Engineer, Sewerage Construction, Public Works Department.

Sir,

15th August, 1894.

We duly received, through your Mr. Smith, your letter of 13th instant, wherein you say, respecting the erection of the bridge, you were informed at the commencement of your contract that this work was not to be done. We admit your telling our Mr. Curtis it was doubtful if the bridge would be built. In the face of this, how can you expect us to erect a part—the most difficult—of the bridge at our schedule for piles, girders, &c.? We have no objection to build any portion if you will give us a price that will even cover the actual cost. We think that Mr. Hickson, the Engineer-in-Chief, would not ask us to do this work without an increased price. We might as well be asked, in fairness to us, to build the invert of tunnel only as this part of bridge, more especially in the face of the fact of your saying it was not to be erected.

Yours faithfully,

GILLIVER & CURTIS.

J. Davis, Esq., Supervising Engineer, Sewerage Branch, Department of Public Works.

Sir,

21st August, 1894.

Your letter of the 20th instant duly to hand, wherein you direct us to erect piles for pipe supports across creek.

We will at once take the work in hand and build as you direct; but it is understood that we do it under protest—our contending that you are entirely departing from contract. We have signed to do the work in accordance with plans and specifications, and amongst others we signed plans of bridge; and, by your directing us to build a *portion only*, you are, in our humble opinion, entirely altering the character of the work we contracted to do. We need hardly point out that the portion of bridge you have instructed us to build is the most expensive portion, and consider that it is beyond any doubt unfair to us, except at a price to be agreed on, as per contract for work outside of Schedule.

We are, Sir,

Yours obediently,

GILLIVER & CURTIS.

Mr. W. Smith, Resident Engineer.

Dear Sir,

25th October, 1894.

Can you make it convenient to call here at once. The piers of brickwork in creek are at a standstill, owing to the whole of the bricks having to be cut by your inspector's order. We would not do the labour for the 60s. per cubic yard, much less find the material.

We understood that Mr. Davis arranged with us that the piers were to be built perpendicular.

Pending your arrival, we have stopped the work, as we cannot conceive that you can expect us to do the work in this way.

Yours truly,

GILLIVER & CURTIS,

(per G. B. S.)

13645. Was the bridge built after the contract was completed? It is in course of construction now. The Secretary for Public Works gave the local Council £100 towards the erection of it.

13646. So that in that case the Engineer-in-Chief did alter the contract? Yes; he wrote to us and referred to the clause in the contract giving him the power to do so.

13647. Clause 16 I suppose he meant? Yes.

13648. That is the clause quoted by Mr. Hickson? Yes.

13649. Do you know of any other instance of the kind? Yes. Upon the same contract the plans will show concrete round the earthenware pipes. Afterwards we put in the top with concrete and left the bottom out. That was entirely different from the contract plan.

13650. *His Honor.*] Was the bottom portion filled in with different material? No; the pipes were bedded in earth in the usual way.

13651. *Mr. Parkes.*] One of the letters from the Engineer-in-Chief to which you refer would be as follows:—"Gentlemen,—In reply to your letter of 15th instant respecting the supports for carrying the cast-iron pipes across the creek, I have the honor to inform you that the matter has again been laid before the Engineer-in-Chief, and he directs me to state that he does not agree with you that an injustice is being done you in asking you to do work which was specified and is included in the Schedule of prices attached to the contract. Will you therefore please carry out the work as directed.—Yours obediently, J. DAVIS."

Another one was in these terms:—"Gentlemen,—In reply to your letter of 24th ultimo as to the price as arranged for the concrete and excavation required for the piers under the cast-iron pipes at the crossing of the creek I have the honor to inform you that, as you appear not disposed to carry out the work referred to at Schedule rates for concrete and excavation, the Engineer-in-Chief has decided to support these pipes as shown by the contract drawing, viz., by means of piles and braces, prices for which are included in the Schedule

- W. Gilliver. schedule attached to the contract. Will you therefore please execute the work accordingly. I have the honor to be, gentlemen, your obedient servant, J. DAVIS." Yes; we should have had to get a pile engine, ram, &c., at a cost of £60 or £70, and £1 a foot would not have paid us for that portion of the work.
13652. Was clause 16 the clause upon which that decision was made? Yes, I take it to be so. I may say that I remember seeing Mr. Davis personally more than once about the matter, and pointing out the additional expense to which we were put in carting the material. The bridge was to be left in abeyance until the contract was completed. I think we put in a claim of £80 for extra haulage on account of the non-erection of the bridge, and a sum of £40 for loss of profit. The other claims were allowed by Mr. Davis as far as he could allow them, but I went to see the Engineer-in-Chief, and he disallowed these. I had not an interview of more than one minute's duration with him. He had apparently made up his mind what he would do in the matter.
13653. Did he state the clause under which he acted? He told me that he had thrashed the matter out previously and was tired of it, or something of that kind.
13654. And he would not sanction it? No; his mind was apparently made up.
13655. *Mr. Davis.*] You are an alderman of Rookwood? Yes.
13656. So that you know a good deal about this bridge apart from the fact of your being a member of the firm of Gilliver and Curtis? Yes; I have been living in the district for the last ten years, and I know pretty well the whole country round there.
13657. Do you know what was the object of leaving out the bridge? To save expense, I take it.
13658. You did not gather that the motive was to oppress you? No. We were perfectly satisfied that the bridge would be left out after Mr. Hickson had given his decision; but at one of the meetings of contractors which took place at Mr. Parkes' rooms, I heard one of the contractors say that the Engineer-in-Chief had allowed Carter, Gummow, & Co. to do the whole of the bluestone pitchers upon Contract 69 at £50 per square yard. Then the bridge came into my mind. The rule I go on in the matter is, that what is good for one contractor is good for another. I take it that all contractors should be dealt with fairly and justly.
13659. Did it not occur to you that the cases of the bridge and the bluestone pitchers were rather different? Not in the slightest; you could have substituted bluestone concrete round the manhole covers. There is a place on the Parramatta Road upon which there is probably more traffic than upon any other road in the Colony, and in the centre of the road there is a manhole cover with special concrete round it.
13660. Did you regard the two cases as being parallel? I regarded them as being on all fours; one decision being given as regards one contractor, and a directly opposite decision as regards another.
13661. You would say, would you not, that the clause to which Mr. Parkes referred gave the Engineer-in-Chief power to alter or substitute work where in his judgment that was necessary? That was his rule with us.
13662. Is that your opinion? He has done so with us; but there has been a decision given by the full court in Queensland, and that is why I have written so strongly about the matter. The point was referred home, I think. It was decided there that the Government had no power to alter a contract once the plans and specifications were signed. That is what was running through my mind at the time I wrote so much about it.
13663. Have you ever compared the Queensland contract with the contracts you have had under the Sewerage Department? Only in my mind.
13664. So that there might be substantial differences? I have the specifications belonging to some Queensland contracts, but I have never actually compared the two.
13665. Then there might be a substantial difference? There might be.
13666. Would you consider it a legitimate use to make of the clauses to which you have referred, to take advantage of the prices that are given in the schedule, and to execute work at a low price or at a high price, just to suit the Department? I do not think for one moment that you would do it. You have always give us fair play. I believe you are a perfectly straight man. I do not want to flatter you, but I think you are an honest man. That at all events is my experience of you. You have allowed us in the seven or eight contracts we have carried out fair play. There is no doubt in the world about that; but what I say is that, as regards the decisions of the Engineer-in-Chief, what is good for one contractor is good for another.
13667. Coming to the bridge itself, when it was decided not to construct the bridge, and you received the first sketch—taking the concrete prices, you wanted a special rate for concrete? Yes.
13668. And then the Department, in order that we might get our pipes supported in such a way as to cover the contract, ordered you to revert to the piles—is not that so? You were very undecided about it. In one case you sent us a sketch for the building of concrete piers with six piles.
13669. And the second time you got instructions as to supporting the pipes it was with piles? Yes, the letters will show what happened.
13670. Coming to the brickwork, was it not put in at your suggestion so as to get over the difficulty? We had £3 a yard for brickwork, and I think there were 8 cubic yards when it was cubed out. We wanted to get the contract completed. I suppose you know that we are not in the habit of being behind-hand with any contract we take up. We always wish to be beforehand, instead of coming cap-in-hand to the Department to ask for an extension of time. I remember writing to you and saying that we would go on with the work at once, but that we considered that you were departing from the contract.
13671. But in regard to the brickwork, was it not put in in order to get over the difficulty? I think Mr. Smith and yourself suggested the brickwork in the first place.
13672. And you concurred? Yes, under pressure.
13673. I would like to ask you one more question about Mr. Hickson. Did not Mr. Hickson treat you fairly when he considered your proposal to take on the extension of Contract 70, amounting to almost as much as the original contract? We asked to be allowed to do the extension. As to the Parramatta contract, our price was 20·78 per cent. below schedule, and we offered to take the extension of it because we were on the ground, and we had men there we did not know what to do with. We were prepared to take it on, but you would not give it to us, and called for tenders. We tendered at 10 per cent. below and got the contract. My object in writing to you was that we had a good deal of plant on the ground, and also men. I believe myself that if tenders had been invited we should have got from 15 to 20 per cent. more for the work.

13674. It answered your purpose to get the extension, and Mr. Hickson recommended it? Yes; we said he could do it more cheaply than anyone else. W. Gilliver.  
19 Aug., 1896.
13675. That occurred after the bridge was cut out of the Bookwood contract? Yes; the bridge was in abeyance. From the time the tender was accepted by Mr. Lyne up to sketch you sent us the bridge was in abeyance. We did not know whether we should have to build it or not. You had told Mr. Curtis, I believe, that it probably would not be built.
13676. *Mr. Carter.*] When you put in your claim against the Government, or when you entered your protest regarding the bridge, there was a very large sum of money involved? No; directly and indirectly, probably £200.
13677. Taking the bluestone pitchers on our contract, a very much larger amount would have been involved there? But instead of your having 12 yards as specified in the schedule, you were allowed four times that quantity.
13678. Suppose the amount of profit involved in the bluestone pitchers amounted to £2,000, and you had been in our position, would you then have dropped your claim so easily as you dropped it when it had reference to the comparatively small amount of £200? We never dropped it. The matter was left in abeyance until the contract was complete. Then we put in our claim for extras and loss of profit on not building the bridge and approaches, and extra cost of cartage through the non-erection of the bridge; but we got nothing in connection with the bridge.
13679. Eventually you dropped it? We were wiped out.
13680. Is it not often the case with all contractors that as regards small amounts the Department often tries to bluff us out of them? I cannot say that. I have nothing to complain about in that respect—absolutely nothing.
13681. But do they not often try to bluff us out of small amounts? No; as regards the Harbours and Rivers, Railways, and Sewerage, Departments, I have nothing to complain about, but I do not think it is fair for the Engineer-in-Chief to give one decision for one firm of contractors and one decision for another.
13682. You see that 12 yards of bluestone pitchers are provided for in the schedule, but it has been proved that we were only paid for the exact quantity shown upon the drawing;—which would you claim upon in such a case, the drawings or the schedule? But the question is, were they in the drawing when you tendered. It is easy to fix up these matters you know.
13683. I mean the drawing that we signed? If there are the number you say in the drawing, how is it that there are only 12 yards shown in the schedule. That is not our experience. I do not want to do you any harm. I am merely fighting a principle.
13684. *His Honor.*] Supposing the larger number were shown in the original drawing, and that only twelve were shown in the schedule? My experience is this—that the quantity shown upon the drawing would be the quantity shown upon the schedule.
13685. Supposing a mistake were made? I do not know anything about that.
13686. Supposing that such a mistake had occurred and had been admitted, would you not claim to be allowed to carry out the quantities according to the drawing, and not according to the schedule? It is not for me to say what I would do.
13687. *Mr. Parkes.*] Did you ever notice, in the specification, clause 113, which is as follows:—
286. It is hereby expressly understood that the contractor is bound to completely and thoroughly inform himself of every circumstance connected with or relating to the work, and of the correctness or otherwise of any information contained in or supplied by the drawings or specification; as he shall have no claim on account of any errors, omissions, or inaccuracies, that may be found in these documents after the contract shall have been signed, and since he has to provide in his tender for every contingency that may arise.
- The contractor must himself compare the copies of drawings and specifications supplied to him, under clause 4 of the general conditions, with the original, as no claim will be allowed for any errors therein.
- ? I always thought that under the contract the department could practically make a contractor do whatever they like.
13688. Under this remarkable clause? Yes.
13689. There is plenty of provision to safeguard the public? Seemingly so.

Joseph Davis recalled and further examined:—

13690. *Mr. Parkes.*] Mr. Bagge, in his evidence, spoke of an aqueduct carrying pipes at either Rose Bay or Double Bay which he once inspected with you;—can you locate the work to which he refers? I do not know to what he refers; there is nothing of the kind at Darling Point or at Rose Bay. J. Davis.  
19 Aug., 1896.
13691. But do you not remember going out with him to see an aqueduct? I have been out with him many times; we have frequently been out together.
13692. But do you not remember going to one particular work at Double Bay? There is a short length of the Waverley and Woollahra branch sewer constructed on arches at that point.
13693. Did you go to see that work with Mr. Bagge? I remember going there with him on one occasion; when we got there we found that improper bricks were being used, and, what was more, we found that these bricks were laid on the centres with the intention of grouting the joints, no compo. being used; whether Mr. Bagge refers to that or not I do not know.
13694. Were those arches cracked? One of the arches had cracked a little; that, I think, was due to contraction.
13695. Was the work taken down? Yes; the brickwork I have spoken of; I forget now who the Inspector was; I know that the matter was fully dealt with; the bricks were condemned, and were finally taken off the works.
13696. Were the arches taken down and rebuilt? I do not think so—in fact, I think I am quite right in saying that they were not; I think a crack occurred at the end of the aqueduct. I will tell you to the best of my recollection what took place. There were four arches of probably from 15 to 20 feet span; they were finished on to the southern side of the valley, where there was a tunnel; the tunnel was the last part of the work, and after it had been finished the balance of the aqueduct was put in; it was at the junction that the crack occurred; the crack developed a long time after the junction was made, and before the embankment was put over. I do not know whether that is what Mr. Bagge referred to. What I think he refers to is something which occurred in the culvert at that same place.



- J. Davis. 13697. What occurred there? On the upper side of the sewer, to enable the drainage above the embankment to pass under the sewer, there was a culvert. The portion of the culvert on the up-stream side was built upon rock, but on the lower side of the sewer, on the down-stream side, the foundation was exceptionally bad. A portion of the culvert, therefore, was built upon rock, and the balance of it was built upon very bad ground.
13698. Which contract was that? Contract 53—Carter & Co.'s. The best job possible was made of the foundation before the culvert was put in. There was a lot of rubble from the tunnel put in to consolidate it, and the culvert, which was very light, was put on, and stood all right until the embankment was put on. When the bank was put on, it proved too much for the foundation, and it settled a little in one corner, causing a crack near the springing of the arch.
13699. Had that to be pulled down? I believe a portion was taken down; but it was not done at the contractors' expense. The contractors had absolutely nothing to do with it. If it were taken down it would be done at the expense of the Department; but I would not be sure now of what was done in the matter. The thing happened a long time ago, and I should have to look at the papers before I could say positively what did happen.
13700. Was not the greater portion of the aqueduct carrying the pipes taken down and put up again? There were no pipes; it was simply a concrete structure, with the exception of the arch of the sewer, which was of brick.
13701. It was what you would call an egg-shaped sewer, and would answer the same purpose as a pipe? Yes.
13702. Was it not taken down and put up again? Not to the best of my recollection: very little, if any, was taken down. To the best of my belief the work done was of a very trifling character, and would not have amounted, as a whole, to more than a few shillings in value. That is the only place to which I think Mr. Bagge can refer, although I admit that from the description of the work which he gave I cannot identify it.
13703. *His Honor.*] Was there never any question of bad mortar in connection with this particular work? There was the bad brickwork of which I have spoken.
13704. Would that be bad bricks or bad mortar? Bad bricks—they were not properly jointed. They were simply laid upon the centering with the intention of pouring the grouting on to them. That is not bricklaying at all.
13705. *Mr. Parkes.*] Were the arches cracked? They were all right with the exception of the crack to which I have referred, at the junction.
13706. *His Honor.*] The brickwork to which you have referred was in the same arches? Yes; there were four arches, I think, going across the valley where the sewer crosses the Chinese gardens, just below the Edgecliffe Road.
13707. And it was in the building of these arches that defective work was found—defective bricklaying work, bad bricks being used—there being grouting instead of trowelling? Yes; but I think you misunderstand. The defective brickwork was not in the arches themselves, but in the arch of the sewer. The arches themselves were of concrete.
13708. *Mr. Parkes.*] Mr. Bagge said that sand had been used instead of cement, and that the arches were taken down? Yes; I have heard him give his evidence.
13709. *Mr. Carter.*] Do you remember exactly where the defective brickwork occurred—did it not occur some hundred yards further on towards the Bondi sewer instead of in the arches of which you have spoken;—as a matter of fact, was not the defective work in an open cutting, and not in an embankment at all? The sewer from the main Bondi sewer up to the valley is treated in the same way, and I should not like to say at this moment where the bad work occurred—whether over the arches or in the sewer leading up to the arches.
13710. You do not remember definitely whether the defective work of which you speak was in the open cutting? It may have been in the open cutting leading up to the arches, but it does not make any difference, because the brickwork had nothing whatever to do with the arches; it was part of the sewer.
13711. As to the arches themselves, the whole thing was a trivial matter? A very small affair.
13712. So small that we have all forgotten about it? Yes.
13713. *His Honor.*] Do I understand that all the arches are covered up with an embankment? Yes; the failure of the culvert was entirely due to the foundation. The difficulty was to know what to do with it without going to a good deal of expense in piling. The arch that carried the sewer corresponded with the arch of the culvert on each side of it.
13714. Then the culvert extended out from the sewer—from one of the arches bearing the sewer to the edge of the embankment? Yes, to form a waterway.
13715. *Mr. Carter.*] You do not remember the inspector who had to do with the defective brickwork? I believe it was McDonald; but I would not like to say positively.
13716. You may recollect, perhaps, that the grouting was carried out by the inspector's orders, and that there was some trouble about it afterwards? I think it was Hamilton who was doing the work now I come to think of it; he has not since been in charge of work of that description.
13717. Did the Department sack him? I believe he was suspended, but he was finally brought back at about half money and given work of a very inferior kind.
13718. You do not remember whether he actually ordered the work to be done in the way in which you found it, in opposition to the bricklayers' wishes? I believe the whole responsibility lay with him. First of all, he had passed the bricks; and, so far as the bricks were concerned, therefore, we were in the contractors' hands. Then he ordered the work to be done in the way I have described. Of course, the contractors were not to blame, except that their men traded on the man's ignorance.
13719. *His Honor.*] What was the matter with the bricks? They were very rough, to begin with. They were badly made, and the material in the bricks themselves was really bad; they were third or fourth rate bricks.
13720. Were they radiated bricks? Yes, specially made for sewer work.
13721. *Mr. Carter.*] Suppose we had taken a determined stand against the alteration of this particular piece of work, should we not have been justified in doing so, seeing that your inspector had passed it? Not only did the inspector pass the bricks, but I think the papers will show that he went to the brickyard and passed them before they left the yard. I made a recommendation that the bricks should be condemned in



in spite of the fact that we were in the contractors' hands. I felt so very strongly about the quality of the bricks that, let the consequences be what they might, I thought they ought not to be put into the work.

J. Davis.  
19 Aug., 1896.

13722. *His Honor.*] Were they not put into the work? No.

13723. Was any compensation paid to the contractors? To the best of my recollection none was paid.

13724. *Mr. Parkes.*] Were the contractors paid for alterations to the culvert or bridge or arches? Not for alterations as far as the culvert itself was concerned. To the best of my recollection we did that ourselves.

13725. *His Honor.*] What Mr. Bagge says is this, that he recollects your taking him out to show him some concrete arches to see how well they would stand, but that when you got there you found something wrong with the work. You cannot remember anything of that kind? I think myself that Mr. Bagge has muddled the two things together. He has the brickwork mixed up in his mind with what occurred at the culvert. I remember that he did go out with me, and, as regards the brickwork, he quite agreed with what I did; furthermore, I remember that he went out to look at the culvert. I wanted his opinion as to the cause of what had happened, although it was a little matter, still it was a failure in the work; and I regarded it as important to get his opinion as to the cause of the failure.

John Carter, recalled and further examined:—

13726. *Mr. Parkes.*] In questioning Mr. Bagge on the last day on which the commission sat you asked him if he did not recollect the collapse of a culvert on a work of yours, and whether the department did not pay the contractors for it, because it was due to their faulty design. Can you give any explanation of that matter? The thing explains itself. What I had in my mind was this—that some five or six years ago there had been some trifling dispute over this particular culvert. I was under the impression that we substituted concrete foundations under one of the piers, and that we were paid for it. I am not positive upon the point.

J. Carter.  
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13727. Was it in an aqueduct? There were a series of small arches carrying the sewer across a small creek in Double Bay Valley.

13728. What happened? One of the abutments or piers of the arches and culvert at the creek settled a little owing to the soft foundation.

13729. Were the arches cracked? No.

13730. Did not the settlement crack the arches? Not that I know of; it may have done so after I last saw the work.

13731. Was the work all taken down again? No; certainly not.

13732. How much was taken down? Nothing; a little sandstone or bluestone concrete was put under one of the piers to give it a bearing on the muddy foundation.

13733. *His Honor.*] Was it a pier of the culvert only? For one corner of the culvert. It acted as a sort of pier for the arches above.

13734. Was it part of the pier that carried the sewer, or was it a pier which carried the culvert and the bank? I am referring to the culvert. I know nothing about the arches at all, that is from the point of view of bad work. I do not believe anything did occur as to the arches. As to the defective brickwork I am positive that the brickwork which was condemned by Mr. Davis was 100 yards further on, and had no connection with the arches.

13735. It was further to the north? Yes.

13736. Does not the aqueduct come very near the main sewer? It is 15 or 20 chains away.

13737. This sewer meets it at right angles? Yes; I think Mr. Bagge referred to the arch of the sewer when he spoke of defective work. I do not think he referred to the arches in the valley at all.

13738. What was wrong with the brickwork? It was simply filled in with grouting. Mr. Bagge said something about picking it out, and I quite believe that he could.

13739. Was that altered? Yes.

13740. Were you paid for it? No.

13741. How came the grouting to be done? I think it was done by the consent and instructions of the supervising inspector, who was ignorant of that particular part of the work. We were in the position of having brought passed material to the ground, and having carried out the work according to the inspector's ideas. Afterwards the work was condemned, and we replaced it at our own cost.

13742. Were not your men trying to play a trick on the inspector? It is very likely that they took advantage of his ignorance, but they did as he told them. Personally, I know nothing about the matter.

13743. *Mr. Parkes:* It is possible to put bricks in position dry and grout them up afterwards? Not in tunnel work.

13744. Not if you had your centre underneath the arch? I only say that I am not a practical bricklayer, and know nothing about those matters.

13745. *His Honor:* Who was in charge of that part of the work for you? Mr. Snodgrass.

13746. In personal charge? Yes. Mr. Forrest would also be there; he might remember something that occurred.

13747. It may be that Mr. Forrest and Mr. Snodgrass took advantage of the inspector? It is very probable. It is only human nature that if they struck an ignorant man they would take advantage of him as much as they possibly could.

Edward Hungerford recalled and further examined:—

13748. *Mr. Parkes.*] You have made inquiry at my request concerning the claim paid to M'Namarra, the wool scourer, in connection with Contract 72. Will you describe how that claim for stoppage of water-flow came up? I do not think I can. It was a Harbours and Rivers matter, and had no connection at all with Contract 72.

E. Hungerford.  
19 Aug., 1896.

13749. But it was owing to the work upon Contract 72? I do not think so.

13750. The matter was contained in the portfolio comprising the papers in connection with No. 72? The Contract 72 papers were called for in connection with the Harbours and Rivers case; but the case, as far as I know, was in connection with the Shea's Creek canal.

13751. But it was in connection with Contract 72 that the stoppage of flow took place? I could not say anything as to that. That is a matter for an engineer.

13752.

E.  
Hungerford.  
19 Aug., 1896.

13752. But do not your papers show it? I have not the papers, but I asked the Crown Solicitor whether anything had been paid, and he said that nothing had been paid yet, because there were certain counter-claims to be settled.

13753. Have you a statement in connection with the amount of costs which has already been paid in connection with the case? The only statement which I am able to make in connection with the case is contained in the document which I handed you this morning, and which is as follows:—

|               |                     | MACNAMARA v. THE QUEEN. |    |    |              |                     |            |
|---------------|---------------------|-------------------------|----|----|--------------|---------------------|------------|
|               |                     | £                       | s. | d. |              |                     |            |
| 1894.         |                     |                         |    |    | 1895.        |                     |            |
| June ...      | Crown Solicitor ... | 500                     | 0  | 0  | March ...    | Brought forward ... |            |
| " ...         | J. Robertson ...    | 26                      | 5  | 0  | December ... | Crown Solicitor ... |            |
| July ...      | E. Beadell ...      | 1                       | 0  | 0  | " ...        | Sir J. Salomons ... |            |
| " ...         | Crown Solicitor ... | 1,000                   | 0  | 0  | " ...        | J. Garland ...      |            |
| " ...         | T. Houghton ...     | 12                      | 12 | 0  | 1896.        |                     |            |
| September ... | Crown Solicitor ... | 300                     | 0  | 0  | February ... | E. Barton ...       |            |
|               |                     |                         |    |    | April ...    | Crown Solicitor ... |            |
|               |                     |                         |    |    | " ...        | J. Garland ...      |            |
|               |                     |                         |    |    | June ...     | Rowe and Curtis ... |            |
|               |                     |                         |    |    | " ...        | H. S. Williams ...  |            |
|               | Carried forward     | £1,839                  | 17 | 0  |              | Total               | £6,142 2 7 |

These are the amounts which have passed through the books of the Works Department. Most of them have been placed to the credit of the Crown Solicitor for meeting law expenses.

13754. They are all legal claims? The Crown Solicitor is the only man who could say that.

13755. What money has been paid to Macnamara? None yet.

13756. The case is still in litigation? At your request, I asked the Crown Solicitor this morning whether anything had been paid, and he said that nothing had been paid yet.

13757. Did you get information as to whether the case was settled? He said he could not reply to that question, because the clerk who dealt with the matter was out.

13758. There is no further information you can give me on the point? No; it had nothing whatever to do with sewerage matters, so that it never came under my notice.

Joseph Davis recalled and further examined:—

J. Davis.  
19 Aug., 1896.

13759 *Mr. Parkes.*] Clause 83 of the specification, upon page 92 of the Parliamentary Return, is as follows:—

In all cases where a greater thickness of lining, or a greater cross-section area of tunnel or shaft, is ordered to be executed, from whatever cause, after the length of tunnel or shaft in question has been excavated to the profile ordered in the first instance, the excess of excavation so ordered shall be paid for at schedule rates for tunnel or shaft excavation as the case may be, and as the Engineer shall classify and direct at the time. If such extra excavation, in the opinion of the Engineer, shall require special timbering and shoring, the same shall be dealt with in strict accordance with clause 114.

Turn now to clause 114, upon page 95, you will see that it is as follows:—

*Shoring, Timbering, Piling, Temporary Bridges, &c.*—During the excavation for sewers, buildings, piers of aqueduct, abutments, storm-water channels, shafts, cast-iron cylinders, &c., the contractor to adopt every precaution, and provide all materials, as planking, strutting, shoring, timbering, piling, sheet-piling, all packing materials, as straw, asphalted felt, bags, tarred gasket, puddle, &c., and all labour; and carefully execute, at his own cost (unless where otherwise specified), all piling, sheet-piling, &c., as shown on drawings; and, where ordered, and wherever considered necessary by the Engineer, and to his entire satisfaction, all sheet-piling, temporary scaffolding, staging, bridges (over rivers, creeks, water-courses, and open drains, underneath lines of railways, tramways, streets, or footpaths, so as to ensure during the period of the contract the undisturbed traffic and flow of water as the case may be in all channels, drains, water-courses, creeks, or rivers, and the undisturbed traffic along all railways, tramways, streets, &c.), and strong shoring, and in sandy, water-charged, or loose soil, close timbering, piling, and sheet-piling; and provide all appliances, and have all packing materials, as above enumerated, close to where they are required, and with the same carefully and securely close up and pack against the outside of the timbering all joints and open spaces between poling-boards, sheet-piles, or wedges, wherever they occur, and caulk open joints where directed, and execute whatever may be required to prevent any buildings, or other superstructures, road and other surfaces over and adjacent to the line of sewer, from settling, cracking, being shaken, slipping, or falling in, and to prevent any portion of the floors, sides, roofs, and end faces, of excavation, beyond the exact cross sections and dimensions determined on, from slipping, falling, running in, or being forced through joints and open spaces in the timbering and sheet-piling, and maintain said timbering, piling, shoring, temporary bridges, &c., where and when directed, till completion of the works, to the entire satisfaction of the Engineer.

What is the meaning of those two clauses? Clause 83 has reference to cases where, after the tunnel is driven, it is found necessary for some unforeseen reason to enlarge the tunnel. Clause 114 deals generally with shoring, timbering, bridges, and so on—work which has to be done by the contractors at their own expense unless the engineer for some reason or other thinks it impracticable to withdraw the timber which has been put in. He may order it to be covered up, and in that case it is paid for at schedule rates.

13760. Where is the clause which says that it shall be paid for? Clause 115 on page 96. You must take that clause in conjunction with clause 116.

13761. But you seldom withdraw the timber? It is very difficult and dangerous to withdraw it in the case of tunnelling, and in that case it has to be paid for. In the case of open cutting it is usually withdrawn, and in that case it is not paid for.

13762. Clause 284, which appears upon page 113 of the Parliamentary Return, is to this effect:—

It is to be distinctly understood that, on completion of the works, the Engineer shall have the power of ordering and having the main sewers, or portions of same, &c., closed, in such order as he shall direct, and the whole of the sewers and aqueduct tubes, &c., filled with water for such a time as he may deem necessary, for the purpose of testing the works; and any injuries, faults of whatsoever description, leakage, breakage, &c., of valves, tubes, pipes, iron, masonry, brickwork, concrete-work, &c., caused by or detected in consequence of such testing to the work, of every description, joints, &c., shall be at once repaired, replaced by new work where ordered, and made good. The whole expense incurred, in plant, materials, and labour required to replace with new work, effect repairs, and make good, any faults, leakage, damage or injuries to any portion of the works, shall be borne solely by the contractor; and after the completion of these repairs, replacing with new works, and making good any damages, injuries, faults, &c., the whole of the works shall again be tested, as before described, until they shall have been proved perfectly watertight, sound, clean, and in first-class working condition, to the entire satisfaction of the Engineer. If the result of the test or examination be satisfactory, the work will be formally taken over by the Engineer, who will issue a certificate to that effect, whereupon the period of maintenance shall begin.

Is that test ever carried out? Yes.

13763.

13763. Was it carried out in the case of Contract 69? There was no necessity for it, I think, but I would not be sure. I was not in charge at that time. The only case where it would apply in that contract would be the syphon at the Illawarra Road. It is probable that that may have been tested.

J. Davis.  
19 Aug., 1896.

13764. Is not the clause to apply to the whole of the work? There is a qualification giving the Engineer power to order. The object is to test aqueducts and things of that kind which would be above ground. All those tubes at Arncliffe, for instance, were tested.

13765. Was 101 tested? That I do not know; it was taken over while I was out of the Sewerage.

13766. What quantity of water would be over each of the arches supposing the sewer were full? I could only give you the quantity approximately at a moment's notice; but, as a matter of fact, the sewer never would be full. I suppose you mean the quantity when the sewer is charged up to the flow line?

13767. What is the meaning of clause 286 of the specification upon page 113 of the Parliamentary return;—does not that throw the responsibility upon the shoulders of the contractor of accepting any incongruities in the plan and specification? I think the whole intention of the specification, from beginning to end, is to put everything possible upon the shoulders of the contractor. The question is whether some of these clauses do not almost nullify themselves by their severity. You would have to take into consideration in conjunction with a clause like that what was equitable and just.

13768. Would not that clause assist you in equalising the payment in the case of such an extravagant charge as £50 a yard for bluestone pitchers? It might be brought forward as an argument.

13769. But would it not hold good if you used it? Really I do not know. It might be my opinion that it would or that it would not, but I do not know that that would make very much difference. That, I think, is rather a question of law.

13770. But you have to administer the contracts? I would go strictly according to the specification until I was stopped, consistently with doing what would be equitable and right. I do not see how you could have any other clause than that one in the specification. No doubt it is a very severe clause, and the object is to put the responsibility on the contractors.

13771. You know the clause dealing with bluestone pitchers, on page 105 of the Parliamentary return? Yes.

13772. You, and also Mr. Hickson, have said that you had the power to do almost exactly what you liked in that matter? It means that we have the power to have them put in any other situation than the places mentioned by the specification.

13773. There is no reason why you should not have declined to order them to be put round the man-holes? That is another question. The specification specially states that they are to be put round the manhole covers, and the drawings with the exception of a few instances show it.

13774. Coming to clause 72, when that contract was started, if anything occurred, according to this specification, by which the channel which the contractors had excavated were filled by flood-water, the responsibility would lie upon the contractors, would it not? Yes and no; I would say both; but, speaking generally, certainly yes. The contractor would have to take all the responsibility of completing the work in accordance with the plan and specification, and handing it over to the department in perfect trim as far as it could be perfect, but circumstances might arise which would modify that to some extent.

13775. But do you not throw the entire responsibility upon the shoulders of the contractors according to your specification? Yes; the intention is to put all the responsibility we can upon the shoulders of the contractors.

13776. What clause is that? I think you will find it in the general conditions.

13777. Do not those clauses make it imperative upon the contractor to make good any damage from flood-water? Any ordinary damage, certainly.

13778. Was this not a case in which, owing to the carelessness of the contractor, his trenches were filled? Not to my knowledge.

13779. Was not a certain length filled up with flood? Not to my knowledge.

13780. Were you supervising engineer when this work was carried out? Yes.

13781. Who was the engineer in charge of the work? There were two or three men in charge, but I know all about it.

13782. Was there no correspondence about the silting up of the channel? There was no correspondence about the filling up of the channel, but there was correspondence with reference to the deposit of some earth in a channel running along the line of the Shea's Creek canal.

13783. But it was in a sewer channel, was it not? It was in work excavated by Carter & Co.

13784. For a sewer channel? As an outlet for the channel.

13785. The flood filled up the trench? No; I do not say that it filled it, but it deposited a small quantity of earth in the bottom of the channel excavated.

13786. For what length? Principally at the ends, but the channel would be affected for 20 chains or so.

13787. There is a clause in the specification of 72 Contract—clause 4, upon page 152 of the Parliamentary Return, which is as follows:—

The contractor is to execute in like manner and with the same quality of materials, as provided for the works expressly mentioned in specification and drawings, any extensions, additions, deviations, alterations, or extra works, which the Engineer may require by an order in writing.

The work executed under this clause will be measured up and paid for at schedule rates in the same manner as provided for the other works under this contract; and, if it comprise any work not specified in contract and in schedule of prices, a special agreement shall be made between the Engineer and the contractor, and signed, at the time of giving the order for such work.

In case the above-named parties shall be unable to agree on the value of such extra work, the Engineer shall be at liberty and fully authorised to have it executed by whomsoever he may think fit.

No extra work, extensions, or any additions, deviations, or alterations whatever, which may be claimed by contractor, will be recognised or admitted under any circumstances, if done or executed without, or contrary to, an order in writing from the Engineer as aforesaid, and the production of such order shall be a condition precedent to contractor's receiving payment for them.

The Minister, or the Engineer acting on his behalf, may from time to time by writing under his hand require the omission of any particular portion or part of the works described in the specification or shown on drawings; and the contractor shall have no claim for loss of profit, sustained damage, or other compensation, on account of any such omission.

You could, according to that clause, take out a portion of the work? It is a general clause, such as you will see in all public works contracts.

J. Davis. 13788. Take clause 3, upon page 141 :—  
19 Aug., 1896.

3. It is to be understood that the lower 13 or 27 chains of the channel shall not be constructed until the Engineer gives a written order to that effect; and the Engineer shall have the power to suspend the execution of these portions of the work, or any other part of the contract, or to reduce the length of the contract by the extent of the said 13 or 27 chains, or any other part of the sewer shown on the drawings that he may consider necessary, and the contract shall not thereby be invalidated, nor shall the contractor be entitled to any compensation on account of such temporary suspension of any part or parts of the contract or permanent reduction of same.

What do you say as to that? That is partly special and partly general. The special part of it refers to the lower part of the channel. The general part of it is simply a reiteration of what you have read from the general conditions.

13789. *His Honor.*] What is the reason of funds at the time these contracts were advertised. We did not know what the tenders would be, but we knew what the estimate was. We knew that the estimate was higher than the funds at our disposal to cover the work, and that proviso was put into the contract to reduce it when the tenders came in, supposing the tenders were for a greater amount than we had money to cover. That is the reason why 13 and 27 chains at the lower end of the channel were mentioned.

13790. How is it that 13 and 27 chains were the special lengths provided for? Mr. Bagge, at the time the specification was drafted, thought that either 13 or 27 chains might be omitted. If we got a very favourable tender in, it was thought that we might have done the whole of it. If not, then we could omit the 13 chains. If we got a very big tender, involving a large expenditure, then it would be necessary, in order to bring ourselves within the amount which we had in hand, to omit the 27 chains at the lower end of the channel.

13791. These lengths represented particular points? Yes, they were supposed to discharge at convenient spots.

13792. *Mr. Carter.*] Referring to Mr. Parkes' question as to the responsibility of contractors for damage done by storm-water, or anything of that kind, suppose your Department, or the Harbours and Rivers Department, came along and pumped the whole of our works full of silt and water, could you reasonably ask us to take the responsibility of all that, and to clean it out from time to time? I do not think it would be a reasonable thing to do.

13793. So that you would have no right to interfere with the land in the neighbourhood of where we were working until our contract was completed;—you would have to leave it practically in the same condition as when the contract was signed? Yes. Speaking as a layman, I think that if we did anything, and damage resulted, there might be another way of looking at it. You would have an action at law against us the same as would any other individual.

FRIDAY, 21 AUGUST, 1896.

Richard Green sworn and examined :—

R. Green. 13794. *Mr. Parkes.*] What is your occupation? I am working at anything I can get just now. I do bossing sometimes.

13795. Have you had any experience of working in sewers? Yes; I have been working in sewers on and off between seventeen and eighteen years.

13796. Have you worked in sewerage works in any other colony besides New South Wales? I was working four-and-a-half years in Christchurch, New Zealand.

13797. Where have you been working mostly? I did some work for Mr. Rhodes, at Alexandria. Before that I was bossing on the sandhills. I was also bossing for Wilmott and Morgan for nearly three years off and on.

13798. In the formation of sewers is concrete a good material, unless it be of a very superior order? It is all right if it is properly mixed. Then, no doubt, it is a good thing.

13799. In the formation of a sewer is it better to put in an invert of concrete with an arch of brick, or what do you think? If you put concrete into a sewer great care must be taken in the way in which it is put in. You must not let one lot of concrete stand and then put another concrete on the top of it, because if you do that the two pieces of work will never unite, and you will probably have a leak.

13800. Do you know of an instance of defective concrete work in sewerage construction? I remember that at Bondi, under Mr. M'Mordie, the concrete gave way at the springing to such an extent that Mr. M'Mordie could put his rule right into the work.

13801. What was done in that case? It sank below the foundations, and we put a good body of concrete in, as much as we could get in back to the timber to make it solid again.

13802. It is necessary, in your opinion, to have the most superior kind of concrete for sewer construction? Yes. Bluestone is supposed to be stronger than sandstone, because of the porous nature of the sandstone. It would take more cement in the case of sandstone than in the case of bluestone concrete, unless the sandstone be very hard.

13803. You think the sandstone would absorb more cement? Yes; because it is more porous.

13804. Have you any idea what quantity of concrete a man ought to mix in a day if he mixes it properly? He must be a good man if he mixes a gauge in an hour.

13805. Will you describe the method of mixing which you have generally seen adopted? The stone is turned out of the gauge-box, and the sand and cement added. The material is then turned over twice dry and twice wet. It is then removed from the board to the place where it has to go into the work. He must be a good man who will mix the gauge in less than an hour. A man ought to put about 8 yards in position, but a good deal depends upon what the work is like.

13806. Have you ever known instances where excessive returns have been made of gaugings? I do not know any more than this. The Inspector on the works will take a note of what is done in the way of concreting—that is to say, how many gaugings have been done in the day's concreting. That, I believe, is entered in the Inspector's book every night.

13807. Do you know whether it is the custom in sewerage contracts to pay men extra if they manage to get in a greater number of concrete gaugings than could be fairly done? A strong man at the board will get another sixpence. I have seen a leading man at the board get a little extra in that way.

13808.

13808. Does he get that for putting in improper material? No doubt the contractors do not give it to him for nothing. R. Green.
13809. Did you work upon any part of Carter, Gummow, & Co.'s contracts? I worked on the Glebe job, but I had nothing to do with the concrete there. I worked also on the Camperdown job. 21 Aug., 1896.
13810. Have you seen concrete mixed on any of their jobs? I have seen them putting it down on several occasions on different jobs on which I have not been working.
13811. Did you notice whether, on those occasions, the concrete was well mixed? I have seen it in many cases turned twice dry and then shovelled down the shaft.
13812. You say you have worked at the Glebe? I worked there under M'Lean. I and some others sank the shaft at the top of Bay-street. Then I went to work at Camperdown and sank a shaft for Mr. Gummow there. He then wanted us to start a drive at 25s. a yard, but we would not go at that price. Two of the men working with me at that job have since died. We then went back to the Glebe to work, and we sank a shaft at Lillie Bridge Hill, and later on I went back to the Glebe. I know nothing about the concrete on that job, except that I have heard it said that a piano-case was put into the bottom of one of the sump holes.
13813. It is customary to fill the sump-holes with concrete? They are supposed to be sunk 6 feet deep. I do not know about the filling of them afterwards.
13814. Do you know of any case where they have been filled with concrete? Well, I have heard it said that they are filled up with rubbish; but I cannot prove anything of the kind. I do not know anything about it.
13815. Did you ever hear of a man named Coyle speak of the way in which he had filled up a sump-hole? No; I do not think he was on the concrete.
13816. Did Coyle ever tell you that defective work was done? No; a man named James once said something to me about it, but I cannot prove anything.
13817. In the case of Contract No. 72—the Shea's Creek job, do you know how they mixed the concrete? I was not working there; but not being at work at the time I was often over there, and I saw a lot of dirt and stuff being shovelled up with the stone which went in with the concrete.
13818. Have you a good knowledge as to how concrete ought to be mixed? Yes. I take it that my experience of twenty or thirty years ought to tell me how concrete should be mixed.
13819. How was the concrete mixed, in your opinion, on the Shea's Creek job? I have no fault to find with the mixing. What I find fault with is the kind of stuff which was put into the concrete. You know that when sandstone is broken a lot of it goes very small, almost like sand. The stuff was shovelled up from the ground where it had been broken, and with it was a lot of sand and dirt.
13820. What effect would that have upon the cement? Well, there would be more sand in the work than there ought to be to begin with, to say nothing of the dirt; and the sand, I should say, would take the strength out of the cement in any case.
13821. Have you noticed whether, as a rule, there are experienced men on these works as inspectors? A man named Andrews was inspector at Camperdown. He is a bricklayer by trade. There was also quite a young fellow there who was inspector. He was certainly not an experienced man—in the case of miners, anyway.
13822. In the contracts in which you have worked, has special care been taken to have good work put into the sewers? As regards looking after the work, I have nothing to say against the inspectors. I have nothing to say against them as a rule, but you cannot expect, for instance, a man who does not know anything about shooting to know whether a man has enough stuff in a hole to shift the ground or not.
13823. But is the concrete that goes into these sewerage works always of the best? No doubt the Emu Plains gravel makes the best concrete you can have.
13824. But what do you think of the sandstone concrete which you have seen generally used? As I have said, I have always understood that sandstone concrete, on account of its spongy nature, should have more cement put into it than you would put into bluestone concrete.
13825. Can you give us any idea from conversation you have heard as to the shaft at the bottom of which the piano-case would be likely to be found? That is only talk. I have no proof of it.
13826. Who is the man who is supposed to have put it down the sump-hole? I do not know who did the concreting on that job. Coyle was there fetting, but I do not know whether he had anything to do with the concreting or not. I was not on the job a great while.
13827. Have you any men in your gang at Katoomba who have been working for Messrs. Carter, Gummow, & Co.? There are men who have been doing sinking for them, but none, I think, who have done any concreting.
13828. Do you know of any men who have lately gone on to the works upon which you are now engaged who have been working on Carter-Gummow's contracts? There is a man named George Somers.
13829. Where did he come from? He was doing sewerage work. I believe he was gauging for bricklayers for some years. He has been working at Woodford for some time. He is working in the cutting above me now.
13830. Have you noticed whether concrete which has been put in the sewers shrinks or not? I do not know about its shrinking, but concrete which has lain any time has not the same tendency to set which it would otherwise have.
13831. Have you noticed whether sandstone concrete shrinks more than bluestone concrete? I have not had sufficient experience to speak as to that.
13832. *Mr. Davis.*] Where are you working now? At Katoomba.
13833. When did you come down? Last night.
13834. Specially to give evidence? Yes; on summons.
13835. Referring to the shooting, and your objection that some of our inspectors are not able to properly supervise it. Suppose a clause of the specification provides that a certain charge of compressed powder, and no larger charge than that, shall be put into a hole, would not most of our inspectors be intelligent enough to know when such a charge was put in? The young fellow to whom I refer never used to come down to see us in any case. Andrews had not had any experience in shooting. It was the first contract he was on where shooting had taken place.
13836. Would it take a man very long to know whether a 4-inch or 6-inch charge of compressed powder were used? Sometimes when there is an insufficient charge it makes a loud report, and an inexperienced inspector would, perhaps, think that there was a greater charge than there ought to be. 13837.

- R. Green. 13837. You think that, at all events, an inspector would be able to tell whether there were two or three plugs in or only one? I should think so.
- 21 Aug., 1896. 13838. As to the forking, which you say did not take place upon Contract No. 72, supposing the metal is not specified to be forked? If it is not specified to be forked they would not be doing wrong in shovelling it.
13839. As to putting the concrete down the shafts, you said that it was usual to turn the material twice dry, and then put it down the shaft without turning it wet? Yes; I have seen that done.
13840. Do you not think that if concrete which is being put down a particular shaft has to fall, say, from 70 to 100 feet, that that would be a good way of mixing it? No doubt the stones fly all over the ground when it gets down the shaft. In many cases the concrete has not the labour put into it which it ought to have. I worked at concreting for Lemon and Spencer. Reid, who was the inspector there, made us turn it over twice dry and twice wet, and it was then put down the shaft. But in hundreds of cases I have seen it done the other way.
13841. Have you ever examined the concrete when it got to the bottom of a shaft? I have seen it, but I have never examined it.
13842. Have you not noticed that the sand, cement, and stone have been thoroughly incorporated? There is no doubt about there being sand and cement, but the stone, as I have said, would fly about all over the place.
13843. When you said that the contractors paid a little more to a man supposing he were a strong man at the concrete board, what did you mean;—did you mean us to infer that he got the extra money for doing extra work? They would be given an extra 6d. to push along, and get as much done as they could.
13844. As to the Bondi sewer, do you know what caused the trouble there? Pumping underneath it, I think.
13845. That caused a settlement, you think? Not only that, but if concrete stands for three or four months, and you then put new concrete on the top of it, it never unites properly.
13846. You think there is no union between new concrete and old? That is so.
13847. As to the crack of which you have spoken, and into which you say Mr. M'Mordie put his rule, at the springing of the arch, you think that that was caused through settlement? Yes.
13848. *His Honor.*] The sewer was constructed in sand? Yes.
13849. *Mr. Carter.*] Did you ever work for us—concreting? No.
13850. So that you know nothing from actual experience of what occurred upon our works as to that particular class of work? No.
13851. As to that historical piano-case, I should like to ask you a few questions? I do not know anything about it.
13852. Would it not be rather a difficult matter to get it down the sump hole in the first instance? You could get it down a 6 foot by 6 foot shaft all right, and you know that it would take up the room of two or three yards of concrete. You could get a piano-case for 7s. 6d. perhaps.
13853. Do you not know that we are paying 15s. for them, and that they are being sold by one contractor to another for £1 each? You ought to be able to get as many as you want for £1 each.
13854. They are kept on the jobs for tools? Yes.
13155. As a matter of fact, what you have heard about the piano-case is merely hearsay;—it is only talk? Yes.
13856. As to the shovelling of metal on the Shea's Creek job,—do you not know that it was broken on clean, short grass? Yes; but as it is broken it makes a lot of sand, and when the men come to take it up they take up a lot of rubbish with it. If you go there now you will find that the place is full of holes where the stone was broken and shovelled up.

Joseph Davis recalled and further examined:—

- J. Davis. 13857. *Mr. Parkes.*] As to Contract No. 53, was there any condemned cement upon that contract;—I mean the contract referred to by Mr. Bagge the other day? The contract was in the course of construction for over two years, and I think it is probable that during that time there might be a good deal of cement that would be condemned. On one occasion I remember that they had some Kangaroo cement on the job at Double Bay, if that is the contract to which you refer. The first lot delivered on to the work was approved, and the second lot was condemned. I remember that distinctly. It is very likely that some of the other cement was condemned.
13858. But was there not some cement condemned about the time the bricks which have been referred to were condemned? It would be impossible for me to say now.
13859. I mean about the time the aqueduct was built? It would be impossible to say without referring to the papers.
13860. Have you any correspondence with reference to defective work on Contract No. 53? It is possible that Carter & Co. may have written as to the condemnation of the bricks; I think they did.
13861. Did they write in reference to the condemnation of the cement? It is not usual to do so. The cement would be submitted for testing. If it passed the test, well and good; if it did not pass the test, it would be condemned, and would be ordered to be removed from the work.
13862. Is there any correspondence in the office at all with reference to Contract No. 53? There would be no correspondence about the brickwork itself, because that was pulled down and the bricks were condemned, and taken off the work. There would be something about the bricks, either in the journal or in the papers.
13863. Was the cement which was condemned taken from Carter and Gummow's works to one of the Water and Sewerage Board's contracts? Not to my knowledge. I do not know the condemned cement to which you refer.
13864. Did you not condemn some cement upon the contract about the time you condemned the bricks? I have already said that no doubt there would be cement condemned during the course of the contract, but to what extent, and on what dates, I could not say without looking up the information.
13865. Will you obtain for the Commission all the information you can as to the condemned cement? I will endeavour to do so.
13866. Would the intimation to the contractors about the bad bricks be in writing? The bricks were condemned, but whether the contractors were informed verbally or in writing, I do not know. They would probably be informed in writing.
- 13867.

13867. And would they also have been informed of any alteration you wanted them to make in the grouting of the brickwork? That was done in violation of the contract.

13868. But your intimation to them would be in writing? I should have to look into the matter before I could say.

13869. *His Honor.*] If an engineer hears that something is going on in connection with a contract, and if on going out to the work he finds that there is something wrong, and there and then gives a verbal order in reference to the matter, would there be afterwards any letter written? In some important cases there would be. In other cases an entry might be just made in the journal. It would be impossible to keep a record of everything that occurred in connection with a contract.

13870. Anything important, however, would go into the journal, you think? Yes.

13871. The journal would virtually contain a history of the whole thing? Yes. In this case, I think, the journal would be found to give Mr. Parkes the whole of the information he wants concerning the bricks.

13872. *Mr. Carter.*] Referring to condemned cement, you are aware that sewerage contractors purchase cement at the merchant's risk—that is to say, it has to undergo the Government test before the contractor actually takes possession of it? I believe that they purchase the cement provisionally.

13873. So that if it is condemned the merchant would be at the expense of carting it back to the city? Yes.

13874. It would not, therefore, be to the advantage of the contractor to try to use it? No; I have always understood that what you say is the custom among all the contractors.

J. Davis.  
21 Aug., 1896.

George Christie recalled and further examined:—

13875. *Mr. Parkes.*] You have prepared a statement setting forth facts relating to the financial position of the sureties in connection with Contract 77, as illustrated by affidavits and by information which has been tendered to the Commission, showing also their position at the time at which they became sureties, and their position at the present time? Yes. I have prepared the following report:—

G. Christie.  
21 Aug., 1896.

MEMO. NO. 19.

RELATIVE to the financial position of Messrs. James Gillan and George Forrest on 16th May, 1895, on which date they gave separate bonds in the penal sum of £6,000 each in connection with the maintenance of the works comprised in Contract No. 77.

(a) The clause of the "supplementary specification" under which these bonds were required is as follows:—

The contractors shall continue to maintain the said works at their own cost after the period of maintenance set forth in the general conditions for a further period of three years, computed from such date, to the satisfaction of the Engineer, whose decision shall be final and conclusive upon all points concerning workmanship and materials, and the permanency and durability of the said works; and the contractors shall enter into a bond to Her Majesty the Queen in the penal sum of £12,000, and find two sufficient sureties to enter into separate bonds in the penal sum of £6,000 each, to secure the removal of so much of the said works as shall have been constructed on the "Monier system," if the Engineer shall be dissatisfied with the same at any time during the said periods of maintenance, and to re-erect and construct the said works at their own cost and expense in accordance in all things with the specification, schedule to specification, and plans therein referred to; within thirty-nine weeks from the date of being called upon so to do.

(b) The bonds were completed on 16th May, 1895, and the statutory declarations made by James Gillan and George Forrest were as follows:—

*Statutory Declaration.*

I, JAMES GILLAN, of Dulwich Hill, in the Colony of New South Wales, householder, do hereby solemnly declare and affirm that I am possessed of property to the value of £6,000 sterling and more, and that such property consists of cash at bankers, freehold and other property. And I make this solemn declaration as to the matters aforesaid according to the law in this behalf made, and subject to the punishment by law provided for any wilfully false statement in any such declaration.

Taken and declared at Sydney this 27th day }  
of May, 1895, before me,—

JAMES GILLAN.

HAROLD F. NORRIE, J.P.

*Statutory Declaration.*

I, GEORGE FORREST, of Marrickville, in the Colony of New South Wales, householder, do hereby solemnly declare and affirm that I am possessed of property to the value of £6,000 sterling and more, and that such property consists of—Freehold property, £5,700; cash in bank, £300 sterling. And I make this solemn declaration as to the matters aforesaid according to the law in this behalf made, and subject to the punishment by law provided for any wilfully false statement in any such declaration.

Taken and declared at Marrickville, this 1st day }  
of June, 1895, before me,—

GEO. FORREST.

ROBERT ANDERSON, J.P.

(c) A statutory declaration made by James Gillan, in Adelaide, on 17/7/96, was put in evidence on 31/7/96. This declaration is as follows:—

IN THE MATTER OF THE PUBLIC WORKS INQUIRY COMMISSION.

I, JAMES GILLAN, of Clarendon, in the province of South Australia, contractor, do solemnly and sincerely declare as follows:—

1. All the property now beneficially held by me is of the value of not less than £6,000, as I verily believe, and consists of the items following, that is to say:—

|  |                |
|--|----------------|
| In the Bank of New Zealand at Adelaide .....   | Approximately. |
| In the Bank of New Zealand at Sydney .....   | £550 0 0       |
| Bank fixed deposit receipts and interest .....   | 115 0 0        |
| Personal effects in South Australia, including furniture, piano, horse, harness, and sundries—market value ..... | 1,015 0 0      |
| Six shares in Adelaide prospecting syndicate—market value .....  | 300 0 0        |
| Shares in Town and Country Building Society, Sydney—market value .....   | 60 0 0         |
| Money due me by Carter, Gummow, & Co., for money lent .....  | 50 0 0         |
| My interest as partner of Carter, Gummow, & Co., in the surplus assets of that firm .....                        | 1,000 0 0      |
|  | 3,100 0 0      |
|  | £6,190 0 0     |

2. My personal liabilities, exclusive of my liability (if any) under the bond for £6,000 executed in or about the month of May, 1895, do not exceed £20 to the best of my knowledge, information, and belief.

3. There are no mortgages or bills of sale on any of my said property.

And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of an Act made and passed in the sixth year of the reign of His Majesty King William the Fourth, intituled "An Act to Repeal



G. Christie. Repeal an Act of the present Session of Parliament, intituled 'An Act for the more effectual Abolition of Oaths and Affirmations taken and made in various Departments of the State, and to substitute Declarations in lieu thereof, and for the more entire suppression of Voluntary and Extra-Judicial Oaths and Affidavits, and to make other provisions for the abolition of unnecessary Oaths.'

21 Aug., 1896.

JAMES GILLAN.

Declared at Adelaide the 17th day of July, 1896, before me,—

WM. HENDERSON,  
Notary Public.

The total of the eight items which comprise the property stated by Mr. Gillan to be held by him on that date amounts to £6,190; but of this sum £4,100 was due to him as a partner of Carter, Gummow, & Co. Of the remaining £2,090, £910 consists of cash and personal property definitely outside of this Colony. As to the bank fixed deposit, £1,015, it is not stated where or with what bank that amount is invested. The only definite items of property in New South Wales are thus (according to his declaration) reduced to £115 in the Bank of New Zealand, Sydney, and shares in the Town and Country Building Society set down at £50.

(d) From the attached statement furnished by the Bank of New Zealand, Sydney, it would appear that, at the date of the execution of the bond, James Gillan had a credit balance with that bank of £48 13s. 6d.

(e) It will be noticed that Mr. Gillan's statutory declaration, made in connection with his bond, is dated 27/5/95, whereas his bond is dated 16/5/95, eleven days previously.

In that declaration he says that his property consists of "cash at bankers, freehold and other property." But Mr. Gillan's declaration, dated Adelaide 17/7/96, does not include in his assets any freehold property. Furthermore, in his declaration of 27/5/95, Mr. Gillan is described as "of Dulwich Hill, in the Colony of New South Wales, householder," though at that time he was resident at Adelaide.

(f) It will also be noticed that Mr. George Forrest's statutory declaration, in connection with his bond of 16/5/95, is dated some sixteen days subsequently, namely, on 1/6/95.

(g) Mr. Forrest gave evidence before the Commission relative to his declaration on 26/6/96 and 3/7/96. In that evidence he stated that he had an interest in a property known as "The Lodge," at North Shore, and that he owned certain property at Dunedin. Subsequent evidence has shown that "The Lodge" at North Shore is valued at £7,500, is mortgaged for £4,500, and that the title is in the names of John Carter, D. G. Snodgrass, and George Forrest. The records of Mr. Carter & Co's banking account show that the deposit on the purchase of this property was paid with partnership money, and that the proceeds of the further mortgage were placed to the credit of the partnership account on 10/4/95.

(h) Following on Mr. George Forrest's statements in evidence regarding his New Zealand property, a letter was written from the Commission to the Town Clerk, Dunedin. To this a reply dated 25/7/96 was received, as follows:—

Town Clerk's Office, Dunedin, N.Z., 25th July, 1896.

B. Harry Friend, Esq., Secretary, Public Works Inquiry Commission, Chief Secretary's Office, Sydney, N.S.W.—

Sir,

I have the honor to acknowledge the receipt of your letter of the 2nd instant, making inquiry as to the property of Mr. George Forrest, in Macandrew Road and George-street, Dunedin.

In reply, I beg to inform you that, as Macandrew Road is in the suburban borough of South Dunedin, I have forwarded a copy of your letter to the Town Clerk thereof, and asked him to kindly reply to you direct.

There is no record in the city rate-books of any property owned by Mr. George Forrest, but as there is a possibility that he may be the owner of land which is leased for a term of years, which would cause the lessee's name only to appear in our books, I would suggest that further inquiry be made by you from the Commissioner of Taxes, Wellington, whose records for general taxation contain fuller details than the city books, and who would also supply particulars of any taxation charges upon the property. Information as to titles can best be furnished by the Lands Registry Office, which is also a Government Department.

I may mention that the description of the sections as being "at the corner of George-street and the main street in which the tramline runs" is slightly misleading, in that George-street is itself portion of the main route of the city tramway. I may also add that there is no vacant section at all in the portion of George-street through which the tramway is laid, and but three or four altogether in the remaining part of the street where there is no tramline.

I have, &c.,

WM. B. BAYLEY,  
Town Clerk.

It is stated in the above letter that the inquiry has been passed on to the Town Clerk, South Dunedin. From this latter official a reply dated 31/7/96 has been received: it is as follows:—

VALUATION of Mr. George Forrest's property in South Dunedin, New Zealand.

South Ward.

|   |       |
|---|-------|
| Section 12, Block X, containing 1 rood, situate in Macandrew Road, Borough of South Dunedin; on which is erected a 6-roomed dwelling house: valued at £325, made up as follows, viz.—land, £100; house, £225..... | £ 325 |
| Section 13, Block X, containing 1 rood, situate in Macandrew Road aforesaid, on which two houses, of three rooms each, are erected: valued at £200, made up as follows, viz.—land, £100; houses, £100.....        | 200   |

East Ward.

|   |      |
|---|------|
| Sub-division of Sections 1, 2, 3, 21, 22, 23, 24, 25, Block VI.—  |      |
| Allotment 4, situate in main street, South Dunedin, in name of Elizabeth Forrest, wife of the said George Forrest, containing 5·27 poles, vacant: valued at .....                                       | £ 20 |
| Allotments 24, 25, 26, George-street, South Dunedin, also in name of Elizabeth Forrest, on which are erected two 4-roomed cottages: valued at £245, made up as follows, viz.—land, £45; houses, £200... | 245  |

£790

South Dunedin, THOMAS R. DODDS,  
31st July, 1896. Valuator of the Borough of South Dunedin, under the Land and Income Tax Act.

The whole of the property in Mr. George Forrest's name, in Dunedin and South Dunedin, as disclosed in these letters, is—

|                                 |       |
|---------------------------------|-------|
| Block X of section 12 .....     | £ 325 |
| and Block X of section 13 ..... | 200   |
| Total.....                      | £525  |

(i) At the date when Mr. Forrest made his statutory declaration, there was to his credit with the Bank of New Zealand, Sydney, the sum of £310 3s. 4d., as shown by the accompanying statement furnished by the bank.

It would thus appear that on 1/6/95, when Mr. Forrest stated in his statutory declaration that he was "possessed of property to the value of £6,000 sterling and more, and that such property consisted of freehold property, £5,700, cash in Bank, £300 sterling," he was not possessed of the freehold property so declared, as the only freehold property in his sole control was that in South Dunedin, valued at £525.

(j) The following is an extract from Mr. Hickson's minute of 5/4/95, as it appears on page 209 of the Parliamentary Return:—

"Messrs. Carter and Gummow ask that their own 'personal sureties for the amount named,' i.e., £12,000 (an amount which they do not dispute), 'should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work.'

"They go on to say that they are 'a firm of sound financial standing, well and favourably known to the Department as contractors.' This is quite true; they are a firm in which I have every confidence. They have done a great deal of work under me, and I can testify that their aim always has been to turn out the very best class of work possible. At the same time, misfortunes happen the very soundest firms of contractors, and the Department must look a little way into the future. Their own bond for £12,000 would be really of no use if they were unfortunate enough in the meantime to become bankrupt."

"I think, therefore, it is right that the sureties should be insisted upon. They give the names of two men, Mr. George Forrest and Mr. James Gillan. From inquiries made, I believe these men to be financially sound; and I think if their names were accepted as the sureties in the penal sum of £6,000 each the Department would be secured as far as it is reasonably possible to be." G. Christie.  
21 Aug., 1896.

(k) Messrs. Carter and Co.'s and Messrs. Carter, Gummow, and Co.'s joint financial position at the period when this contract (No. 77) was entered into is dealt with in my memo. of 10/7/96, as it appears in printed evidence, page 232. It was at this period, namely, on 18/6/95, that Messrs. Carter, Gummow, and Co. borrowed the sum of £2,000 from Mr. S. H. Weedon.

(l) In the event of the works constructed on the Monier system under this contract having to be removed, and Messrs. Carter, Gummow, and Co. failing financially, the small amount of assets which Messrs. James Gillan and George Forrest have outside of the business would (if not absorbed in meeting the firm's engagements) be only very inadequate security for the fulfilment of their bond.

21/8/96.

GEO. C.

| Dr.     |                          | JAMES GILLAN, Esq., in account with the Bank of New Zealand, Sydney. |       | Cr.      |            |          |
|---------|--------------------------|--|-------|----------|------------|----------|
| 1895.   |                          | £  | s. d. | 1895.    | £ s. d.    |          |
| April 4 | To Daily Telegraph       | 1  | 0 0   | March 31 | By Balance | 74 3 6   |
| May 22  | Cash                     | 30   | 0 0   | April 8  | Cash       | 5 10 0   |
| June 12 | Town and Country Company | 1  | 5 0   | June 13  | "          | 5 10 0   |
| 30      | Balance                  | 52   | 18 6  |          |            |          |
|         |                          | £85  | 3 6   |          |            | £85 3 6  |
|         |                          |  |       | June 30  | By Balance | £52 18 6 |

Bank of New Zealand,  
Sydney, 30th June, 1896.

T. E. CORKILL,  
Assist. Accountant.

| Dr.     |            | GEORGE FORREST, Esq., in account with the Bank of New Zealand, Sydney. |       | Cr.      |            |           |
|---------|------------|--|-------|----------|------------|-----------|
| 1895.   |            | £  | s. d. | 1895.    | £ s. d.    |           |
| May 1   | To Forrest | 10   | 0 0   | March 31 | By Balance | 253 10 0  |
| " 21    | "          | 20   | 0 0   | April 3  | Cheque     | 43 6 8    |
| June 30 | Balance    | 353  | 10 0  | May 3    | "          | 43 6 8    |
|         |            | £383   | 10 0  | June 6   | "          | 43 6 8    |
|         |            |  |       |          |            | £383 10 0 |
|         |            |  |       | June 30  | By Balance | £353 10 0 |

Bank of New Zealand,  
Sydney, 30th June, 1896.

T. E. CORKILL,  
Assist. Accountant.

13876. The papers submitted to Parliament show, do they not, that the declarations of the two sureties were taken some time after they had signed the bond? Yes; the two declarations are here. The bond appears to have been completed on the 16th May. The declaration taken in the case of Mr. Forrest is on the 1st June following, and in the case of Mr. Gillan on the 27th May following.

13877. Was the bond in the case of Mr. Gillan's surety originally in the handwriting of Mr. Carter? The form of declaration, other than the printed matter, is filled in by a clerk. Then Mr. Carter's writing is as follows:—"Cash at bankers; freehold and other property." The declaration was made before Mr. Norrie.

13878. It is not filled in with the handwriting of Mr. Gillan? No.

13879. Upon page 305 of the Parliamentary Return there is a document relating to the substitution of blasting for guttering and gadding, and on pages 317 and 318 there are further papers dealing with the same matter;—you have prepared the report, from which it appears that a clear advantage was given to the contractors by this substitution? Yes; it is as follows:—

## MEMO No. 20.

STATEMENT of the gain to Messrs. Carter & Co. consequent upon the rearrangement and substitution of schedule items, Contract No. 79.

(a) Reference is made to my memo. No. , given in evidence 22/7/96 (page 297), and to Messrs. M'Creddie and Thompson's report in evidence 24/7/96 (page 306). The total amount of benefit to the contractors as per that report of Messrs. M'Creddie and Thompson is as follows:—

| Schedule Item—       | £      | s. | d. |
|----------------------|--------|----|----|
| No. 1                | 545    | 2  | 11 |
| 5                    | 90     | 5  | 0  |
| 10 to 15 (inclusive) | 235    | 10 | 10 |
| 17                   | 319    | 11 | 3  |
| 20                   | 360    | 0  | 0  |
| 4                    | 1,680  | 7  | 5  |
| Total                | £3,230 | 17 | 5  |

[Mr. Davis objected to Mr. Christie's reading his memorandum dealing with Messrs. M'Creddie and Thompson's report of 24/7/96, upon the ground that he considered that it was based upon a false assumption.]

Mr. Christie.] In preparing evidence for the Commission I have been very careful not to submit anything that would tend in anyway to mislead, and I have in this case gone carefully into Messrs. M'Creddie and Thompson's evidence and the Commissioner's examination thereon. There is only one item in which the schedule of 79a was referred to, and that is a fair comparison.

[His Honor said he would allow the memo. to go in as evidence, but he would at the same time direct that a note be taken of Mr. Davis' objection.]

[Mr.

G. Christie.  
21 Aug., 1896.

*Mr. Christie.*] The following papers have reference to this matter :—

- 92/1,123.—Minute—Supervising-Engineer Davis to Engineer-in-Chief, 19/5/92. *Re* driving tunnels.  
Letter—Supervising-Engineer Davis to Carter & Co., 27/5/92. *Re* driving tunnels.  
92/1,216.—Letter—Carter & Co. to Supervising-Engineer Davis, 2/6/92. Accepting terms of letter (No. 24).  
93/1,050.—Letter—Carter & Co. to Supervising-Engineer Davis, 10/8/93. Asking for increased cross-sections.  
93/1,074.—Minute—Supervising-Engineer Davis to Engineer-in-Chief, 14/8/93. *Re* increased cross-sections.  
Letter—Supervising-Engineer Davis to Carter & Co., 21/8/93. Granting additional measurement.  
93/1,175.—Letter—Carter & Co. to Supervising-Engineer Davis, 28/8/93. Accepting same.

Sydney, 21/8/96.

GEO. C.

The papers are as follows :—

Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.

*Minute Paper.*

*Subject* :—Contract No. 79—North Sydney Outfall Sewer.—Driving of Tunnels.

Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 19 May, 1892.

THE tunnels from some of the shafts on this contract will be commenced in a few days, and it is, therefore, necessary that it should be settled how they are to be driven, whether with 4-inch charges of compressed powder, 2-inch charges, or without blasting.

With a view of arriving at the method which would give the least annoyance to the residents in the vicinity of the sewer, consistent with economy, I have made comparative estimates.

The excavation by "guttering and gadding" will cost 3s. per cubic yard more than with 4-inch charges of compressed powder, but, as it is impossible to drive the tunnel by blasting to the exact size desired, considerably more concrete has to be used in lining when the driving is done by blasting than when done by "guttering and gadding;" and, taking this into consideration, I estimate it will cost about £1,250 less to do the tunnels without blasting compared with doing it with 4 inches of powder.

The 2-inch charges, with the extra supervision that would be required, would be the most costly of any.

I wish, however, to point out that while it would save annoyance and money to drive the tunnels without explosives, it would take longer to do the work.

J. DAVIS.

Messrs. Carter & Co. have undoubtedly fixed their schedule prices speculatively to increase their profits on the contract as much as possible, and, if so, to the loss of the Department. Mr. Davis seems, therefore, justified in the suggestions made, as they would likely cause a saving of £1,000, and clause 55 of the specification is, no doubt a saving clause against speculative prices.—C. H. OHLFSEN BAGGE, 19/5/92. The Engineer-in-Chief.

Ask contractors to see me on Thursday morning.—R.H., 23/5/92. Messrs. Carter & Co., 23/5/92.

While I think the Department would hardly be justified in adopting this unusual method of carrying out the work, it is very clear we should aim at getting our work done as economically as possible. Blasting may, therefore, be allowed on the understanding that the average allowance of 4 inches for concrete packing over and above specified size of tunnels be reduced to 2 inches.—R.H., 26/5/92. Mr. Davis.

Contractors informed. Copy of letter attached.—J.D., 27/5/92.

Supervising-Engineer Davis to Messrs. Carter & Co.

Gentlemen,

42, Elizabeth-street, 27 May, 1893.

Referring to the conversation which your Messrs. Carter and Snodgrass had with the Engineer-in-Chief respecting the mode of driving the tunnels in your sewerage contract No 79, and to your verbal agreement that on condition you were allowed to do the tunnel excavation under item No. 3 of the schedule of prices, by blasting with 4-inch charges of compressed powder, you would not ask to be paid for more than 7 inches of lining, such 7 inches to include the 5-inch thickness of cement rendering, I am directed to inform you that the Engineer-in-Chief has approved of the above agreement, without prejudice to his right, under clause 55 of the specification, to order the excavation to be taken out otherwise should he deem it necessary to do so.

The cross-sections will be taken in the usual manner, and you will be paid for the excavation ordered, and for a maximum of 2 inches of concrete lining in excess of the excavation ordered.

Would you kindly write, intimating your acceptance of this arrangement.

Yours, &c.,  
J. DAVIS.

Messrs. Carter & Co. to Supervising-Engineer Davis.

Contract No. 79, North Sydney Outfall Sewer.

Sir,

Box No. 10, North Sydney Post Office, 2 June, 1892.

In reply to your letter of the 27th May, we hereby agree to accept the terms of the same, viz. :—That the excavation (tunnel) on the above contract shall be carried out under item No. 3 in the schedule of prices, and that the lining shall be paid for to a maximum thickness of 2 inches over plan dimension, making a total thickness of 7½ inches instead of 7 inches as set down in your letter.

We are, &c.,  
CARTER & CO.

This is according to contract drawings.—J.D., 6/6/92.

Messrs. Carter & Co. to Supervising-Engineer Davis.

Sir,

Box No. 10, North Sydney, 10 August, 1893.

Referring to our letter of 2nd June, 1893, in which we accept a maximum thickness of 2 inches over plan dimension as the quantity to be paid for lining tunnel on Contract No. 79, North Sydney sewerage, we beg to state that this was agreed to on the supposition that the ground would admit of such dimension being practicable.

In this contract, as in some others of a similar character, notably Contract No. 53, Waverley sewerage, the ground met with is of such a nature as to render it impossible to keep within the usual limits.

The 2 inches referred to was fixed as being 2 inches less than usually works out as an average cross-section, but owing to the foregoing reason, and to unavoidable errors in the alignment, we ask to be allowed cross-sections equal to those of Contract No. 53, less the 2 inches which was intended to be deducted.

We are, &c.,  
CARTER & CO.

Register and connect papers.—J.D., 9/8/93. Previous papers 92/1,216 herewith.—F.C.P., 10/8/93.

Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.

*Minute Paper.*

*Subject* :—North Sydney Outfall Sewer, Contract No. 79—Contractors write asking that the question of thickness of lining in tunnel should be reconsidered.

Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 14 August, 1893.

IN June of last year, at the time the tunnelling was commenced on this contract, the contractors undertook, if they were allowed to do the excavation under item No. 3 of the schedule of prices, they would not require payment for more than 7½ inches lining, or a margin of 2 inches over the cross-sections of the tunnel excavation ordered. The

The tunnel excavation is nearly finished, and the first length of about 18 chains of lining is in progress. The contractors now write asking that the question of the thickness of the lining to be paid for should be reconsidered.

They allege that the ground met with in the tunnels was of an exceptional nature, and similar to that on the Waverley and Woollahra branch sewer (Contract No. 53), and they therefore desire that they be allowed cross-sections equal to those paid for on that contract, less 2 inches.

The rock in the tunnels at Waverley and North Shore is certainly alike, and a number of "floors" and "faces" were met with at both places which materially increased the area of the tunnels. The cross-sections, as a consequence, were unusually large at Waverley, the average margin of the lining over the excavation ordered being about  $5\frac{1}{4}$  inches. Difficulties of the same nature have been experienced at North Shore, and the cross-sections are likely to work out equally as large as the Waverley ones.

The papers show that when the agreement was made it was thought that there would be no exceptional difficulties to be encountered in the driving, and that the lining would not exceed the cross-section of excavation by more than 4 inches. On this understanding Messrs. Carter & Co. offered to forego 2 inches of the lining if they were allowed to do the excavation as they desired. The question now arises whether (seeing that the rock has proved to be similar to Waverley) they should have the agreement modified so as to be paid on the basis of that contract.

It was evidently the intention of the Engineer-in-Chief for the contractor to bear the expense of 2 inches of lining, and the contractors ask that by regarding Waverley and North Shore as parallel cases this should be done.

I therefore beg to recommend that the 2 inches to margin of tunnel-lining be increased to  $3\frac{1}{4}$  inches in thickness.

J. DAVIS.

For the consideration of the Engineer-in-Chief.—C. H. OHLFSEN-BAGGE, 15/8/93. Messrs. Carter & Co. informed.—J.D., 21/8/93.

The 2 inches was decided upon on the assumption that the average allowance for concrete-packing was 4 inches. As it is now stated this really works out at  $5\frac{1}{4}$  inches, Mr. Davis's suggestion is only fair and equitable, and may therefore be adopted.—R.H., 15/8/93.

Supervising-Engineer Davis to Messrs. Carter & Co.

Gentlemen,

Department of Public Works, Sydney, 21 August, 1893.

I have to acknowledge the receipt of yours of the 10th instant, stating the nature of the ground through which the tunnels have passed is not what it was anticipated, and that therefore the maximum thickness of 2 inches over the cross-section ordered for the excavation (see my letter 27th May, 1892) is not sufficient, and asking that, as the nature of the rock is similar to that passed through in the tunnels of the Waverley and Woollahra branch sewer, the case be regarded as parallel, and that you be allowed the cross-sections equal to those on that contract less 2 inches.

In reply, I have to inform you that the Engineer-in-Chief has decided, on account of the nature of the rock, to modify the agreement, contained in my letter of 27th May, 1892, to the extent of increasing the margin of 2 inches thickness of lining, over the cross-section of excavation ordered, to a maximum of  $3\frac{1}{4}$  inches. Otherwise the terms of the letter to remain unaltered.

It is also to be understood that this additional allowance in the lining is to cover the cost of any extra concrete which will be required through unavoidable errors in the levels and alignments of the tunnels, including those between shafts Nos. 3 and 4.

Will you please accept this modification of the agreement previously made respecting the lining of the tunnels, in writing.

I have, &c.,

J. DAVIS,

Supervising Engineer.

Messrs. Carter & Co. to Supervising-Engineer Davis.

Sir,

Alfred-street, North Sydney, 28 August, 1893.

We have the honor to acknowledge your letter of 21st August *re* maximum of lining to be allowed in tunnels on Contract No. 79, North Sydney Sewerage, and to inform you that we agree to accept the same according to the terms of your letter.

We have, &c.,

CARTER & CO.

Please put with other papers.—J.D., 30/8/93.

13880. With reference to the advances on cement, which are made on a sort of bill of sale, is there, in the Parliamentary papers, or in any of the papers before the Commission, any minute showing that these transactions received Ministerial approval? I have not been able to discover any.

13881. Will you see what these papers contain? They are agreements under which certain advances were made to the contractors in respect to Contracts 79, 79a, and 69.

13882. Are these the agreements referred to in your previous report, when you said they were a risk to the Government? Yes; they have been referred to in one of my previous reports.

13883. They have received no Ministerial sanction? I have searched through the papers to see if there was any such sanction, but I have not succeeded in finding any. As far as I can see, the highest authority is that of Mr. Hickson.

13884. Will you read the letters which you referred to in Messrs. Carter, Gummow, & Co.'s memo. of 15/7/96, which appears upon page 255 of the Parliamentary Return? These are the documents referred to. I may explain, with reference to one of them, that there is an inaccuracy in the date—the figures "12" are apparently wrong. I ought to explain that there are the following pencil memoranda which do not appear in the printed paper No. 3 in the Parliamentary Return, they having evidently been ignored by the printer. "Will Mr. Mitchell see me with tender papers, 30/12/91." That, I understand, is in Mr. M'Lachlan's handwriting. Then there is this minute, "Will Mr. Hickson kindly see me about this at his convenience, 13/6/91." The next one is "Three contracts submitted.—F.C.P., 14/7/91" Then they are resubmitted on 27/7/91. Finally there is this minute, "The question of funds not yet decided; to be held over for one month." I ought to explain that the words "for one month" are somewhat doubtful. It is rather difficult to decipher the pencil-marks. The date in paper No. 4 should be 7/9/91.

ORIGINAL Papers in connection with Contract 79, referred to in memo. given in evidence on 15th July (page 255).

91/1,524.—List of tenders received for Contract 79.

91/1,523.—Letter—Carter & Co., and Gummow & Co., to President of Tender Board, 10/6/91, protesting against acceptance of Bond and Hudson's tender.

91/1,991.—Letter—E. M. Clark, M.P., to Minister for Works, 30/7/91, urging that the work be proceeded with.

91/2,099.—Letter—Same to same, 18/8/91, again urging that work be proceeded with.

91/2,373.—Letter—Bond and Hudson to Minister for Works, 28/9/91, withdrawing tender.

92/118.—Minute—*Précis* of case up to withdrawal of Bond and Hudson's tender, 29/1/92.

Minute—Chief Clerk to Tender Board, 23/2/92—withdraw notice inviting fresh tenders.

91/2,373.—Letter—Under Secretary to Carter & Co, 10/3/92, notifying acceptance of their tender.

G.C., 21/8/96.

The

G. Christie.  
21 Aug., 1896.

The papers are as follows :—

Schedule of Tenders received by Tender Board.

Wednesday, 10 June, 1891.

LIST of Tenders received for construction of the North Shore Main Outfall Sewer, from near Long Bay to Mount-street.

|                                  |  |
|----------------------------------|--|
| Number of tenders received ..... | Seven.   |
| Estimated amount .....           | £43,494 10s. 6d.   |
| Amount of lowest tender .....    | £36,900.   |
| Name of lowest tenderer .....    | Messrs. Bond and Hudson.   |
| Vote .....                       | Balance of £107,000, North Shore Drainage.<br>53 Vic. No. 23.      |
|                                  | Amount.                      Deposit.                      Nature. |
| 1. Bond and Hudson.....          | £36,900 0 0                      £369                      Cheque. |
| 2. Carter & Co. ....             | 39,890 0 0                      400                      "         |
| 3. Gummow & Gillan.....          | 40,840 0 0                      410                      "         |
| 4. D. Sheehy .....               | 45,980 18 8                      500                      "        |
| 5. J. McSweeney .....            | 48,146 12 4                      480                      "        |
| 6. Lemm and Spencer.....         | 56,563 10 0                      500                      "        |
| 7. Jno. Taylor & Co. ....        | 58,011 0 0                      500                      "         |

D. C. M'LACHLAN, 10/6/91.

I recommend acceptance of Bond and Hudson's tender at schedule rates.—R.H., 10/6/91. Under Secretary.  
J. BARLING, Vice-President of Tender Board.

Messrs. Carter & Co. and Messrs. Gummow and Gillan to the President of Tender Board.

Sir,

Sydney, 10 June, 1891.

We have the honor to enter our protests against the acceptance of the tender of Messrs. Bond and Hudson for Contract No. 79, North Shore sewerage, on the following grounds :—

1. That the tender of Messrs. Bond and Hudson for Contract No. 56, Potts' Point sewerage, was accepted by your Board and not taken up by them.
2. Upon fresh tenders being called, the tender of Mr. G. E. Hudson was the lowest, but was not accepted by the Board, in accordance with their Rules and Regulations.

Upon these grounds we, as tenderers for the North Shore sewerage, beg to protest against the tender of Messrs. Bond and Hudson being now accepted.

We have, &c.,

GUMMOW AND GILLAN.

CARTER & CO.

Herewith.—J.C.P., 10/6/91.

Let me have papers *re* Bond and Hudson's tender for Contract 56.—R.H., 10/6/91.

Mr. Hickson for report.—J.B., 10/6/91.

In January, 1890, C. S. Bond (afterwards Bond and Hudson) tendered for Sewerage Contract No. 56 at a ridiculously low figure, and, as anticipated, had to throw up the contract and forfeit deposit. They were the lowest again when fresh tenders were invited, but did not get the work, they being ineligible under the Tender Board Regulations, clause 14. The same firm now (some sixteen months later) are the lowest tenderers for Sewerage Contract 79, and it is contended by the writers of the within letter that their tender should not be accepted. I cannot recommend that this course be taken. It is true, under clause 14, they can be excluded from competing for other works at the pleasure of the President; but in all fairness there must be some limit (when no fraudulent action has taken place) to this prohibition; and it seems to me, after sixteen months, all bar to their tendering should be removed. See recommendation on face of tender.—R.H., 10/6/91. Under Sec.

Will Mr. Hickson kindly see me about this at his convenience.—J.B., 13/6/91.

Re-submit with the other tenders held in abeyance.—J.B., 10/7/91. Contracts submitted.—F.C.P., 14/7/91.

Re-submitted.—27/7/91. Question of funds not yet decided. To be held over for ten days more.

Re-submit when we deal with the tender.—J.B., 30/12/91.

Mr. Mitchell see me with the tender papers.—30/12/91.

E. M. Clark, Esq., M.P., to the Secretary for Public Works.

Sir,

Parliament House, Sydney, 30 July, 1891.

I understand that tenders were accepted some time ago for the outfall sewerage to Long Bay, St. Leonards. The successful contractors were, I understand, Messrs. Bond and Hudson; and, as the work is a very urgent one, I think they should be compelled to go on with the work.

Trusting you will hurry the matter on.

I have, &c.,

EDWARD M. CLARK.

Resubmit with the tender, which I do not think has been accepted.—J.B., 3/8/91. Tenders for Contract No. 79 (91-1524) and all previous papers submitted, 13/7/91.—R.H., 3/8/91. All papers herewith.—D.C.M'L., 4/8/91. To stand over.—J.B., 7/9/91. Roads, B.C. Seen.—R.H., 8/9/91.

E. M. Clark, Esq., M.P., to the Secretary for Public Works.

Sir,

Parliament House, Sydney, 18 August, 1891.

I shall be glad to know how far the matter of proceeding with the "outfall sewer to Middle Harbour," in my electorate has progressed.

I might say I wrote you on the matter a fortnight ago.

Yours, &c.,

EDWARD M. CLARK.

91/1,991, and all previous papers, sent Under Secretary, 4/8/91. Tenders are awaiting acceptance; amount, £36,900, loan.—J.B., 19/8/91. Submitted.—J.D., 19/8/91. Inform must stand over until the question of further loan expenditure has been determined.—B.S., 21/8/91. Inform to-day.—J.B., 21/8/91. E.M. Clark, Esq., M.P., 21/8/91. Seen.—R.H., 24/8/91.

Messrs. Bond and Hudson to the Secretary for Public Works.

*In re* Contract No. 79, Sydney Sewerage Works.

Dear Sir,

88, Sussex-street, Sydney, 28 September, 1891.

On 10th June, of this year, we had the pleasure of submitting a tender for the above works, and, we believe, were successful in being the lowest tenderers.

We have been anticipating the acceptance of our tender for some months, but, not hearing from your Department, we have, in the meantime, entered upon other obligations, and must consequently respectfully ask you to permit us to withdraw our tender, and to return us the deposit attached thereto now lying in your hands, viz., £369.

We are, &c.,

C. B. BOND

(BOND AND HUDSON).

How does this matter stand?—D.C.M'L., 30/9/91. Messrs. Bond and Hudson's tender was recommended for acceptance on 10/6/91. Papers herewith.—F.C.P., 1/10/91. Return deposit.—J.B., 2/10/91. Accountant to return deposit, 2/10/91. I recommend that fresh tenders be invited.—R.H., 6/10/91. Under Secretary. Submitted.—J.B., 9/10/91. Approved.—W.J.L., 22/2/92. Insert notice, 22/2/92. Notice to *Gazette*, 22/2/92. Tenders for 9th March, 1892.

Since writing my minute of 6/10/91, complications have arisen with Carter & Co., *re* their Contract No. 72 having been stopped. They have made large claims on this account, some of which no doubt could not be entertained, but on some items they have made a good case. They are prepared, if they obtained this work, to waive all claims on No. 72. As their tender is a reasonable one, and some £3,600 below the estimate, I think it might fairly be accepted. If this course were adopted, work would be given at once to a large number of men.—R.H., 23/2/92. Under Secretary. Important.

As Mr. Hickson thinks Messrs. Carter & Co. could make good a claim for something like £2,000 as compensation on Contract 72 (Moni-street, partly), should they be willing to forego this claim, their tender may be accepted for construction of the main outfall sewer, North Sydney—£39,890, as worked out at schedule rates. If this firm will not agree to the condition imposed, fresh tenders to be invited.—W.J.L., 23/2/92.

Mr. Hickson.—D.C.M'L., for U.S., B.C., 23/2/92. Please see me with Messrs. Carter & Co.—J.B., 23/2/92. Mr. Hickson.

*Précis*

*Précis* of case up to return of Messrs. Bond and Hudson's deposit.  
Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 29 January, 1892.

G. Christie,  
21 Aug., 1896.

*Minute Paper.*

*Subject*:—North Shore Outfall Sewer, Contract No. 79, Sydney Sewerage Works.

TENDERS were received on the 10th June, 1891, for this work, that of Messrs. Bond and Hudson, at £37,254 10s., being the lowest. On the same date Messrs. Carter & Co. and Messrs. Gummow and Gillan conjointly wrote in protesting against the acceptance of Bond and Hudson's tender, as that firm had, on a previous occasion, thrown up a contract; but the protest was not allowed on account of the lapse of time, and as no fraudulent action had taken place; their tender was therefore recommended for acceptance.

On 28th September, 1891, Messrs. Bond and Hudson wrote in asking for the return of their deposit, and to be allowed to withdraw their tender, owing to the delay in acceptance of same, and their having entered into other large engagements.

The deposit was returned accordingly on the 7th October, 1891.  
The Engineer-in-Chief for Sewerage.

F.E.P., 29/1/92.

Seen.—R.H., 1/2/92. File.—R.H., 10/3/92.

The Chief Clerk to The Tender Board Clerk.

Department of Public Works, Sydney, 23 February, 1892.

*Minute Paper.*

*Subject*:—Main Outfall Sewer, North Sydney.

WITHDRAW notice inviting tenders for the above.

Done, 23/2/92. Put with the papers, 25/2/92.

The Under Secretary for Public Works to Messrs. Carter & Co.

Sirs,

Department of Public Works, Sydney, 10 March, 1892.

I have the honor, by direction of the Secretary for Public Works, to inform you that your tender, dated 10th June last, is accepted for construction of the North Shore Main Outfall Sewer, from near Long Bay to Mount-street—Contract No. 79, Sydney Sewerage—at your schedule of prices.

The work is to be carried out in strict accordance with the several contract exhibits relating to this contract, and to be completed within twenty-four months from this date.

I have to refer you to the Commissioner for Roads for further information, and to request that you will call upon the officer in charge of Bonds and Contracts at this office, for the purpose of executing the necessary documents for the due observance of your contract.

I am, &c.

J. BURLING,

Under Secretary.

13885. As to the retention money upon Contract No. 72; in that case, as in the other contracts, the Parliamentary papers show that some portion of it was returned? Yes.

13886. In what position did the return of this money leave the Government? Upon certificate No. 9 of 20/1/92, £930 was returned; upon certificate No. 11 of 9/6/92 a further sum of £500 was returned; and upon certificate No. 15 of 23/9/92 a further sum of £330 was returned.

13887. Up to the time when the temporary stoppage of the works took place on Contract No. 72 what was the money held in hand? Upon the certificate prior to the return of any money there were £1,804 in hand.

Joseph Barling recalled and further examined:—

13888. *Mr. Parkes.*] As to Contract No. 79, which was let upon the 10th March, 1892; that contract was let, evidently after some considerable delay, to Messrs. Carter, Gummow, and Co., the former successful tenderers, Messrs. Bond and Hudson, having withdrawn their tender;—do you remember what actually took place in regard to the negotiations at that time? The only thing I know about it, as far as my recollection will serve me, is the receipt of a letter on the 28th September, 1891, which appears upon page 270 of the Parliamentary return, and which is in these terms:—

J. Barling,  
21 Aug., 1896.

Dear Sir,—On 10th June of this year we had the pleasure of submitting a tender for the above works, and, we believe, were successful in being the lowest tenderers. We have been anticipating the acceptance of our tender for some months, but not hearing from your Department, we have in the meantime entered upon other obligations, and must consequently respectfully ask you to permit us to withdraw our tender, and to return to us the deposit attached thereto now lying in your hands, namely, £369.

We are, &c.,

C. B. BOND

(Bond and Hudson).

That was at once acceded to. I would first draw attention to the fact that this tender was received on the 10th June, and on the 2nd October, nearly four months after its receipt, the deposit was returned. The reason the work was kept over was the extreme financial difficulty the Colony was undergoing. Our loan money was practically exhausted, and the proceeds of the loan which had been floated had been hypothecated. The whole thing is a matter of history, but I may refer you to the speech made at the time by Sir George Dibbs, who had then taken up the Government. You will find it recorded in *Hansard* of the 8th December, 1891, page 3413, as follows:—"I will read to the House a few items from the document laid upon the Table this afternoon by the Colonial Treasurer. Honorable Members will then see whether it will take three or four years to cover this amount of £4,208,000. We have not a farthing to our credit here, nor have we a farthing to our credit in England; and there will have to be a balance to our credit in both places on 1st January. With a liability of £4,000,000, in addition to a deficit of £600,000 in the Consolidated Revenue Account, we have to face a very great difficulty." That will serve to show you the financial difficulties the Colony was then undergoing. Previous to the date of the return of this deposit a somewhat similar difficulty had occurred. A gentleman named Frogley, who had put in a tender for some work—it is not important at the present moment what it was—wrote a letter from Wickham, under date 20th June, 1890, in which he complained of the long time which had been occupied in settling the matter of his tender. With reference to his preliminary deposit, he said he did not like to withdraw it, because he was afraid that that might jeopardise his tender. I wrote upon that: "This is quite a mistake, for if he had written he would have got his deposit without injury to his chance of getting the contract. Perhaps, however, it would be as well to make a rule, that in the event of any tender not being accepted within a month, all deposits shall be returned." That rule was acted upon. When application was made

J. Barling.  
21 Aug., 1896.

made for the return of the deposit in the case referred to, as the Government were not ready to accept the tender, not having the money with which to do so, the deposit, under that Ministerial rule, was returned. The matter was at once submitted to the Minister, Mr. Young, and he could not deal with it on account of the financial difficulty. When Mr. Young left office the papers were returned to me, and were not dealt with for the reasons I have stated until the 22nd January, 1892, when Mr. Lyne approved of fresh tenders being called. That is to say, that, dating from the time of the receipt of the tender, the Government were not ready to deal with the tenders for a period of nearly eight months.

13889. The Department did not send to Bond & Hudson to see if it could induce them to abide by their tender, although they had had their deposit returned? I do not exactly remember now what was done, but the main thing is this—that the Government were not ready to deal with the matter.

13890. Do you know that Mr. Hudson made repeated application to your officers to know whether the Department were going on with the contract? I should think that that would probably be so, although I do not remember seeing him myself. I may have done so, but I do not think I did.

13891. Were the matters in connection with Contract No. 72 put before you? I saw the claim, but it was not decided. I did not go into the matter at all.

13892. What conversation did Mr. Hickson have with you about it? I do not think he had any conversation with me about it at all—at least I do not remember any. The facts of the case are these, as far as I can remember them. Mr. Lyne directed that tenders be called, and we took action upon the matter. What took place then I cannot tell, but I believe, as far as I know, that it was this—that Mr. Lyne sent to Mr. Hickson, and had a conversation with him which led to the acceptance of Carter, Gummow, & Co.'s tender. That was the result of an interview which took place between Mr. Lyne and Mr. Hickson, at which I was not present.

13893. Do you know the effect of it? What I remember is that Mr. Hickson sent down a paper which he noted "important," embodying, as I took it, the result of his conversation. The paper merely came through my hands to be sent on to the Minister, committing to writing the arrangement which Mr. Hickson and Mr. Lyne had come to in the matter. [*Vide Appendix No. 79.*]

13894. That would be the paper dated 23/2/92? Yes.

13895. Did Mr. Lyne send for Mr. Hickson? I understand Mr. Hickson to say that he did, although I cannot speak positively upon that point. He did not go with my knowledge; and, except in the way I have described, I had nothing to do with the matter.

13896. Do you know whether Mr. Hickson's minute of 23/2/92 was written before Mr. Lyne's minute of the same date? No, I think not. What I understand to have taken place was this—of course Mr. Hickson can correct me if I am wrong—after Mr. Hickson had seen the Minister he went upstairs immediately and wrote that minute, which was sent in by me to the Minister as being the result of the interview which had taken place between himself and Mr. Hickson.

13897. The Minister then wrote this further minute of 23/2/92? Yes.

13898. But I presume you would not have agreed to Messrs. Carter & Co. having this contract without tender had you known that Bond & Hudson were willing to take it up? Certainly not. Most certainly not—it would have been a wrong thing to do.

13899. If you had known at that time that Bond & Hudson had been bought off by Messrs. Carter, Gummow, & Co., would you have accepted Messrs. Carter, Gummow, & Co.'s tender? I should say most certainly not.

13900. Is not the system of re-tendering generally adopted? It is often done, but it is very often not done, because, when there is no suspicion of any collusion, it is thought fair to the second tenderer—if his tender be below the office estimate—to give him a chance of doing the work. It is thought an unfair thing to a contractor, after his price has been exposed, and after he has gone to a large expense in preparing a tender, to throw him aside just simply on account of a mistake which the first tenderer may have made. I quite admit that it is a system which deserves the very greatest care in its administration. Only in cases where there is no suspicion of collusion, and where the tenderer is below the office estimate, should the work be given to the second tenderer. A good many instances could be shown where it has been done.

13901. Supposing there is no more than one tenderer below the office estimate? You would naturally take the second tenderer.

13902. But have they not all a right to a fair show? I should hardly think that No. 3 could urge a claim as against No. 2 any more than No. 4 could urge a claim as against No. 3, and so on. The matter is one which is always decided by the Minister, but I admit that in dealing with anything of the kind the greatest caution should be exercised.

13903. What would there be to prevent contractors from setting up bogus contractors, and from buying one another off? The system requires the utmost care, there is no doubt about that.

13904. Where does the unfairness come in to the second tenderer if his tender is not accepted? Suppose the first tender is a perfectly bogus one—a tender which showed that the contractor had taken no care at all in the matter, that it was a mere speculative tender, that it was really not a serious offer—it would seem rather unfair, in such a case, to throw out the second tenderer; but, as I say, the matter is left to the option of the Minister. I am sorry to see from the papers that in this case there has apparently been collusion; but the office was in absolute ignorance of it.

13905. The minute which has been referred to under date of 30/12/91, was considerably after Messrs. Bond & Hudson had withdrawn their tender? Yes.

13906. [*His Honor.*] Will you look at page 270 of the Parliamentary return;—you will see there a minute by yourself, under date 30/12/91: "Re-submit when you deal with the tenders." The question is how that comes to be so long after the former dates given? That seems to be a little bit out of its place there; the minute is easily explained. I was well aware that we were not able to deal with the tenders on account of the financial difficulties of the Government.

13907. That paper must have come before you again on the 12th? It may have done so; I cannot remember, it is so long ago. When you recollect that this happened five years ago, it is not very much to be wondered at that I should not remember an incident of that kind.

13908. [*Mr. Parkes.*] Would it not have been a fair thing to re-tender this contract when there was a difference of nearly £3,000 between Bond & Hudson and the next tenderer? I submitted it for fresh tenders to be called and the Minister approved of that being done, and it was only when these other considerations, with which I had nothing to do, came in that another course was taken. 13909.



13909. Was it your belief as Under Secretary that fresh tenders should be called? Speaking for myself, I would rather have seen fresh tenders called, but I can quite understand that if a claim were submitted for delay in the carrying out of Contract No. 72 it may have been the wisest thing to accept the tender of Carter, Gummow, & Co. In the other case, however, as I explained, I was not present when that was arranged. J. Barling.  
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13910. Supposing the claim in connection with Contract No. 72 were untenable? Then I most certainly think that a better way would have been to call for tenders. [*Vide Appendix* No. 33.]

13911. You said that that claim was never put before you? I think I said that I had seen it, but that I had never dealt with it.

13912. Did you have any discussion about the matter at all? I do not remember it.

13913. The claim was simply shown you? I remember seeing the paper, and I suppose it must have passed through my hands.

13914. Did you form any opinion upon the claim? No; it naturally would go to Mr. Hickson.

13915. Did it go to Mr. Young? I cannot say, but the papers will show whether it did or not.

13916. Do you know when Mr. Young left office? On the 22nd October, 1891. He had only held office then a very short time.

13917. Do you recollect whether the matter went before Mr. Lyne? That I cannot remember. I do not think it was ever reported upon by Mr. Hickson to me, but he evidently must have discussed the whole matter with Mr. Lyne at that interview, because it is referred to in Mr. Lyne's minute. I was not present at the interview, however, and I cannot say what was said. I may be mistaken in the dates, because I am speaking entirely from memory.

13918. With regard to Contract 77, and the substitution of the Monier arches, had you anything to do with the sureties? I think I explained that I had nothing to do with the sureties, except that it was reported to me by Mr. Hickson or Mr. Darley that they were sufficient sureties.

13919. Do you recollect what took place in connection with the letting of Contract No. 72? I cannot say that I have a clear recollection of the contract, except, as far as I remember, that there was power taken in the specification to omit or delay certain portions of the work.

13920. Do you know why? On account of there not being sufficient funds, I think.

13921. Do you recollect whether the contract exceeded the funds at your disposal by £5,000? I do not remember the amount, but I believe the funds we had were not sufficient.

13922. When the contractors took up the contract, you understood that you were to expend only the vote? I do not know that. I think, as I have said, that there was an understanding that if there was not sufficient money we could cut out the lower portion of the work. Instead, however, of cutting out the lower portion, we cut out, for the time being, the first portion.

13923. Did you not give the contractors extra work? I do not remember the case sufficiently to answer that question.

13924. Was that contract submitted to you before it was signed? No; the work is not done in that way. I should not go into the details of the matter at all. As I explained before, the Works Department has to deal with from 3,000 to 4,000 contracts annually—in railway construction, in the construction of public buildings, in the erection of wharfs and docks, and many other works quite apart from sewerage contracts. No one man could possibly take in the details of the whole of those contracts. The Under Secretary of the Public Works Department, in dealing with works of this sort, is not like the head of a private office, where everything sometimes goes through the hands of one person. We are dealing in this case with a great office of State, and it would be impossible for any one man, even if he were an engineer, to go into all the details.

13925. But you would have to go into the question of finances? Undoubtedly I should see that the contract was not let if we had not sufficient funds for it.

13926. You would see that it would not exceed a given amount without provision being made? I should see that in the acceptance of the tender we would not overrun the amount, but I have nothing to do with the matter afterwards. The papers would not come through my hands. I am not the accounting officer for payments on account of contracts. I submit the tenders to the Minister, and it is my business to see that we do not enter into obligations which we have not the money to fulfil. When it comes to the carrying out of the contract I have nothing to do with that. That is left to the heads of the engineering branches.

13927. Did you see that there was provision in this particular case? It was probably reported to me that arrangements had been made by which the Government would have to cut out certain portions of the work in order that the funds at our disposal might not be exceeded. Unless a legal question arose, I do not suppose I should see the plans and specifications.

13928. I suppose you would instruct your officers to make provision for the contract? In submitting the matter to the Minister, I should so submit it that he would not be committed to an expenditure for which funds had not been provided. That is the full extent to which I should go.

13929. As to the letting of Contract 79a, we do not appear to have any papers relating to that matter beyond the letter of Mr. Clark asking that the work might be proceeded with on account of the want for work in the district;—there must be further papers in connection with the matter? Not that I am aware of. If there are further papers they are unknown to me. As I explained before, with reference to the papers put before Parliament, it was impossible for me to have gone into the matter personally, but I gave instructions that all the papers should be put in, and I understand that that was done. It was only when you delivered your speech that the idea suggested itself to me that some papers may have been omitted, but I am perfectly certain from what I know of the officers that if any have been omitted they have been omitted purely from mistake and nothing else.

13930. Did any correspondence further than appears in the papers pass between the Minister and any officer of the Department (say Mr. Hickson) in reference to this matter? No; I do not think so. It was arranged, I think, between Mr. Lyne and Mr. Hickson at a personal interview, at which I was not present; therefore I cannot speak as to what took place. Mr. Lyne sent to Mr. Hickson, owing to personal efforts which were made by Mr. Clark, to get the work proceeded with. The main thing, I understand, which influenced Mr. Clark was that Contract No. 79 was about completed, and that if other work were not found a large number of men would be thrown out of employment. Mr. Hickson was anxious to have the work re-tendered; but if that had been done there would have been a gap of six weeks, and in the meantime the men referred to would have been out of employment. I suppose it was

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- the representations which Mr. Clarke made to Mr. Lyne which induced him to consent to the extension being given to Messrs. Carter, Gummow, & Co.
13931. Did no correspondence at all dealing with the matter pass through your hands? I do not think so. If so, it ought to have been printed with the papers. I can quite understand why there should be none there, because the matter was arranged verbally, as far as I know.
13932. Did Carter, Gummow, & Co. and Mr. Clarke have any interview with Mr. Lyne? Mr. Clarke may have had many interviews with him on the subject, but he had no interviews with me that I know of.
13933. As to Contract No. 69—the Marrickville contract—were the Schedules ever put before you? Before tendering—certainly not. That is a thing I have nothing whatever to do with.
13934. You are the Chairman of the Tender Board;—what are the proceedings of the Board in such a case? The practice of the Board is this: The Board comprises the engineering heads of branches, and they bring their tenders with them. Each officer takes charge of his own tenders, and he reads out a tender for so-and-so, the lowest tender, the estimate being so-and-so, recommending that the tender be accepted. That is generally put to the Board, and passed without a word, when the lowest tender is recommended, and when the amount is below the estimate. It is utterly impossible for anything else to be done. Each member of the Board has his own whole branch to attend to, and it would be impossible for members of the Board to go into details. Even if they were all engineers they could not do so.
13935. You said in your report that members of the Board did go into details? So they do, whenever there is any question. I think, if you look carefully into the part of my report to which you refer, that you will find a modifying clause. Details do sometimes come up when there are critical questions to be considered, and then the utmost care is given to the case; but when a member of the Board says "This is the lowest tender, and it is below the estimate," there is no question to go into. If a question arises from which it is evident that there is a necessity to go into the matter, it is always most carefully gone into by the Tender Board.
13936. But the acceptance of the tender is left to the head of the Department—to the recommendation which he makes to the Board? Yes; it would be impossible for anything else to be done. The Board is constituted to be an advisory Board to the Minister, and among themselves in questions of difficulty. The Board generally give up their own private time to the carrying out of their functions, and no fees are attached to the work. The Board generally have to sit after office hours.
13937. The object of the Board is to secure the proper consideration of everything which goes before the Minister? Any question which requires consideration. If the Board went into every matter, whether any question has been raised in reference to it or not, the thing would be found to be utterly impracticable. Few people appear to realise the magnitude of the work which is carried on by the Works Department. I have heard a great many remarks as to why this and that is not done, but as a rule it would be utterly impracticable to give effect to these suggestions. You would require, not only divisions, but many sub-divisions to carry out the work as some persons think it ought to be carried out.
13938. You mean that there is too much for one Under Secretary? I do not mean that at all; but the Under Secretary must depend upon the officers of the Department. By no other arrangement can the work of the Department be carried out.
13939. Suppose the head of the engineering department had drawn your attention to the Schedule of Messrs. Carter, Gummow, & Co. in connection with Contract No. 69, would you, as a member of the Board of Reference, have accepted it? You mean as to anything improper in it?
13940. I mean as it was sent in? It would be considered by the Board of Reference.
13941. But I ask you whether, as a member of the Board, you would have accepted the tender, had your attention been directed to the Schedule? I have not gone into that matter.
13942. Take the item of £50 per square yard for bluestone pitchers? I could not have gone into that matter. If Mr. Hickson, however, had said, "This is an improper amount," I should have taken exception to it. It would take me a couple of days to go through the Schedule properly. You will see, therefore, that it would be utterly impossible for me to give my attention to such details.
13943. If you were building a house, would not that price strike you as being too much? I do not go into a single detail of that kind. It would be utterly impossible for me to do so.
13944. You depend for everything of that kind upon the heads of the branches of the Department? Undoubtedly.
13945. *His Honor.*] The question is whether, if your attention had been called by one of the heads of the Department to this particular item, you would have agreed to the acceptance of the tender? If my attention had been directed to it as a member of the Board of Reference, then of course exception would have been taken to the tender.
13946. And the Tender Board would then have gone into the question? Undoubtedly.
13947. *Mr. Hickson.*] When were you appointed Under-Secretary for Public Works? In 1888.
13948. At that time I was in Newcastle? Yes.
13949. I think you were mainly instrumental in having me appointed Acting Engineer-in-Chief for Harbours and Rivers? I was. I recommended you to Mr. Bruce Smith.
13950. After that you were mainly responsible for my appointment in connection with the sewerage works? I was.
13951. You are now a Member of the Public Service Board? Yes.
13952. Since you have become a member of that Board you, with your colleagues, have approved of my being made permanent head of the Department? Yes; certainly.
13953. During the whole of the time that I have been in Sydney, since 1888, you and I have been in close touch? Yes, on all official matters.
13954. Hardly a day would pass when we would not see one another about various matters? Yes.
13955. Did you ever consider, for a moment, that I was prejudiced in favour of any particular contractors with the Works Department? Never.
13956. Was there ever anything which would indicate such a state of things to you? Nothing ever indicated to me that you favoured one contractor more than another.
13957. I suppose that if such a thing had crossed your mind, you would have objected to my being made permanent head of the Department? Certainly.
13958. Let me direct your attention to page 254 of the printed evidence—to the last few lines of Mr. Christie's report upon that page;—will you read the report, and tell me whether you know of anything which would warrant Mr. Christie in making such a statement? Not the slightest. 13959.

13959. Have you explained how these papers were prepared for Parliament? Yes. I explained on a former occasion that I directed that all the papers asked for in the motion should be carefully supplied.
13960. To whom could Mr. Christie have referred when he said papers were knowingly withheld;—had I anything to do in connection with the preparation of the papers? No; I do not think I had any conversation with you on the subject. Mr. Davis was the officer who principally dealt with the papers. I think he more particularly prepared them, and they were afterwards checked, I think, by Mr. Hungerford.
13961. Then you cannot account for Mr. Christie's coming to such a conclusion as that stated? No; I cannot.
13962. As a matter of fact, a few papers were left out? Yes; but I have not the slightest doubt but that they were left out by accident.
13963. You will find at page 259 of the evidence a list of the papers omitted in connection with Contract No. 72? These papers were not asked for. They relate to the Alexandria and Erskineville contract. When the matter came before me I gave instructions for papers to be prepared. When I first looked at the matter I thought that the Marrickville contract was referred to. I myself do not know the contracts by their numbers, and I gave instructions that all the papers should be included. The clerks told me that the papers could not be found. They said they had been left at the Court, they thought; and I was wondering what could be done, when Mr. Davis came to me and explained that the papers related to a contract altogether different from that referred to in the motion; that the motion referred to the Marrickville contract, whereas the papers for which we were searching related to the Erskineville and Alexandria contract. Inasmuch as the bond was referred to in connection with Contract No. 79, it was thought, however, that the papers we had should be put in. There is not a single paper or memorandum, not a single word of mine, that I could have the slightest wish to keep back from Parliament or this Commission.
13964. You said that the number of contracts dealt with by the Public Works Department annually was between 3,000 and 4,000;—do you not know that last year we had 5,050 contracts? I am very glad of the correction. I merely mentioned the matter without having gone into the matter carefully.
13965. Would you be surprised to hear that within the last two years the Department has dealt with over 10,000 contracts? I was not aware of that.
13966. *Mr. Parkes.*] With a perfect system, does it matter whether there are 500,000 contracts or 5,000 contracts? Certainly not; but the persons who finally deal with the contracts cannot possibly go into all the details. There ought to be such a system that when the matter comes up finally the head officer can accept the certificate of the engineer, or of his subordinates.
13967. In other words, if one Under Secretary is not enough for the work he should have an assistant? The Under Secretary, as far as engineering matters are concerned, must accept the reports of the engineers of the Department, and so also must the Minister.
13968. In a well-regulated office pressure of work is no excuse for mistakes? No. There may have been an unusual pressure of work at particular times, and then, as in all human undertakings, mistakes may have been made.
13969. *Mr. Hickson.*] With regard to the number of 5,050 contracts, do you happen to know how many of those pass through my hands? I should say the larger part of them.
13970. Would you be surprised to know that the number is 4,500? No; I should not be surprised at that.
13971. Following up your own argument, I suppose it would be physically impossible for me to examine the details of all these contracts? Yes.
13972. I have to accept the reports of my subordinates? Yes.
13973. *Mr. Parkes.*] Members of Parliament have also to deal with things generally;—they do not know the details of all these contracts? No; but in preparing papers the rule is to liberally interpret the motions of Members.
13974. When the motion refers to copies of papers and correspondence in connection with contracts at Marrickville, and when there are three contracts at Marrickville, why are not all the papers given? No. 72 was not at Marrickville at all. It was at another place altogether. It turned out to be at Alexandria and Erskineville. Of course, I merely took the explanation given to me.
13975. Is not that only a quibble? No; it is a different contract altogether.
13976. Marrickville extends all over the lower portion of the contract? Not that I am aware of. I was informed that it had nothing whatever to do with it. I say, with due regard for the solemnity of the occasion, that my anxiety was to give every possible information in my power. There is not a scrap of paper, there is not a single document, there is not a single conversation in which I have taken part, but which could be exhibited and reproduced to the whole world, as far as I am concerned. I would not mind the whole world seeing and knowing all that I have done in administering the Department. I have had over thirty-six years in the Government service. I have held some of the highest posts under the Government, and I think my word ought to be taken.
13977. If the papers connected with Contract No. 72 bore materially upon one of the other contracts, surely they should be put in? All the papers that did bear upon that contract were put in. The tender was put in, the final certificate was put in, the bond and contract was put in. It was intended that the bond should go as an Appendix, because it was recited in connection with Contract No. 79. Had it not been recited there none of it would have gone in.
13978. You put in part of the papers only? We put in only the papers referred to in the motion. We put in the other papers, as I have just explained, because the bond was recited in connection with Contract 79. It was really intended to go in, not as part of the papers generally, but in the shape of an Appendix.
13979. Was the claim not referred to? Yes; the full amount of it was given.
13980. But not the particulars? The amount was given. It was put in incidentally to Contract No. 79.
13981. But if it were worth mentioning at all the whole papers should have been put in? Supposing that all the papers had been put in in connection with Contract No. 72 there would have been almost as many papers again as are contained in this return.
13982. But I mean the papers bearing on the claim? I honestly thought that we had put in everything that could be fairly asked for—in fact, more than could be fairly asked for. There is not a single paper in connection with that work that I could have any wish to keep back from you or anyone else. There is  
not

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21 Aug., 1896. not a single thing in connection with these contracts which I would mind you or the whole world knowing. I notice that Mr. Bagge, a former officer of the Department, made some remarks about myself which, I think, I can afford to look over. I wish to say with regard to Mr. Bagge, however, that during the whole time that I was Under Secretary I do not think I ever had one unpleasant word with him, nor do I think I ever had one unkind thought with regard to him. It was not often that I saw him. He was not retired upon my recommendation, but on the recommendation of the Engineer-in-Chief, in which I concurred. He is an old gentleman—I think he is over 70 years of age—and he has arrived at that time of life when it is regarded as natural that a man should retire. He had rather less than fifteen years' service, I think, and he went out with a gratuity of £800 or £900 and six months' leave of absence.

13983. *His Honor.*] Before he retired, had his memory begun to fail at all? I did not see him often enough to be able to form an opinion as to that. But sometimes when I have sent for him I have found it somewhat difficult to make him understand things which I have explained to him, he being so very deaf. I think that if you ask Mr. Young, the present Minister, you will find him of my opinion.

13984. Mr. Bagge was a good officer? Yes, in his day; but I think he has passed his day so far as active service is concerned.

Joseph Davis recalled and further examined:—

J. Davis.  
21 Aug., 1896. 13985. *Mr. Parkes.*] With a register so perfectly kept as that produced, and with so copious an index, it would be impossible to miss a letter, no matter what Branch of the Department it might be in, you would think? If that register were examined it would indicate what papers were in existence with reference to any particular contract or any particular subject.

13986. In any part of the Department? I do not know that it would indicate where they were; but it would indicate whether they had been registered or not.

13987. *His Honor.*] Do I understand that that is a register of all the papers in connection with each particular contract? Yes; all the papers when they are received by the Branch are sent to the record office, and are there recorded. They are then issued to the officers concerned.

MONDAY, 24 AUGUST, 1896.

William Caughey sworn and examined:—

W. Caughey.  
24 Aug., 1896. 13988. *Mr. Parkes.*] What is your occupation? I am a dealer at present.

13989. Were you a labourer previously? Yes; I was a sewerage miner and labourer both.

13990. Have you worked on many of the sewers? Yes, on a good few.

13991. Have you ever worked on Carter & Co.'s works? Yes.

13992. Which works? In Victoria-street, at Waverley, at North Shore, and at the Glebe.

13993. In connection with the works at Waverley, do you recollect any material being condemned there? No.

13994. Do you recollect any material being put in the works there which was not good material? Into the sumps.

13995. At Waverley? At the Glebe.

13996. Not at Waverley? No; I never had anything to do with concrete at Waverley.

13997. Did you ever have to do with the mixing of cement for brickwork there? No.

13998. You do not recollect a portion of the work having to be taken down on account of the bad brickwork? In Waverley I heard of it, but never saw it.

13999. Do you know what the work consisted of? No.

14000. You never saw it? I do not recollect what it consisted of there. All I know is that it was brickwork.

14001. You do not know whether any brick arches were taken down? I could not say.

14002. At the Glebe, did you do any of the concrete work for the sewers? Yes.

14003. You did some of the concrete? I did some of the concrete for the sumps, perhaps.

14004. How was it mixed? Not too well. The gauges were rather filled over, and sometimes a bit more was thrown in than ought to have been.

14005-6. There has been evidence given here—heresay evidence certainly—that a piano-case was put down one of the sumps;—do you know anything about it? No; I don't think such a thing was put down a sump. I don't think a piano-case would go into a sump properly.

14007. Did you build many of the sumps at the Glebe. A few in Derwent-street, such as No. 12 and No. 11, and down as far as No. 10.

14008. How were they filled up? No. 11 was filled up very badly in the bottom.

14009. What was it filled up with? Principally big stones in the bottom, but not a great quantity altogether; you might say 2 feet of it was thrown in roughly.

14010. In the others, what sort of material was put in? Principally metal.

14011. Did you do any of the invert between No. 12 and No. 13? No. We put down the pats for the labourers to start on.

14012. Do you recollect what height they were above the surface? I could not exactly say. Some varied a little. In some places the level was a little bit lower, and that was filled up mostly with concrete.

14013. What was the bed of the foundation of the sewer, rock or shale? Principally shale. It is all shale from No. 12 down.

14014. Do you recollect about the average height of these pats? I could not say exactly their average height.

14015. Were they 6 inches? Some of them might come to 6 inches, some to 5 inches, and some to 7 inches.

14016. Any less than 6 inches? I would not be certain.

14017. Was the concrete put in to form the invert good? Mostly what I have seen put there was. I never did any of the concrete along the invert from No. 12 to No. 13. I never mixed any concrete for them.

14018. Where did you mix concrete for? No. 8.

14019. Was that good or bad? Part of it. Some gauges went down properly, and some did not.

14020. What would you call a bad gauge? Say about a dozen shovels overfull.

14021.

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14021. Was all the work done by shovelling? Where it was badly mixed.
14022. Did you see any of the sandstone and the sand for the concrete sifted? No.
14023. Was it screened? I never saw any of it screened.
14024. Was there a screen on the job? Not where I was.
14025. How was it mixed together? The gauge was filled with white metal, and then the sand and a cask of cement would go on the top.
14026. Was it screened metal? It may have been screened before it came there.
14027. Was not the sandstone-metal screened? It was not screened on the job. It may have been screened before it came there, but not at the shaft.
14028. How was it taken out of the heap—shovelled or forked? Shovelled at the shaft.
14029. How was it lifted before it came there? I could not say.
14030. It would have to be tipped by the cart? Yes, at the shaft.
14031. And then shovelled? Yes.
14032. Do you know where it came from? I could not say exactly where. It came from different places all round.
14033. It did not come from the job itself? I could not say exactly.
14034. Was it brought there ready mixed? Not ready mixed.
14035. Where did the sand come from? I could not say where. It was fetched there in carts, but I could not say where it was fetched from.
14036. Did you work on the Annandale job? No.
14037. What shafts did you work in besides Nos. 11 and 12? I put the pats between Nos. 12 and 13.
14038. What else did you work at? At the driving.
14039. You were a miner? Yes. I was doing that. At the latter end, I was scabbling.
14040. Was the work blasted or taken out by gadding and guttering? It was all blasted along the Glebe job.
14041. In the shale? In the shale and in the rock—all bar the muck.
14042. In scabbling you went after the blasting? Yes.
14043. What was about the average of the margin left from the inside of the sewer to the side of the excavation? I could not recollect perfectly; we always had to measure from the centre line. We marked it along with a stick; we went along from the line up with a stick. We had one for the top, one for the bottom, and one for the sides; we took it off according to that measurement. It is a good while since I was on that job. The last job I worked on was at North Shore.
14044. Who gave you the measurements in the Glebe contract? Generally, the carpenter, by Mr. Reid's instructions.
14045. Was he the manager? Mr. John Reid, manager for Carter & Co.
14046. Do you know Mr. Chiene, the engineer? Yes.
14047. Was he the engineer on the Glebe job? Yes.
14048. Did he ever have a conversation with Jack Reid or work with him? I suppose he had a word with him, but I could not say.
14049. Do you know Jack Reid very well? Yes.
14050. Did you ever have any conversation with him on the Glebe job? I have spoken to him on the job when he was general manager—on the top mixing concrete and such like.
14051. Did you know a man named Goddard who was on that job? Yes; I think his name was Harry Goddard.
14052. Did you ever hear Reid and Goddard have a conversation? No.
14053. You don't know whether Goddard ever threatened to expose any bad work? I could not say.
14054. You never heard such a remark made? I do not recollect anything of that.
14055. Was Reid a man who insisted upon your doing good work or asked you to do bad work? No. After the mixing of the concrete, we had a man who was supposed to be over us, and we had to go by his instructions.
14056. Who was that man? He is not alive now. It was George Humphreys. He was the man I worked under principally then.
14057. Would he instruct the men to do good work or bad? He would start doing inferior work, and we would have to do the same.
14058. How many sumps did you work on? Only No. 11 and No. 12.
14059. At which one were the stones put down? No. 11.
14060. What was put down in No. 12? It was pretty fair; not so much stone went into that.
14061. What would be the thickness of proper concrete in the form of the invert for the sumps? From the top of the stone in No. 11 to the top of the sump, I daresay there would be 4 feet of concrete, or so. Sumps are supposed to be 6 feet deep.
14062. Did you ever work at Annandale? No.
14063. Or at Johnstone's Creek? No.
14064. I suppose the Glebe was the last job you worked on? No; at North Shore.
14065. Did you ever notice defective work on any other of Carter & Co.'s jobs? No.
14066. Was the concrete generally of the description you stated on the works—on the Glebe job, for instance? At the points where I was working it was.
14067. On the other works? I could not say. I never had anything to do with them.
14068. It was your only experience of concrete? Yes.
14069. Who was the Government inspector for the Glebe job while you were there? Mr. Gledhill, I understood.
14070. Would he be at hand when you were putting in too large stone? No; there were inspectors under him.
14071. How many were there altogether? I do not remember the name of the one who was mostly along with us.
14072. Was it Corpe? No.
14073. Was his name Dick? Yes.
14074. Was it Dick Eyre? I could not say; his name was Dick.
14075. What other inspectors were on that job? I could not say.

- W. Caughey. 14076. Who was the resident engineer supervising over all? I think Mr. Rudolph was.  
 24 Aug., 1896. 14077. Did he go much to your works? Yes; he used to be along pretty often. Of course he might be there many a time when we were underneath at tunnel-work and we never saw him.  
 14078. Did you do any of the filling at the back of the shafts? A little.  
 14079. What was put in there? Most of it stone, as a lining behind the work.  
 14080. Any concrete? In places.  
 14081. Do you mean stone without concrete? In large openings there would be stone put in and concrete put over the top—that is, towards the surface.  
 14082. What shafts were these;—Nos. 11 and 12? That was No. 8, if I do not make a mistake.  
 14083. Would it be No. 9? I could not tell exactly whether it was No. 8 or No. 9. I think it was No. 8. I only filled up one or two, but I would not be certain.  
 14084. As far as the cement is concerned, do you know where they got this cement from? No.  
 14085. When the barrel was brought on to the works, what was done with it? Principally smashed up and taken away. All the barrels I had anything to do with were.  
 14086. Did they have the ends in them; were they complete barrels? No; they were all cut right along. We used to take them away and give them to children about.  
 14087. When they were brought to you were they intact? They seemed to be all solid and complete. All the casks I ever cut seemed to be as if they had come from the town or the bond.  
 14088. In that invert of the Glebe sewer did they ever mix up shale with the concrete instead of bluestone? I never saw shale mixed up.  
 14089. Would the deepest portion of the batch you put in be 7 inches? I could not say exactly. We had the measure there, but it has run out of my head. We always put them along to the right height. They were not all of the same height.  
 14090. Did the Government inspectors fix the height of these pats? Mostly. The inspector generally saw that we had the level of them.  
 14091. Did they fix the depth of the filling? Not that I am aware of.  
 14092. *Mr. Davis.*] With regard to the shaft filling;—you spoke of the shale and other soft material you put between the brickwork and the shaft excavation? Yes; it was stone and such-like round about the shaft.  
 14093. The ordinary filling? Yes.  
 14094. You did not refer, then, to the concrete? No.  
 14095. As a matter of fact, pretty well all the shafts at the Glebe are small brick shafts, and then the space between the outside of the brickwork and the inside of the excavation of the shaft is filled up with that kind of material? I could not say. It was a little bit I did. I could not be sure whether it was No. 8 or No. 9.  
 14096. The shafts you referred to were done in that way? Yes.  
 14097. The pats you spoke of were put in between Nos. 11 and 12;—what were they put in with? Concrete.  
 14098. What kind of concrete? Proper concrete.  
 14099. What was the stone which was used to make up the concrete? I believe it was bluestone.  
 14100. Did you mix it? I helped to mix it.  
 14101. On the job? On the job.  
 14102. Did you put in the pats? The pats were put in, I understand, in the proper material.  
 14103. Were you working at the pats below or mixing concrete on the top? I did both.  
 14104. You were sometimes on the surface and sometimes below? Yes.  
 14105. So that you had an opportunity of seeing what kind of concrete was used? Yes.  
 14106. In that concrete was the proper quantity of cement put? Yes. All the pats I put in were put in with the proper material as far as I was aware.  
 14107. Did you see any of this bad filling you spoke of in sump No. 10? No.  
 14108. Did you see any bad filling in sump No. 12? There were other men working there, and I was down by No. 11 sometimes.  
 14109. Did you see any of it put in No. 12? Yes.  
 14110. What was it you saw there? A kind of shale and stone in the bottom.  
 14110½. Was this left in the bottom of the sump, or was it put in? It was put in.  
 14111. Where was the shale got from? Round the shaft.  
 14112. Was it flung down the shaft from the top? It was thrown down the shaft.  
 14113. Before you started to concrete? Yes.  
 14114. Was that what occurred at shaft No. 11? Yes.  
 14115. Not at No. 12? At No. 11 and No. 12.  
 14116. To a greater extent at No. 11 or at No. 12? At No. 11, I think.  
 14117. How much of that shale would be flung down from the surface into the bottom of the sump before you started to concrete? It might be a foot or 18 inches. I do not know that it would average that much all over.  
 14118. How did you see it done—with shovels or with the hand? With the hand.  
 14119. Large pieces? Large pieces—that is, lumps about the size of my head, and so on.  
 14120. What size was the shaft? 5 feet x 6 feet.  
 14121. The depth of the sump—6 feet? They were supposed to average that.  
 14122. What you say is that a small quantity of shale, to the extent of 9 inches or a foot, was put in before they started to concrete? It might come to a foot, or it might come to 18 inches.  
 14123. You did not go down to see how it was? No.  
 14124. Was the inspector present when that occurred? No.  
 14125. How was it you came to do it? We did that when it was over the time.  
 14126. You mean after hours? Yes. I would not swear whether it was done after time in No. 12, or whether he was up at No. 11.  
 14127. You were ready to start concreting? Yes.  
 14128. Before you put the concrete down you put the shale down? Yes.  
 14129. The inspector knew nothing about it? No.  
 14130. How was it you came to do it? The man who was over us was supposed to order us what to do.  
 14131. *His Honor.*] Who was that? He is dead. It was Mr. Humphreys. 14132.

14132. *Mr. Davis.*] Did he order you to put down the shale? Yes. He says, "Put this stone in,"— *W. Caughey.*  
and when you are doing things like that you do not speak too plain.
14133. A kind of a wink was as good as a nod to a blind horse? Yes. 24 Aug., 1896.
14134. Did you do any concreting at the Glebe except in the pats between No. 11 and No. 12 shafts, and the sumps at No. 11 and No. 12 shafts? I mixed some metal at No. 8. I mixed some on the top and sent it down for the invert:
14135. You helped to mix that concrete? Yes.
14136. That was bluestone? Yes.
14137. What was put in the sumps Nos. 11 and 12? Sandstone was put in No. 11 and No. 12 on top of the faulty stuff in the bottom. There is supposed to be white metal concrete in the bottom of the sump.
14138. After you had got so much white metal in, you started to put in bluestone? I only put in white metal.
14139. You told us just now the way you did it—you put in a few extra shovelfuls into each gauge? That was at No. 8 shaft.
14140. That did not occur at No. 11 or No. 12? No. It did occur at No. 8.
14141. How many shovelfuls did you put in extra to the gauge? Sometimes it might be a dozen; sometimes it might be less.
14142. You piled the box up a little bit, I suppose? Yes.
14143. Did you put any extra sand in it? It might be a shovelful or so.
14144. It was not the custom to get a straight edge and level the stuff off, was it? No; you were supposed to fill the box level.
14145. You were supposed to fill the box level and then to leave it; but the inspectors never split straws, did they? No.
14146. What you say is that a few extra shovelfuls went on top of the gauge-box; you made it round instead of, as you thought it should be, flat? Yes.
14147. You say that a piano-case or a piano could not possibly be put into a sump? I do not consider a piano-case would go down a sump properly.
14148. It is too big to go into a sump? It would not fit properly in a sump, I think.
14149. *Mr. Carter.*] It would be a very difficult matter to put a piano-case down in any case? Yes.
14150. Considering the size of the shaft, a piano-case could not be put down without being lowered into the sump with proper tackle? No; I do not consider a piano-case could go down very well.
14151. You never received any instructions from any member of the firm of Carter & Co. about putting in a little defective work or throwing boulders down? Never.
14152. Or from Mr. Reid, their manager? No.
14153. You did it entirely, if you did it at all, on your own responsibility? Practically the responsibility rested with the man who was over us.
14154. *His Honor.*] You say there was never a Government inspector about when you were doing what you thought was bad work. There was no inspector about at the time. His eyes were off us when anything like that was being done.
14155. *Mr. Parkes.*] Used you to work late at night and early in the morning? When I was at work early in the morning it was mostly for scabbling in that line.
14156. You never came early in the morning in order to get the defective work in? Never.
14157. You did it late at night? I did it late at night. That is how the sumps were done.
14158. You said that proper cement was mixed for the pats between No. 11 and No. 12; what was the balance of the material that went down; a pat would not be very thick;—what size is a pat? It would be 8 or 9 inches across.
14159. How far distant would they be spaced? I would not be certain.
14160. What was your levelling rod? They were just these common boning-rods.
14161. What distance would it be? I do not recollect exactly.
14162. Would they be 10 feet? I do not think they were 10 feet.
14163. Were they 6 feet? That would be about it. I could not say whether it was 5 feet or 7 feet. It was not 10 feet.
14164. Did you put in the filling? No.
14165. *His Honor.*] When you spoke of the pats being of a certain thickness, what sort of ground were you working in then? It was pretty firm shale.
14166. *Mr. Parkes.*] Was there a piano-case kept on that job as a tool-box? There were a number of piano-cases for us to keep our tools in at most of the shafts.
14167. I suppose they could break up a piano-case and drop it down, supposing it was too big to go down? It could be broken up and put down. I never saw it done.
14168. What are the dimensions of a piano-case—they are only about 4 feet high, are they not? A piano-case might be 2 ft. 6 in. wide and 4 ft. 6 in. or 5 feet long.
14169. What would your shaft be? It would be about 5 feet x 6 feet.
14170. It could go down the shaft? If it was lowered down properly; but if thrown down from the top it certainly might jam against the sides.
14171. *His Honor.*] It would go down end on? It might jam against the sides. I do not think much of that.
14172. It would do as well as the stones and lumps of shale as big as your head once it got down? Once it got down it would.
14173. I do not quite understand what you mean as regards the concrete at the top of the shaft;—was the filling at the back of the brickwork stone? I mean when it comes near where the casting comes they generally put concrete round that.
14174. *Mr. Davis.*] It is put on to the brickwork? It was just thrown round the top behind the brickwork.
14175. The concrete forms the top of the shaft? Yes.
14176. *His Honor.*] The foundation of the pitchers, I suppose? The shaft I principally allude to is No. 11.
14177. *Mr. Parkes.*] What is the size of the stones put at the back of the shaft—large stones? Sometimes a shaft is pretty wide, and the stones might be the size of your head.
14178. Would it be of the shape of spalls? Some of it might be round, some of it might be 3 inches, and some of it might be 2 inches.



- W. Caughey. 14179. What is the earth surface on the bank—is it shale? No. 8, I think, was shale.  
 14180. Shale at the back of the stone? I could not say.  
 24 Aug., 1896. 14181. What is the nature of the earth above the layer of shale? I cannot say.  
 14182. How far up does the shale go? I could not say exactly. Some of these shafts, No. 8 and No. 9, I think, were all shale.  
 14183. What is the thickness of the brickwork—9-inch? I could not say.  
 14184. Is it built in cement? Yes. I never had anything to do with the mixing of the cement for brickwork.  
 14185. What is the depth of the shafts, No. 11 and No. 12 from the surface? I forget the depth.  
 14186. Twenty feet or 30 feet? More than 30 feet.  
 14187. Is it 50 feet? I think No. 12 must be about 50 feet, but I would not be certain.  
 14188. What is there at the bottom of the shaft above the roof of the sewer—any concrete? I could not say.

William Burcombe sworn and examined:—

- W. Burcombe. 14189. *Mr. Parkes.*] What is your calling? I am a contractors' carter.  
 24 Aug., 1896. 14190. Did you draw the material for Contract 79 on North Shore? Yes.  
 14191. Did you draw it all? Mostly all.  
 14192. That was a contract of Mr. Carter's? Yes.  
 14193. What material did you draw? I carted cement.  
 14194. Did you draw the whole of the cement? No.  
 14195. You carted a great portion of it? Yes.  
 14196. Do you know who else carted the cement? A man named Booth carted some.  
 14197. Who else beside yourself and Booth carted cement? J. Molloy.  
 14198. Were you three the only people who carted cement? No; there was also a man named Walsh.  
 14199. Would that be the lot? Yes.  
 14200. Were they working for you? Walsh was working for me.  
 14201. Booth was not? No.  
 14202. Where did you generally cart it from? From a good many places. I have carted a considerable lot from the foot of the hill at Milson's Point. I have carted cement from St. Leonard's Station; I have also carted cement from Shea's Creek.  
 14203. How much did you cart from Shea's Creek? I could not say how much. I carted a considerable lot from Shea's Creek.  
 14204. How much sand? I could not say. I never kept any books. I could only guess it. I made a memorandum from day to day, so as to know how to get my money.  
 14205. How many weeks were you carting? I had two double teams each drawing twelve casks. I suppose they were carting on and off for about three weeks.  
 14206. *His Honor.*] How many loads a day did you draw? Three loads a day and 12 casks in each load.  
 14207. *Mr. Parkes.*] Do you keep books? I do not keep any books except from day to day, in an ordinary school exercise-book.  
 14208. Could you produce these books? No; except for just the ordinary work I am doing at the present time.  
 14209. When you were carting from Shea's Creek which way did you go? I did not cart myself. I did not go myself. The men always took the shortest way. I could not say what way they would go.  
 14210. Did they go over in the punt? Yes.  
 14211. Did you cart sand? I carted a considerable lot of sand.  
 14212. Where from? I carted a lot of sand from Bourke-street.  
 14213. Did you cart any sand from Mossman's Bay? No; from Balmoral I carted a lot of sand.  
 14214. Did you ever cart any sand from the beach at Mossman's Bay? I did not cart sand from there. I am sure Booth carted sand from there.  
 14215. Have you no books at all which you could produce? No.  
 14216. How were you paid? Every fortnight.  
 14217. In what? In notes.  
 14218. Not by cheque? No.  
 14219. How much were you paid, roughly? Well, I have had as much as £40 and £50 a fortnight.  
 14220. You were never paid by cheque? No; I have been paid by cheque a small amount casually.  
 14221. At odd times? Yes; but very seldom.  
 14222. Did you give a receipt for your payments? No; I would not give any receipt.  
 14223. How did you render accounts to Carter & Co.? By ordinary bills.  
 14224. Were you not asked to receipt these accounts? No.  
 14225. Never? Never.  
 14226. On no occasion were you paid by cheque for a full fortnight's carting? Never.  
 14227. In what way did you appear on the pay-sheet? I suppose I appeared as an ordinary working man on the pay-sheet.  
 14228. In your own name? Yes.  
 14229. Did you sign any pay-sheets? Never.  
 14230. Not for your money? No; I always got my money handed to me at the door.  
 14231. You never signed a receipt? No.  
 14232. You got £40 without giving a receipt? Yes.  
 14233. *Mr. Davis.*] Can you remember when it was you carted that cement from Shea's Creek to Contract 79? No.  
 14234. Do you remember the work being stopped at Shea's Creek between Mitchell Road and the bottom of M'Donald-street? Yes.  
 14235. Was it about that time? It was.  
 14236. Do you remember what cement it was you carted? No.  
 14237. You do not remember the brand? No.  
 14238. What you say is that you had three double-horse drays carting for about three weeks, and that each dray would take twelve casks at a time, and would make three trips a day? Yes.  
 14239. *Mr. Carter.*] You have been working for us a long time? Yes. 14240.

14240. At day-work, piece-work, and every other sort of work in the carting line? Yes.  
 14241. You are always carting cement from one contract to another? Yes.  
 14242. Also material of various kinds? Yes.  
 14243. When we ran short of material on one job you went yourself or sent someone else to another job for material in order to keep us going—that is a fact? Yes.  
 14244. You say you were never paid by cheque? Yes.  
 14245. You always got your money at the door like other men? Yes.  
 14246. The other carters got their money in the same way? Yes.  
 14247. You were paid fortnightly? Yes.  
 14248. Did you ever know anyone to give a receipt for wages or for work done on our contracts? No.  
 14249. Or on any other contract apart from our contracts;—on Mr Pritchard's or anyone else's? No.  
 14250. Contractors do not take receipts from their workmen? No.  
 14251. Regarding the sand supposed to have been carted from Mossman's Bay;—are you sure that Booth carted it from Mossman's Bay? He carted crushed stone, and that is where I think he got it.  
 14252. All the sand you carted was from Balmoral Beach and Bourke-street? Yes.  
 14253. *Mr. Parkes.*] Did you ever cart cement from North Shore to any other contract? No.  
 14254. You never carted cement from there to Annandale? No; I never carted cement from North Shore to Annandale.  
 14255. Did you never cart cement from North Shore to Johnstone's Creek? No.

W.  
Burcombé.  
24 Aug., 1896.

George Christie recalled and further examined:—

14256. *Mr. Parkes.*] When your evidence was interrupted the other day you were reading a number of compilations of papers. With reference to papers omitted from the Parliamentary return, was there any difficulty in finding out where those papers were by the books in the Government office? No.  
 14257. Have you perused the index to the register and the register kept by the Department? Yes.  
 14258. Is every paper there carefully minuted? Yes.  
 14259. Will you explain to His Honor the nature of the index and the register? I may say that, in the first place, I have extracted from the index, as regards Contract No. 72, for the purpose of placing it before His Honor, this list of papers, being a total number of 106 papers. In my previous evidence I merely enumerated fifteen papers, which, perhaps, were considered the more important of the papers.

[*Mr. Davis inquired of His Honor whether, seeing that Mr. Parkes did not ask for these papers, it was competent for Mr. Christie to go further into the matter.*

*Mr. Christie stated that the fifteen papers he originally submitted connected Contract 72 with Contract 79, and that these particular papers were material to Contract 79.*

*His Honor said he would admit the evidence.]*

*Mr. Christie:* All the papers originally submitted in connection with Contract 72, in the Parliamentary return, are numbered there 1, 2, 3, and 4, and they appear in the registers. The other documents, which are not included, are as per this list. The mode of procedure, which it would seem would be the correct procedure in taking out documents for a Parliamentary return, would be, first, to refer to this index, and from that to get a schedule of all the papers referring to that contract—(the papers, I understand, of each contract have been put away in various bundles)—then to refer to the bundles, and check over the papers which exist there with the papers as per this list. By so doing, a full list of the papers can be obtained, and their whereabouts can also be ascertained. A registration of the papers in connection with Contract 72 first appears at page 46 of index No. 3, which is the index to register No. 3. The documents in register No. 3 are recorded with progressive numbers, commencing with No. 1 of each year, and the papers are numbered as regards Contract 72, commencing with the year 1891. The first number which appears to be indexed and recorded in the register reads as follows: "Progressive No. 91-151; when registered, January 23; from whom, C. H. Bagge; date, 22/1/91; nature of application and representation, Advertisement, Contract No. 72, Munni-street." There are columns for the issue and return of the papers marked "Referred to whom, and when." This shows that the papers had been issued out on 23/1/91, and returned on 27/1/91. Following on in the same way the whole of these papers in connection with Contract 72 have originally been entered in the registers, and have been indexed in the indices. Where the papers in any case have been issued there is a record of their issue, showing to whom they have been issued, so that at any time if a paper is called for the person keeping the registers can turn up and give information as to the person in whose possession the papers are.

14260. *His Honor.*] If they are not shown to have been returned? Yes.  
 14261. And if they are shown to have been returned they ought to be found in the bundle? Yes.  
 14262. *Mr. Parkes.*] With reference to Contract 79, will you turn up the index? Contract 79 is in No. 4 register.  
 14263. Does that appear to be kept as fully as the others? Yes.  
 14264. And in the same form? Yes.  
 14265. With regard to Contract 77, will you turn up the index? It commences in No. 5 index with registered paper No. 170—"Advertisement." Then follows 316 "Tenders"—and goes on in the same way as the others.  
 14266. It seems to be kept in just as complete a manner as the others? Yes.  
 14267. So that, never mind where the papers referred to in all these matters might be, they could be obtained? The system is planned to be complete, so that all the papers can be produced.  
 14268. *His Honor.*] Do these books go in years? No; a register is used until it is filled up; a new index is started with each register; No. 3 index applies to No. 3 register, and so on.  
 14269. All the contracts come under the letter "C"? Yes.  
 14270. The numbers you pick out as they go? Yes.  
 14271. *Mr. Parkes.*] The letters are kept in a similar fashion? The letters written by the Department are copied in the letter-book, and are indexed more particularly to persons than to contracts. This seems not to be quite in keeping with the registers. In some of the letter-books they have been registered by reference to contract. The system has not been uniform as regards the letters from the Department.

G. Christie.  
24 Aug., 1896.

G. Christie. 14272. Have you prepared the papers in connection with the claim of M'Namara, the wool-scourer, for damage done to him by the withdrawal of water from his dam? These papers have been picked out; they are not quite put in proper order.

24 Aug., 1896.

14273. Will you first read Mr. Waller's report on the scheme? Yes; it is as follows:—

WALLER, T. F.

REPORT on claim made by H. Macnamara for damage through Sewerage Works, Shea's Creek.

70 Pitt-street, Sydney, 5th March, 1892.

MACNAMARA'S CLAIM v. SEWERAGE BOARD.

Sir,

Agreeable to your instructions I, on the 1st instant, in company with Messrs. Hickson, Davis, M'Elhone, and Wilson, visited Mr. Macnamara's wool-scouring premises, inspecting the dam, as also Shea's Creek, the "storm-water channel," the bed of the old creek, and the dam belonging to the wool-scourers above Mr. Macnamara's works, and on the same creek marked "C" on plan, also the land intervening between Macnamara's dam and what is known as the "earthen drain."

I subsequently revisited the ground so as to make myself more thoroughly acquainted with the matter in dispute, and the effect, if any, caused on the water supplying Macnamara's dam by reason of certain works undertaken by the Department, and I now append my report, with sketch plan, which I trust will be found explanatory and satisfactory.

Should you desire any further information I shall be happy to supply it, as also to wait on you with Mr. M'Elhone, as I understand from that gentleman that he expects you will interview him after receiving my report.

I have, &c.,

T. F. WALLER.

The Hon. the Minister for Works, Sydney.

Ack., 8/3/92. Register and re-submit with other papers, 7/3/92. Done, 8/3/92. P.P., 92/2/81 herewith. Submitted.—J.B., 11/3/92. Seen; Mr. Waller's report appears very conclusive, and shows that Mr. Macnamara has no claim upon this Department.—W.J.L., 12/3/92. B.C., Mr. Hickson to see.—J.B., 14/3/92. Seen.—R.H., 14/3/92. Should not Messrs. Williamson and Williamson be informed?—R.H., 15/3/92. Under Secretary for Public Works. Best to do so.—J.B., 15/3/92. Approved by Minister, Order No. 1,221.—D.M'L., 19 Mar., 92. J.B. Inform.—J.B., 21/3/92. Messrs. Williamson and Williamson, 24/3/92. These papers should go to the Crown Solicitor with 94-2,805, H. and R.—R.H., 29/3/94. Under Secretary.

MACNAMARA'S CLAIM v. SEWERAGE BOARD.—SUMMARY OF REPORT.

*Storm-water Channel.*—No damage has been caused to Mr. Macnamara by its construction, but rather a benefit, as the sewerage water is now under control, as it can be connected to, or cut off from, the dam as may be considered most advisable.

2. No additional sewerage water has been introduced into "storm-water channel."

3. "Storm or surface water," the result of rain, can still be conducted to Mr. Macnamara's dam, which will be, as heretofore, mixed with sewerage.

*Shea's Creek.*—The statement that the supply to Mr. Macnamara's dam from this creek is in any way interfered with by the "storm-water channel" is contrary to facts and cannot be upheld.

*Earth Drain.*—The statement that this drain, which extends between the "storm-water channel" and the canal, drains Mr. Macnamara's dam is also groundless, as the original surface of this drain is some feet lower than Mr. Macnamara's dam, and cannot therefore be upheld. I, therefore, find that the only loss sustained by Mr. Macnamara by reason of and during the construction of the "storm-water channel" is the loss of sewerage water, totally unfitted for wool-scouring purposes, and of some of the "storm-water" which might have fallen during the construction of the "storm-water channel," but which "storm-water" would have been of little (if of any) service to Mr. Macnamara, as it would have, under any circumstances, been mixed with the sewerage water. The surface or rain water lost (if any) could not have been of much value, and the amount of such surface or rain water would depend entirely upon the season. For confirmation of remarks in this summary, *vide* my report and sketch plan attached.

T. F. WALLER.

MACNAMARA'S CLAIM v. SEWERAGE BOARD.—REPORT.

*Storm-water Channel.*—Owing to storm-water channel completed by the Sewerage Department, and filling up and levelling in some cases of the creek or watercourse, as also the deepening of the said creek or watercourse in such cases where it is made use of for the "storm-water channel," the sewerage water, as also the "storm-water" conveyed by the creek or watercourse to Macnamara's dam, has undoubtedly been diverted from that dam during the carrying out of the work up to date; but it must be borne in mind that the water so diverted would have been always sewerage water, except at such times when heavy storms took place and the sewerage water would be mixed with rain water, and in my opinion the sewerage water was not and is not fit for wool-scouring purposes. By a system of "stop-boards," marked "B" on plan attached, the sewerage water can be held until it rises sufficiently high to re-enter the old bed of the creek at the point marked "stop-board" on the plan: and by the drain pipes which are connected with the sewer on either side the storm-water in the catchment area north of Macnamara's dam, and which would naturally have flowed into the creek before it was interfered with, will now be drained into the storm-water channel and mixed with the sewerage water, and can eventually be conducted by means of the "stop-boards" into the old course of the creek to Macnamara's dam. In fact so far from the storm-water channel having permanently injured Mr. Macnamara, or cut off the water from him, it has had the contrary effect; inasmuch as it is now possible to prevent the filthy sewerage water going into his dam, or if he desires it he can obtain it, as well as any storm-water which may fall, in even greater quantities than before. The "stop-boards" are not in position, but will be placed immediately Mr. Hill's authority is obtained. Any loss, therefore, which Mr. Macnamara may consider he is sustaining is not attributable to the Department, but rather to Mr. Hill, and is plainly a matter to be settled between Mr. Macnamara and Mr. Hill. For my own part I do not think that the Department or Mr. Hill would be benefiting Mr. Macnamara by sending the sewerage water down to his dam.

*Introducing of new sewerage water into storm-water channel.*—Examination, as also the statements by Messrs. Hickson and Davis, satisfy me that the claim advanced, that extra and more objectionable sewerage matter has been introduced into the "storm-water channel" than previously found its way into the old creek or channel *cannot be upheld*.

*Shea's Creek.*—The contention that the Department has diverted the water from this creek is absolutely untenable, inasmuch as Shea's Creek is carried over the "storm-water channel" at the point where it intersects the creek, and the concrete flume now forming a portion of Shea's Creek is of the same size as the original creek, and therefore no stoppage or obstruction to the flow of water exists.

*Earth Drain.*—The statement that the earth drain which continues from the "storm-water channel," at the point marked "D," *vide* plan, is quite incorrect, for the natural fall of the water is to the "open earth drain"; and whether it was there or not, the water would not find its way to Macnamara's dam, as the cross-section levels taken by the Department show that the surface of the ground or bank of the earth drain is considerably, say 5 feet, below the level of the dam. If there is any water in the catchment area west of the "earth drain" which would, owing to the contour of the ground, naturally find its way into Macnamara's dam, it will so continue, as the drain will not interfere with it.

The statement that there is a short supply of water in Macnamara's dam and in no way equal to that contained in Eves' dam, which is above him on Shea's Creek and marked "C" on plan, is quite correct; but it is not correct to saddle the Department with being the cause of the scarcity of the supply. Examination shows the following to be at least some of the causes fairly attributable for the scarcity of water in Macnamara's dam:—

1. Large quantities of water are intercepted by Eves and others living above Macnamara, who only allow their surplus water to continue down the creek.
2. Irrigation by Chinese gardeners, who systematically divert the water from Shea's Creek subsequent to its leaving the flume and re-entering the creek.
3. The dirty state of Mr. Macnamara's dam, which has been allowed to silt up to a considerable extent, owing, beyond a doubt, to the sewerage water which previously found its way into the dam.
4. The leaky condition of the dam, which allows two streams of water to escape, the volume escaping at time of inspection being, I should judge, quite sufficient, if retained, to amply supply Mr. Macnamara's dam.

T. F. WALLER.

14274.

14274. You have a copy of the claim put in by McNamara—the number of the paper is 92-42? It does not seem to be amongst these papers. G. Christie.

14275. According to that report by Mr. Waller, does it not seem that the claim was made on account of Contract 72? The papers are with Contract 72 papers. They are dealt with as Contract 72 papers. 24 Aug., 1896.

14276. But regarding Mr. Waller's first report, does it not seem that claim is made in connection with Contract 72? If I had his plan I could say definitely, but the inference to be drawn from these papers is that it is so.

Joseph Davis re-called and further examined:—

14277. *His Honor.*] You desire to make an explanation with reference to Mr. Waller's report on the claim put in by Mr. McNamara? I do. This was not the first report or paper in connection with this case. Some eighteen months previously Mr. McNamara got an injunction out and stopped the construction of the Shea's Creek canal just below his works. Mr. Waller's report really arose out of that, although the immediate occasion of it was the construction of the storm-water channel which came on twelve or eighteen months afterwards. The two things were mixed up. J. Davis. 24 Aug., 1896.

14278. *Mr. Parkes.*] Was this cost of £6,800 charged against the Shea's Creek relief works? It was charged against the Shea's Creek canal.

14279. That is the Shea's Creek relief works;—would it not have been proper to have charged it against this contract? I do not know. The case arose from the canal primarily.

14280. From No. 72 Contract? No, from the Shea's Creek canal.

14281. In what way? Before the channel was thought of.

14282. Where are the papers to show that? I cannot tell you where the papers are. I know that is the fact. The first thing done by Mr. McNamara was to apply for an injunction against the Department to stop the Shea's Creek work on account of the loss of water he was sustaining at his dam; and the injunction was granted.

14283. *His Honor.*] This Shea's Creek work was the straightening, deepening, and regulation, of the channel of Shea's Creek? It was an entirely new channel. It is really a canal 200 feet wide.

14284. Representing Shea's Creek? Shea's Creek at that point is no creek at all. It is simply swampy land.

14285. It is an old mangrove swamp, I suppose? Yes; there is no defined creek when it gets into the level. That was the way in which this case originally arose.

14286. *Mr. Parkes.*] Then, when the storm-water channel—that is Contract 72—was commenced, Mr. McNamara made certain representations through Mr. McElhone? I do not know whether they were made in writing or not.

14287. According to your register, on 6th January, 1892, a complaint was made that water was being drawn from McNamara's woolwashing dam at Shea's Creek, Alexandria? Yes; it was merely a complaint. There was no formal claim made at that stage.

14288. *His Honor.*] What had become of the old complaint by Mr. McNamara at that stage? The injunction was still in force.

14289. The issue had not been tried? No.

14290. The issue was tried after Contract 72 was begun? Eighteen months or so afterwards.

14291. Were these works then made material evidence in the case—did they come in as aggravating his claim? Yes.

14292. The original claim being founded on the making of the original channel? I do not know that he had any claim at that stage. What he complained of was that he was likely to have one, when he got out the injunction. Then a channel was constructed, and Shea's Creek was continued afterwards. They moved in the Court to get the injunction dissolved, and they succeeded, and then they proceeded with the canal work.

14293. That was before Contract 72 was begun? Contract 72, at that stage, was finished.

14294. Were the Shea's Creek canal works in abeyance from the time the injunction was first taken out until the time it was dissolved after the beginning of Contract 72? That is the case.

14295. Contract 72 only came in as a sort of incidental head of the damage done? It aggravated the case, so Mr. McNamara said. The two were mixed up together, and I do not think it would be possible to separate one from the other, because they were taken together in the Court.

14296. *Mr. Parkes.*] Is the case settled yet? I do not think the money has been paid to Mr. McNamara. I think there is some adjustment to be made before the amount of the award is given.

14297. *His Honor.*] Did Mr. McNamara succeed on the trial of the issue? Yes, he succeeded in getting from the jury £10,000, which was reduced on law points to £3,000 odd.

14298. The final result was that £3,000 was allowed by Mr. Justice Owen to stand as the judgment of Mr. McNamara against the Department? Yes. Then there was a point as to whether it should go to the Privy Council. I think it did go before the Full Court, and that point eventually was given up.

14299. *Mr. Parkes.*] What was the total legal cost paid to Mr. McNamara? That I could not tell you.

14300. Did it exceed that £6,000? I do not know the amount that was paid.

14301. Mr. Hungerford said he would get that information by to-day—has he got it? I do not know.

14302. Mr. McNamara had another claim for damage done by smoke? Yes, at the time the original channel was being cut along the site of the canal.

14303. Did he succeed in that case? He did not press it, I believe. It was against the contractors. I never heard of any money being paid. The fact is it would be rather difficult to prove any damage. What he alleged was that the smuts from the fires they were making to burn off the reeds were deposited on some wool he was drying in a paddock.

14303½. Is this case cleared up? I do not think so.

14304. It is still hanging fire? I suppose he has abandoned it, or we should have heard something about it.

14305. *His Honor.*] What contractors were these? Carter & Co.

14306. For what contract? For the storm-water channel—that is, Contract 72.

14307. *Mr. Parkes.*] You wrote a minute on the 1st May, 1891, stating that the contractors were liable for this damage? I presume I would say that. I have not seen the minute for many years.

14308. Here is Mr. Carter's reply; will you read it? This reply is dated April 28, and my minute, which is dated 1st May, seems to have been made on that letter.

14309.

J. Davis. 14309. What does Mr. Carter say to that? He says in his letter:—

24 Aug., 1896. We have the honor to acknowledge the receipt of your letter of April 28th, *re* damage caused by fires at Shea's Creek, Contract 72, and, in reply, to state that we recognise no liability in the matter.

That was his view, and my view was different from that.

14310. The case is not settled yet? I do not know.

14311. Has the final voucher of Contract 72 been paid? Yes. [*Vide Appendix No. 54.*]

14312. *His Honor.*] Do I understand that the work on the part of Contract 72 which was alluded to in the original contract as the parts which might have been cut out was done? Yes.

14313. That part of the contract was completed? Yes. It was the upper portion where the question arose later on, when the funds were exhausted.

14314. *Mr. Parkes.*] There was a letter written by a resident of Macdonaldtown complaining that brick spalls from an old house which had been pulled down were being put in the concrete instead of stone, and there is a minute of yours with regard to that letter;—do you recollect the case. Yes.

14314½. The paper is 92-1,166? I do not remember the old house, but I remember the brick spalls.

14315. Will you read the letter? The letter, which was addressed, I presume, to Mr. Darley, was in these terms:—

I hope that you are cognisant of the fact of Messrs. Forrest and Carter's contract of continuation of concrete sewer, *via* Macdonaldtown, the above firm of contractors are building with old rubbish of bricks instead of stone, as was in the case of Messrs. Parry and Farley. As a property-holder of the borough I enter my protest. Hoping that you will see at once into this important state of affairs I will withhold my name and address.

I do not observe anything in the letter about an old house.

14316. I presume the spalls came from one of the houses that had been pulled down;—can you give the particulars of this case? I can tell you that they were vitrified bricks.

14317. Will you read your minute on that letter? My minute is as follows:—

The broken bricks referred to are far stronger than the ordinary sandstone which we use in our concrete works. They are vitrified, and are, in my opinion, equal to bluestone.

That I say now.

14318. Were did they get them from? I could not tell you what brickyard they got them from. There is a brickyard close at hand. They were very hard-burned bricks. The bricks had been exposed to the fire to such a degree that they had run together and resembled bluestone more than sandstone.

14319. *His Honor.*] Were they kiln-lining bricks? They were bricks which would be in the flue of the kiln.

14320. *Mr. Parkes.*] Don't you think the Government ought to have had the benefit of the difference between the cost of these bricks and the cost of the metal which ought to have been used? I should say myself that the bricks would cost as much as the metal.

14321. More than bluestone? I should say they would cost as much as sandstone.

14322. Sandstone would have had to be carted? These bricks would have had to be carted from the brickyard.

14323. If they were vitrified bricks they would be only waste? Yes. I do not know whether the contractors had to pay anything for them—probably not; but they might have.

14324. *His Honor.*] How were they broken—with a machine or with a hammer? They were knapped. It was an advantage to the Department to get these bricks, as they made better concrete than sandstone would.

14325. *Mr. Parkes.*] Paper 92-1,416 is a letter from the Council Clerk of Alexandria objecting to the contractors using their stone bridge or culvert;—can you explain the matter? I remember the case very well, but I cannot quite call to mind what was done. I do not know that it was their bridge. I think it was a Government bridge.

14326. Will you read the correspondence? Yes. It is as follows:—

|   |   |
|---|---|
| <p>Sir,<br/>I am directed by resolution of Council to ask whether Contractor Forrest, who is constructing the Munnistreet Stormwater Sewer from Macdonaldtown through Mitchell Road, <i>has any right under his specification to the stone which the Mitchell Road Bridge was constructed of.</i> It appears that he exercises that right in face of the Council's letter to him, cautioning him against in any way disposing of same. What is the usual practice in your Department in matters of that sort? An early answer will oblige.<br/>J. Davis, Esq., Engineer for Sewerage,<br/>Harbours and Rivers Department, 42, Elizabeth-street, Sydney.</p> | <p>Town Hall, Borough of Alexandria, June 21, 1892.<br/>I remain, &amp;c.,<br/>M. J. MADDEN,<br/>Council Clerk.</p> |
|---|---|

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, June 27, 1892.

MINUTE PAPER.

Subject:—Contract No. 72. Shea's Creek Stormwater Sewer. Bridge at Mitchell Road.

It has been the custom, unless provision was specially made in the specification, for the contractors doing the work to have for their own use any old materials which they might have to remove in order to execute the new work. In the case of the bridge at Mitchell Road, as there was nothing in the specification about the ownership, I think the contractors should be allowed to make whatever use of it they think fit.

Under clause 50 of the specification, I think we might ask the contractors to cart this bridge or any other material to any place we decide upon; but it would be rather straining the clause to use it to apply it to the ownership of the bridge in question.

I recommend the Alexandria Council be informed in terms of the first paragraph of this report.

Mr. Bagge.

J. DAVIS.

For the approval of the Engineer-in-Chief.—C. H. Ohlfsen-Bagge, 28/6/92. Write.—R.H., 28/6/92. Council Clerk, Alexandria, 29/6/92.

Copy, Letter Book No. 5 (269), marked D, page 175.

Sir,

29 June, 1892.

In reply to your letter of the 21st instant, asking whether the contractors for the stormwater sewer from Munnistreet to Shea's Creek have any right to the stone which they have taken out of the Mitchell Road Bridge, and what the usual practice is in this Department in matters of the kind, I have the honor to inform you that it has been the custom, unless provision were specially made to the contrary in the specification, for contractors to have for their own use any old materials they might have to remove in order to execute a new work. In the case of the Mitchell Road Bridge, as there is nothing in the specification about the ownership, the contractors are entitled to make whatever use of the old materials they think fit.

I have, &c.,

ROBT. HICKSON,

Engineer-in-Chief for Sewerage.

Council Clerk, Alexandria.

14327.

14327. There is a difference between your minute and the letter which was sent to the Council Clerk. In your minute you say, "I think the contractors should be allowed to make whatever use of it they should think fit," and in the letter you say, "The contractors are entitled to make whatever use of the old materials they think fit"? That is simply to make the letter readable, I presume. It is Mr. Hickson's alteration. J. Davis.  
24 Aug., 1896.

14328. Did they make concrete of the old material? No; I do not think so.

14329. What did they use it for? As far as I remember, they used it for the pitching of an inlet over Mitchell Road, to allow the local drainage to get into the sewer.

14330. Ought not the Government to have had some advantage from that? I think we had. I think we simply paid for labour, and the material went in for nothing.

14331. You paid for the full quantity of concrete—where is the item? I think this inlet was done by day labour, as far as my recollection serves me, and that the stones from that bridge were used in this inlet.

14332. Can you give definite information on the matter? I could by looking at the measurement-book, perhaps. It occurred four years ago.

14333. Paper 92-1,399 is a letter from Mr. Weedon about the silting up of the open outlet from the storm-water channel, Contract 72;—will you read it? The letter is as follows:—

Public Works Department, Sewerage Branch, Sydney, 16th June, 1892.

CONTRACT No. 72.—Silt in Open Outlet from Storm-water Channel.

Sir,

I have the honor to furnish herewith cross-sections of above outlet, on which the silt to be removed is shown in red. The top of the concrete channel is 12 ft. 3 in. wide, and the bottom width of the outlet, as shown in red, is 12 ft. 0 in. down to the 22nd chain, from which point the full width of the old work (as it now stands) will be cleared out; the original bottom was 21 feet wide.

The total quantity of excavation by the cross-sections, allowing an average area of 6.32 square feet between 33.50 and 38.28 chains (the end of the outlet, which was covered with water, and therefore I could not see what silt was laying in it), is 1903.33 cubic yards, giving 2.26 cubic yards to the yard forward.

I have, &c.,

STEPHEN H. WEEDON,  
Resident Engineer.

J. Davis, Esq., Supervising Engineer.

14334. Will you now read the minutes on that letter? The minutes are as follows:—

Since the earth which was reported in June of last year (91/1527), was washed into the open channel, which was excavated along the line of the proposed Shea's Creek canal as an outlet for the Shea's Creek to Munni-street storm-water sewer, there has been no proper outlet for the sewer. To give an outlet, as shown on the accompanying cross-sections, it will be necessary to excavate about 1,900 cubic yards of earth, which will cost at schedule rates:—

|  | £    | s. | d. |
|--|------|----|----|
| Ex. 1,900 cubic yards, at 2s. 6d. ....                               | 237  | 10 | 0  |
| Surplus material, 1,900 cubic yards at 6d.; half-price filling ..... | 42   | 10 | 0  |
| Total .....  | £280 | 0  | 0  |

I recommend that this be done.—J.D., 17/6/92. Mr. Bagge. For the approval of the Engineer-in-Chief.—C. H. OHLFSEN BAGGE, 20/6/92. Stand over for the present.—R.H., 20/6/92.

14335. Have the contractors been paid for the clearing out of that silt? No.

14336. They will not be paid? No; they did not do the work.

14337. Who did the work? We did.

14338. After the contract was done? Some time after. I do not know how long after. It was done by daywork. It did not cost as much as this, because these rates were a little high.

14339. Was not the contractor, under the specification, compelled to take that risk? I do not think so; I think it was an extraordinary risk which would not be included in any clause of the contract.

14340. How long did it remain unattended to? I suppose it must have been twelve months.

14341. It remained for twelve months unattended to? It was that time in the state described by Mr. Wheedon in this minute.

14342. Before it was attended to? Before it was cleared out.

14343. That was during the time Carter & Co.'s contract was on? Part of the time.

14344. Was it cleared out after you signed the final certificate? I cannot say positively; but I think it was.

14345. It was cleared out after you finally paid them? At any rate, I know they did not do it.

14346. Here is a curious thing I would like you to explain. In carrying out this contract, what was the length of that relieving channel you had to excavate? I think it was 50 chains, or thereabouts.

14347. That never was filled in again—it was simply an open channel? An open channel.

14348. When you signed the contract with Messrs. Carter & Co., there were 26,200 cubic yards of excavation, as stated on page 139 of the Parliamentary return? Yes.

14349. That, ultimately, was paid for as 53,410 cubic yards;—did that 50 chains make up that difference? That was the case.

14350. It made up the whole of that difference? Yes.

14351. What was the length of the original contract? I will have to look at the plans if you want to know precisely.

14352. Will you get the information? Yes.

14353. There was no filling done to that channel; it was left open? Yes.

14354. The filling is 12,000 cubic yards of the original contract, at 1s. a yard, and that is increased to 27,961 cubic yards;—where is that filling? I would have to look in the measurement-book as to that. I could not tell you at this moment.

14355. Does it not seem an enormous increase on the filling? I do not know. There was a great deal of work there which had to be done. I know Mr. Hill was most particular that all these little depressions in every direction should be filled up. He had his ranger there constantly, and we had to do what he told us to do in that way. He insisted that any depressions which would be likely to be filled with water after we had finished the work should be filled up with the excavated material.

14356. At any distance from the contract—all over his paddocks? Within a couple of chains of the side of the channel.

14357.

J. Davis. 14357. It was a really good contract at 1s. a yard? I do not think so. I think it would be worth that to put it in a cart and take it away.  
 24 Aug., 1896. 14358. Paper 92-2,000 relates to repairs to invert of sewer, recommending that brickwork be substituted for the concrete;—will you read your minute? Yes; it is as follows:—

Department of Public Works, Roads and Bridges and Sewerage Branch,  
 Sydney, 8 September, 1892.

## MINUTE PAPER.

*Subject*:—Contracts Nos. 72 and 75, Shea's Creek Sewer. Further, with reference to repairing rendering in invert of sewer, which was washed away in March last.

WHEN the sewer was finished from the eastern boundary of the Macdonaldtown Park to the open concrete channel below Mitchell Road, a length of about 44 chains, the storm-water had to be turned through before the rendering in the invert of the sewer had been allowed time to harden. It was absolutely imperative that the water should be turned when it was, because, in consequence of the flood-water not having a proper channel, properties were being damaged. Through this, large quantities of the rendering were washed away, and before the work can be considered perfect, or in such a state that it can be taken over from the contractor, the invert must be repaired.

I saw Mr. Snodgrass (Messrs. Carter & Co.) and Mr. Farley (Messrs. Parry and Farley) this morning on the ground. They appear to think that there will be considerable difficulty in keeping the water off the invert of the sewer a sufficient length of time to admit of the rendering hardening, so as to resist the wash of the water. With this I agree.

In order to get over this difficulty they propose that 18 inches of the sandstone concrete be cut away along the invert of the sewer, and brickwork be substituted. The contractors, I understand, are willing to turn the water out of the sewer to enable them to effect the repairs, cut out the concrete, and substitute brickwork, provided they are paid for the brickwork at their schedule rates. This would make the extra cost as follows, viz. :—

|   | £    | s. | d. |
|---|------|----|----|
| Messrs. Carter & Co., 17 cubic yards, 80s. ....     | 68   | 0  | 0  |
| Messrs. Parry and Farley, 23 cubic yards, 61s. .... | 70   | 3  | 0  |
|   | £138 | 3  | 0  |

Considering that the contractors were obliged to use the sewer before it was properly finished, and as a consequence the repairs are necessary, and that the brickwork would make a more durable job than the sandstone concrete and rendering it is proposed to remove, I would recommend that the proposals made by the contractors, Messrs. Carter and Co. and Messrs. Parry and Farley, be approved.

J. DAVIS.

Mr. Bagge.

Approved.—R.H., 9/9/92. Messrs. Carter & Co., and Messrs. Parry & Farley, informed.—J.D., 10/9/92.

This work has now been finished, and vouchers are being prepared; but in the case of Parry and Farley I understand that Mr. Farley waited upon the Engineer-in-Chief and pointed out that their price for brickwork was only 61s. per cubic yard, against 80s. paid to Carter & Co., and asking that they be paid at the same rate as Carter & Co. Will the Engineer-in-Chief please say whether Parry and Farley's brickwork is to be paid at 61s., their schedule rate, or 80s., Messrs. Carter & Co.'s schedule rate.—J.D., 28/11/92.

As the schedule rate (61s.) is a low price, and the repairing referred to in the within minute is something beyond the ordinary brickwork, as it includes excavating some of the cement work, I approve of the schedule rate for this special item being increased by 25 per cent.—R.H., 23/11/92.

Mr. Weedon to include in voucher.—J.D., 28/11/92. When once storm-water and household-water has passed for a time over concrete work, rendering will not bond with concrete; hence the brick lining would certainly be the best and only remedy. I therefore recommend Mr. Davis' proposition to the favourable consideration of the Engineer-in-Chief.—C. H. OHLFSEN BAGGE, 9/9/92. The Engineer-in-Chief.

14359. Was hydraulic lime used in that concrete? No; Portland cement.

14360. It was all Portland cement? Yes.

14361. Was hydraulic lime ever used on these sewers? I think a little has been used at Botany, but not very much. It was used very largely at Potts Hill reservoir.

14362. It did not answer the purpose? It is a matter of opinion.

14363. Did it not come to grief? I do not know very much about it.

14364. It was not used in this case? No.

14365. Ought not good concrete rendering, if allowed twenty-four hours to set, to withstand the slow running of water? Not with the velocity there is in that sewer.

14366. What is the fall in that sewer? It is a high velocity.

14367. One in 1,000? No, 1 in 500.

14368. Would that be sufficient to wash away that material if it was good? Yes. It is not merely the wash of the water, but this sewer drains the Eveleigh running yards, and a large quantity of clinker is brought down in the water and rolls over and over in the invert of the sewer, pulverising the rendering and concrete too, and then they get washed away. In my opinion, that was really the cause of damage. Although I may not have said so in my minute, that was in my mind when I recommended that brickwork should be put in. Although the water might have been kept off for twenty-eight days—and certainly it would have been necessary to keep the water off for twenty-eight days to allow the cement to harden—I was afraid that the clinker from the running sheds would have pulverised the cement a second time and that the very same thing would have occurred. On the whole, seeing that the contractors were willing to bear a large proportion of the cost themselves in turning out the water and cutting out the concrete, I considered it was a fair and reasonable concession to make to pay for the brickwork.

14369. Paper 91-3,024 is a letter written by Mr. B. C. Simpson, on 10th December, 1891;—will you read the letter? It is as follows:—

My dear Sir,

113, Phillip-street, Sydney, N.S.W., 10 December, 1891.

Messrs. Carter & Co. have again seen me respecting their claim for compensation on account of the withdrawal of the most profitable portion of their Sewerage Contract No. 72, concerning which claim I wrote to you on the 19th October.

Mr. Piper, of your Department, called on me on the 3rd ultimo, and stated that you agreed with him as to the contractors' right to complete their contract; but, pending this completion, Messrs. Carter & Co. allege that they are being put to continued expense, and desire that a settlement of the question should be arrived at.

They appear to want only what is fair, which I am quite sure you will be willing to give them, and I shall be pleased if I can assist in a satisfactory settlement. I shall be glad to call on you at any time that will be convenient to you.

Yours, &amp;c.,

B. C. SIMPSON.

R. R. P. Hickson, Esq., Engineer-in-Chief for Sewerage, Sydney.

Ask Mr. Simpson to call on Monday at 11 a.m.—R.H., 11/12/91. Mr. Piper. B. C. Simpson, Esq., 11/12/91.

14370. There is no doubt from that letter that the intention of the Department was to convey to Messrs. Carter & Co., as early as December, an intimation that this contract was going on;—was not that so? It appears that Mr. Simpson understood something of the kind from the portion of his letter where he says that



that Mr. Piper stated that Mr. Hickson agreed with him as to the contractors' right to complete their contract. I cannot tell what was in his mind, except that the completion itself was evidently before him. 14371. There is a minute by Mr. Griffith, in connection with Contract 79, making inquiries into Bond and Hudson's tender;—that minute was not included in the Parliamentary return? I cannot say until I see the minute.

J. Davis.  
24 Aug., 1896.

14372. Will you make a memorandum of the minute? Yes.

14373. There is a minute in regard to the same contract by Inspector Wagg, *re* Reid's dismissal;—will you get the minute? Yes.

14374. In Contract 77 there was a claim of £7 paid to Dickson for damage done to his house by blasting, out of petty cash, lately, by your authorisation—was not that so? Not to my knowledge.

14375. Was not that amount paid out of petty cash? Not to my knowledge.

14376. Will you get that minute too? I do not know of any such minute.

14377. The date of the minute is 26th February, 1896; in the 79 portfolio, on 26th August, 1895, there are minutes from yourself and Mr. Griffiths, backwards and forwards, authorising Contract 79A to be let without tender, and ultimately there is a minute, but these papers cannot be found anywhere;—were such papers in existence? Not to my knowledge. I do not remember ever to have had any communication with Mr. Griffiths on the subject.

14378. I would ask you to look up these papers, bearing date 25th August, 1895? I will see if they are in existence.

14379. The papers are in the portfolio, for I made a memo. of them;—if you recollect I asked you on a former occasion about a claim by Arnold for blasting work;—that was paid? I believe it was. It has to be deducted from the contractor. In all these claims the public have the right to sue the Department, and we, on the advice of the Crown Solicitor, have our redress with the contractors.

14380. Have you done that in every case? I believe so in every case. As a matter of fact, very few claims for blasting have been paid by the Department. I think Arnold's is the only one. There is another case which has been dealt with during the last few days. I do not remember the name.

14381. What about Shell's case? He sued the contractors, and the contractors paid him, I presume. We have not paid the contractors.

14382. Have you finally settled the contract? Yes.

14383. There is no chance of the contractors having a claim upon you? The contractors think they have a claim still for that amount of money.

14384. That is not yet settled then? It is not. It is settled, in so far as the claim made by the contractors for a refund of the amount of damage paid was refused by the Department.

14385. Are they demanding payment now? They wrote about five months ago.

14386. In these papers you recommended that it should be paid, according to the minute which was read on the last occasion you were examined? I do not think I recommended it. As far as I remember I thought it was a fair thing.

14387. A reasonable claim? Yes; but I do not think I recommended it.

14388. Referring to Contract No. 79A, in the voucher, which appears in the Parliamentary return on page 372, there is this item: "First advance on difference between lump sum and value of work at schedule rates, £2,000"? I can explain it, still I had nothing to do with the work at that time. It is the difference at that time between the measurements which had been made and the working them out at schedule rates and the lump sum.

14389. Did you make that distinction throughout the certificates to contractors? I do not think so. It was dropped in the end; £12,534 19s. 2d. was paid.

14390. It says, "First advance on difference between lump sum and value of work at schedule rates";—was there another advance made them? That advance of £2,000 was made.

14391. At what date? On 23rd December, 1895.

14392. Was there no advance made before that? That was the first, according to this paper.

14393. Does it not appear in other certificates before this? It might have done so; but it would only be £2,000 in the end.

14394. What gave them a title to be paid on that? As I have already explained, the quantity at schedule rates worked out to a certain amount—£11,563 8s. 6d.; and the lump sum they were entitled to for the work was £12,534 19s. 2d. It seems that Mr. Griffiths and Mr. Darley, at the time the certificate was made out, assessed that the value of work done on the contract up to that date was £13,700, in view of the fact that they were to get ultimately £14,331 1s. 4d. for the whole of the work.

14395. As a matter of fact, they made a substantial profit on that job? I think that £2,000 is the amount. The work when finished, worked out at schedule rates, would have come nearer £14,331 1s. 4d. than £13,500. There would not have been a difference of £2,000 between the contract as worked out at schedule rates and the lump sum.

George Christie recalled and further examined:—

14396. *Mr. Parkes.*] You have prepared a list of the additional papers relating to Contract 79A, which were omitted from the Parliamentary papers? Yes.

G. Christie.  
24 Aug., 1896.

14397. Will you indicate the nature of the papers, which I will ask His Honor to admit as Appendices? Paper 94-1,471 is a letter from Jones and Jones, solicitors, *re* claim of Foster against the Metropolitan Board of Water Supply and Sewerage. That was followed up by 94-1,497, a minute of J. Davis in reference to alleged damage by blasting; paper 94-1,356 is Jones and Jones' preceding letter of 3rd August with reference to Mr. Robert Foster's claim; paper 94-1,497 is a further minute of Mr. Davis on 25th August, 1894, *re* Jones and Jones' correspondence; paper 94-998, dated 12th June, 1894, is a minute from J. W. Boys, Contract 79A, North Sydney, relative to the complaint of workmen not receiving their wages, and Mr. Davis' minute of 12th June, 1894, thereon; paper 94-307 is a letter from Carter & Co. on 1st July, 1895, asking for an advance of £3,000 from the retention money, with further minutes therein; paper 95-830, dated 28th August, 1895, is a minute of T. Griffiths, approving of extension of High-street branch at schedule rates.

14398. These are the main papers relating to Contract 79 which were left out of the Parliamentary return? Yes; there are other papers, but these are papers of an important character which should have been included in the return.

14399.

G. Christie. 14399. In connection with Contract 79, there are certain papers which are omitted from the Parliamentary return? Yes. I think these papers were read at the last sitting of the Commission. There are certain papers in Contract 79A which are in the Parliamentary return, but which have not been read.  
 24 Aug., 1896. 14400. Do you produce the papers relating to Contract 72 which were omitted from the Parliamentary return? I do.

J. Davis recalled and further examined:—

J. Davis. 14401. *Mr. Parkes.*] Is this a letter from Inspector Wagg? Yes.  
 14402. What contract does it refer to? Contract 79.  
 24 Aug., 1896. 14403. Will you read the letter? Yes; it is as follows:—

Sir,  
 Sewerage Works, North Sydney, Contract No. 79, 16/11/93.  
 I beg to report that when filling in No. 8 shaft around the brickwork, some feet high, the workmen were putting in some very large stones with the muck. I told them to throw them on one side. They broke them up instead. Reid, the contractors' manager, told them to put them down as they were. I objected, and he became very abusive and openly defied me. The work also being improperly rammed, I objected to any more being done unless done as I requested. This man openly defies all the Inspectors. I have known an Inspector wishing to go below and the engine-driver hiding in the bush and dodging the Inspector, thus preventing him inspecting the work. The driver, when asked the next day about his conduct, admitted the fact, but said he was acting under instructions. Some measures ought immediately to be taken with this man, who really carries things too far, openly defying the Inspectors, and also tells the workmen to take no notice of us whatever.

J. W. T. Boys, Esq., Resident Engineer.

Yours, &c.,  
 INSPECTOR WAGG.

14404. What did you write upon that letter? I wrote this minute:—

Department of Public Works, Roads and Bridges and Sewerage Branch,  
 Sydney, 18 November, 1893.

MINUTE PAPER.

*Subject:*—Contract No. 79—North Shore—Inspector Wagg's report *re* Reid's conduct.

UPON Mr. Boys handing to me Inspector Wagg's report, I arranged for a meeting with the contractors on the following morning, which took place in the presence of Mr. Boys, and Inspectors Wagg and Fowle.

The contractors admitted that Reid was entirely in the wrong in the course of conduct he had pursued, and stated that they had already rebuked him for it, and would further do so. I gave them to understand that as Reid was acting as their foreman he must at all times be willing to carry out any reasonable request the Inspectors made to him, and unless he did this, if it was only for the purpose of maintaining discipline, he must be removed. But beyond this such conduct as Reid has been guilty of could not for one moment be allowed. The Inspectors must be supported in their endeavours to get the specified quality of work executed on the contract, and if this man Reid does not mend his ways, or if he shows any more insubordination, the matter must be at once reported. Will Mr. Boys kindly note this.

J.D.

Mr. Boys. Noted and returned, 20/11/93. J.W.T.B. Put away.—J.D., 22/11/93.

14405. This man Reid seems to have been somewhat of a nuisance to you all through, does he not? I would not go as far as that, but still he was a man I did not care very much about.

WEDNESDAY, 26 AUGUST, 1896.

Thomas Wright recalled and further examined:—

T. Wright. 14406. *Mr. Parkes.*] Do you desire to make a statement as to what took place yesterday, when an examination was made of the invert of the storm-water sewer on Contract 6i? I do. I do not think the trial was a fair trial. I find by talking to two men (one of them is at the Post Office), who have a great knowledge of this matter, that, if the material was there, in place of taking about an hour and a half it would take about six or eight hours to hunt through these things.  
 26 Aug., 1896.

14407. *His Honor.*] To do what? To put these four holes in. If the quantity of concrete was there, in place of taking an hour and a half, which they took, it would take six or eight hours to bore the four holes they bored yesterday. They commenced them after 11 o'clock and they were done after 1 o'clock, and at the time you were away they did nothing at all.

14408. Did you not go in and sound the depth of the holes? They are not through the concrete yet. You think they are in concrete, but there is no concrete there. When they drove the drill down they kept a piece of metal in front of the drill right through. I know what the bottom is there; it is a nice black, loamy, tough kind of soil. I believe they could go out to-day and get 18 inches of concrete there. I spoke to four men this morning, and one of them says that he cannot put a hole through bluestone in less than three hours. The concrete you saw was as hard as any bluestone. The first hole they put in was 11½ inches, the second was 10½ inches, the third was 9½ inches, the fourth was 9 inches. It runs 3 feet 6 inches. I can drive a hole which any two men in New South Wales can do. If they had spent six or eight hours putting in holes you might suppose the stuff is there; but the stuff is not there. I am confident that it is not. I could see by the way the drill worked that they were keeping stuff in front of the drill and following it down. The hammer was only 2½ lb. or 3 lb. weight. It would hardly make a mark in the concrete at all. There was no room to strike it. One man would have done more than two with a single hammer, because there is not room for the two. With a 7 lb. hammer he would have drilled as quickly as with two. I think that if a piece was cut out by some independent man, or by two men not interested in the matter at all, it would be more satisfactory. If you looked at these men they shook; and when you see a man trembling he is doing something which is not right. I know the drill was not worked right. I have not been in the employ of the Government for twenty years, concreting and cutting holes, without knowing what it is. I know I could not do it. For over twenty years I have been at concrete—at the fortifications at Botany, and at several other places—and I know the dodges they can work with the drills. That stuff all went down in front of the drill.

14409. *Mr. Parkes.*] Do you want a small section cut out? Yes.

14410. It is as easy to cut out a bit as to bore a hole in it? If I had got a hole through you could have gone in underneath and seen it; I am confident that the stuff is not there. The man in the Post-office says it could not be done by them in less than six hours.

14411. Is there anything underneath that concrete? I do not know.

14412. Is there any other bottom? In two places—one near where the office was—I believe they put in some dry coarse sandstone.

14413.

14413. Did they put it in the bottom where you say the thinness is? I do not think so. I think the place I mean is there yet; to the best of my belief it is there. T. Wright.  
26 Aug., 1896.
14414. *His Honor.*] The bottom where you say it was then is black sand? It is all black soil until you get to the office, and there it is white sand.
14415. That is, black sand in the Chinese garden? It is more like black loam; the drill would punch through there. It would be like pushing something through a piece of tough cheese. You would think it was doing a lot of work when it was doing nothing at all.
14416. *Mr. Parkes.*] Do you mean that down the small space of the drill-hole they push metal ahead of it? On the bottom side of the concrete it is rough, and that follows in front of the drill. They can keep that in front of the drill until they go as far as they like.
14417. Is it not possible that you have been mistaken in your idea? I do not know. I cannot see how I could be. Unless there are fairies or witches in New South Wales, I do not know how it could be done in the time. It must be there.
14418. *His Honor.*] Don't you think that you may have mixed up the places? No. There was a man-hole there at one time. I think it was at the bend. I went in one day to the plasterer, and he could not get the invert made straight with a straight edge. He was picking it, and he said to me, "Tom, this is very thin; I am afraid of going through it."
14419. How far from the mouth is the man-hole? I was asking yesterday. I could not find it. It was only put in as a convenience for putting down the stuff, and it was built up again. I do not know where the plasterers are.
14420. *Mr. Davis.*] You were not working the whole of the time at Alexandria? No.
14421. Part of the time you were working at North Shore? Yes.
14422. Does it not occur to you that, while there might have been something wrong in the way you have indicated, it is possible that during your absence at North Shore it might have been put right? It might have been.
14423. That is where the mistake has arisen? It might have been put right, but I firmly believe it was not.
14424. It might have been? I do not think it was; I firmly believe it was not done.
14425. Supposing there was a little mistake made in the levels, and when you came to set the ribs you discovered that mistake—and remember it occurred six years ago—and then you went to North Shore and this thing was put right, as it appeared yesterday was the case, for we found the concrete all right;—do you think it is possible that it might have been done? It could have been done, but I do not believe it was done? At the first hole I was satisfied that the thing was not there when they went down 11½ inches. I know Jim Rogers would not put in 11½ inches for 9 inches. It was not through the metal then. In the last hole it sounded as if it was striking bell metal.
14426. This place where you say some dry sandstone was put in was near the office? Yes.
14427. The office was nowhere near where we put these holes yesterday? No.
14428. So that the dry sandstone which was put in the concrete could not have been what we were drilling in yesterday? No.
14429. Are you satisfied that what we were drilling in was concrete? I am satisfied there was concrete on the top; it was not all through. I am satisfied there was a bit of bluestone on the top.
14430. You did not say anything about this yesterday? I did not think it was any business of mine to speak.
14431. *His Honor.*] You were there with every opportunity to see if the holes were properly done?
14432. *Mr. Carter.*] Did you ever work for two consecutive days at the Alexandria sewer? Oh, yes! and more than that.
14433. You are quite sure that you worked for two consecutive days? Yes. I used to go with Billy Allen.
14434. You are quite sure that you worked there for two days at a stretch? Yes, and more than two days. I was paid there two or three times. I do not think I was away a day from Alexandria until it was nearly finished, when I went to North Shore.
14435. Where did you make the ribs for the job? I made them on the ground.
14436. You did not make them in Webb's yard? I did not make the centre in Webb's yard.
14437. Don't you remember that Mr. Snodgrass and myself marked out the centres for you on a door in Cook & Webb's yard? I think he marked out the centre to take the mould for the two other places, I took the mould, and it was shifted over to Alexandria.

Thomas Williams recalled and further examined:—

14438. *Mr. Parkes.*] Do you recollect ever being shown a letter, stating that it was supposed that the condemned cement had gone from Contract 53 to your contract, and which was supposed to have been written to Mr. Smail, of the Water and Sewerage Board? I remember—I think it was in 1891—getting word to go to the District Engineer's office, and Mr. Cook showed me a letter stating that fifty casks of cement were shifted from the sheds at Waverley to my work. He asked me if I knew anything about it, and I told him no. T. Williams.  
26 Aug., 1896.
14439. That was from Carter & Gummow's job? Yes; I think it was Contract 53.
14440. You said "No, it did not go to you"? Yes.
14441. Did you remonstrate with Mr. Rogers, who was a partner in the firm of Carter, Gummow, & Co.? Yes. I saw him some time afterwards, and I asked him how he came to say that I had taken cement.
14442. What did he say? I think he told me that Mr. Davis happened to go on the job, and asked him what had become of this cement, and he said "Williams has taken it." I said "How did you come to do that, Rogers?" "Well," he said, "I did not know what to tell them." I think he said they put it from the casks into bags on the Sunday.
14443. Did he say it was used on the job? Yes, he told me they put every shovel of it on the job.
14444. You know Mr. Rogers very well? Yes.
14445. You have had lots of communications with him? Yes.
14446. You could believe him as regards what he stated? I think so, because the cement never came to my work. Of course, upon my telling Mr. Cox that I never saw anything of it, he initialled the letter and sent it back.

- T. Williams. 14447. That is the letter from Mr. Davis? The letter from the Construction Department.  
 14448. It was initialled and sent back to them? I think so.  
 26 Aug., 1896. 14449. *Mr. Carter.*] How do you purchase cement—at the merchants' risk or at your own risk? Certainly I have purchased at the merchants' risk.  
 14450. If it does not pass the test the merchants have to take it back at their own expense? I think so.  
 14451. Would you consider then, that it would be any advantage at all to the contractors to use the condemned cement? I do not think so.  
 14452. What reason do you think Mr. Rogers had for saying such a thing? The only reason he could have would be that it would delay the work.  
 14453. You are never short of fifty casks of cement while three or four contracts are going on? That is all I know about it. The documents should be here.  
 14454. *Mr. Parkes.*] I presume that if the contractor happened to have paid for his cement it would have to be used? Oh no! he buys it on the understanding that it has to pass the test.  
 14455. Does not all that depend upon an agreement being made? I do not know. I have always bought on the understanding that it must pass the standard test, and if it did not pass that test they have taken it away.  
 14456. As a matter of fact, it would be possible for a contractor to make arrangements with a seller to deduct a good portion of the cost of that cement? I do not know.  
 14457. Would it not be possible for him to do so? I could not answer that question. Of course, anything is possible.  
 14458. I suppose he who sells the cement would be willing, rather than take it back, to sell it at half-price? I could not answer that question.  
 14459. *His Honor.*] What becomes of the cement, which does not pass the Government test, in the market? Sometimes cement which comes out of a ship will not pass the test, but if you allow it to stand for a few weeks it gets all right.  
 14460. Then it is put to the test again, and it may pass? Sometimes.  
 14461. If cement is all bad, what becomes of it in the market? I do not know.  
 14462. Do you know whether private builders trouble themselves about tests or not? I do not know.  
 14463. *Mr. Carter.*] You know the test is a very severe one? Yes.  
 14464. What will not pass the Sewerage Department, very often, in fact repeatedly, will pass the Railway Department? I have had no experience of the Construction Branch or the Railway Department.  
 14465. You know, as a matter of fact, that the test is a very severe one? Yes, I think so.  
 14466. It is about the severest test in the Colony. I think it is pretty severe.  
 14467. Very often what you or I, or any practical man, would term good cement, is rejected under that test? I cannot tell good cement from bad. I think the test is the only thing to tell its quality, and then I do not think you can always arrive at its quality.

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John Brown sworn and examined :—

- J. Brown. 14468. *Mr. Parkes.*] What is your occupation? I am unemployed at present.  
 26 Aug., 1896. 14469. Were you at any time employed by Carter, Gummow, & Co.? No.  
 14470. Were you never upon the Glebe job? I was Government inspector at the Forest Lodge job.  
 14471. While you were inspector there for the Department, did you ever notice any defective work being done? None whatever.  
 14472. In no case? No.  
 14473. What part of the job were you working on? I was mining inspector.  
 14474. You were not working on the concrete? No; I was only working in the tunnels.  
 14475. Do you know Mr. Thomas Williams, the builder? Yes.  
 14476. Did you have a conversation with him lately? No, not lately.  
 14477. You did not tell him, did you, that the Glebe sewer was worse than Bare Island? No, never.  
 14478. You never said such words to him? No.

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Thomas Williams recalled and further examined :—

- T. Williams. 14479. *Mr. Parkes.*] Do you know John Brown, the last witness who came in here? Yes.  
 26 Aug., 1896. 14480. Have you had a conversation with him lately? Yes; some three or four weeks ago.  
 14481. When he came back from Brisbane? Yes.  
 14482. Did he make any remarks to you concerning the Glebe sewer? No, not then. I had heard them before he went to Brisbane.  
 14483. *His Honor.*] How long ago was that? It was just before last Christmas.  
 14484. *Mr. Parkes.*] What did he say during that conversation? Well, I do not like repeating what has been said.  
 14485. You must give the evidence here, Mr. Williams? He told Mr. Ewing and myself the Glebe job was rottener than Bare Island.  
 14486. *His Honor.*] That is the Glebe sewerage job? Yes.  
 14487. *Mr. Parkes.*] Did he give you any detailed reasons for coming to that conclusion? No, I do not remember anything in particular. I remember his saying that in the presence of Mr. Ewing.  
 14488. Was anyone else there besides Mr. Ewing? No.  
 14489. Did he not give any description of any defective work? I think that was his meaning.  
 14490. *His Honor.*] Did he indicate the particular kind of work? No.  
 14491. *Mr. Parkes.*] Did you make any comment on his remarks? No, I do not think so.  
 14492. It happened in general conversation? Yes.  
 14493. Did Mr. Ewing hear it? Yes.  
 14494. *His Honor.*] How did the conversation arise? We were talking of Mr. Parkes bringing the thing before the House.  
 14495. In what street? In Market-street, near Pitt-street.  
 14496. Did Brown come up when you and Ewing were talking, or did you all meet before this occurred?  
 We were all together before this happened for half an hour. 14497.

14497. Shouting for each other? No, I do not think we are shouting men; it was a general conversation about these charges which Mr. Parkes was bringing up in the House. T. Williams.  
 14498. And out of that this conversation arose? Yes. Of course Mr. Brown has always been a bit bitter to think that he was badly treated by the Department. 26 Aug., 1896.
14499. Was he dismissed then? He seemed to think so.
14500. Had you a former conversation with him in which he mentioned the action of the Department in getting rid of him? I heard him talking about the way he was treated. I cannot remember exactly the conversation.
14501. Had he been out of work then for some time? Yes, he must have been out some time, but I could not tell you how long.
14502. When he said the Glebe contract was worse than Bare Island, did you or Mr. Ewing put any questions to him as to what the nature of the bad work was? I do not think so.
14503. Do you remember what you or Mr. Ewing said to him? I do not recollect.
14504. Did you chaff him, for instance, about it? I suppose there was a bit of chaff going on.
14505. He had been in charge of part of the work on the Glebe contract? I think so.
14506. You knew that he had been in charge of the work? I did not know at the time that he had been in charge of that job.
14507. Not at the time this conversation took place? Not before then.
14508. Did you not say "How do you come to know this?" or make any remark of that kind? No.
14509. You mean to say that you just allowed what he said to pass by? I do not remember what happened.
14510. You have seen him since then? Yes. I saw him after he came back from Brisbane. I think I said that in my previous evidence.
14511. Did any conversation of the same kind then take place? No.
14512. *Mr. Davis.*] Was it said in a jocular tone—were you joking with each other at the time? No; I do not think so.
14513. You took it seriously? It was no business of mine, and I did not take much notice of it.
14514. You took him to mean what he said? I could not help noticing what he said. You do not very often hear such expressions.
14515. *Mr. Parkes.*] Has not that Glebe job been a topic of conversation amongst contractors and Government inspectors for some time? I think that has been referred to a good few times; still I cannot remember any conversation about it in particular.
14516. Have you heard workmen speak about it? No.

John Brown recalled and further examined.

14517. *Mr. Parkes.*] Do you recollect meeting Mr. Thomas Williams, the builder, before you went to Brisbane? I met him many a time on the street. J. Brown.  
 14518. Did you go to Brisbane about Christmas time? No, I went in April last. 26 Aug., 1896.
14519. How long were you on the Glebe job? About 8 months, I suppose, at a rough guess. I could not tell you without looking at my book.
14520. Was any concrete done during the time you were there? I had nothing whatever to do with the concrete.
14521. You had only to inspect the blasting? That is all.
14522. What did the cut run through—shale, rock, or what? Shale—in some places rock and sandstone.
14523. Was it taken out to the full dimensions required by the plans? Yes.
14524. Everywhere? Yes.
14525. In your conversation with Mr. Williams, which you had before you went to Brisbane, did you not make a remark to him that the Glebe sewer was as bad as, or worse than, Bare Island? No, not that I am aware of.
14526. Do you recollect ever meeting him? I have met him many a time.
14527. I mean did you meet him on a special occasion before you went away? No; I saw him every time I came to town.
14528. Did you ever meet him with Mr. Ewing? I have met them many a time together, because they are always together.
14529. Did you then make any remark which might be interpreted to bear that meaning? Not that I am aware of.
14530. Did you ever make any remark about the Glebe sewer at all? If I did I do not remember it.
14531. Can you not recollect whether you did make some remark about the Glebe sewer;—just think awhile? I do not remember.
14532. How did you come to leave the Government employ; did you resign? No; I was suspended.
14533. Why? Mr. Davis discharged me because he found on top of one of the shafts about two buckets of concrete in which he reckoned there was not sufficient cement. That is why I was discharged.
14534. Whose job was that on? O'Neill's job.
14535. What time did that take place? On 5th November—two years ago.
14536. Have you been in the employ of the Government since? No.
14537. Have you any ill-feeling towards them for your dismissal? I have none whatever.
14538. Did you ever make an application to get back? Yes.
14539. Did they entertain it? Yes.
14540. But they did not grant it? I was reinstated twelve months ago.
14541. Where? I have not been employed by the Government. I was reinstated by the Minister, but I have not yet been started.
14542. You are now eligible for reappointment? Yes.
14543. On whose recommendation? I could not say.
14544. *Mr. Davis?* No; Mr. Davis discharged me. I think it was on somebody else's recommendation.
14545. *His Honor.*] Supposing that Mr. Williams has positively sworn that you did state to him in the conversation you had in Market-street, a little time before Christmas last—Mr. Ewing being present—that the work at the Glebe, that is, the sewerage work at the Glebe, was as bad as Bare Island, or worse than Bare Island? I never said so. 14546.

- J. Brown. 14546. Do you say that he has told an untruth? I cannot say; I never said so.  
 14547. Are you sure that you did not say so? I am certain.  
 26 Aug., 1896. 14548. You did not like being dismissed;—did you not think that you had been unfairly treated when you were dismissed on Mr. Davis' recommendation? So I was ill-treated.  
 14549. Was not this rankling in your mind for some time? No.  
 14550. You knew last December that Mr. Parkes had asked certain questions and brought certain matters out in the House? Yes; I saw it in the papers.  
 14551. That formed the subject of conversation, did it not, amongst a good many of the contractors? I suppose it would do so in town.  
 14552. If you met a contractor, or if you met two or three contractors together, this topic of conversation was sure to crop up about that time? Most likely it would.  
 14553. Do you not remember its cropping up on one occasion when Mr. Ewing and Mr. Williams were present? I do not remember the occurrence at all.  
 14554. You positively swear that you did not say anything about Bare Island? I say that I do not remember anything of that kind cropping up.  
 14555. You see Mr. Williams would not be likely to invent Bare Island if it was not mentioned? I am not responsible for what Mr. Williams says.  
 14556. Did you not hear remarks about the nature of the concrete work which had been put into certain parts of that Glebe concrete? You hear lots of remarks.  
 14557. You did hear remarks when you were working on the job? I did not see anything wrong.  
 14558. You did hear remarks? Not that I am aware of on the job.  
 14559. Did you hear anything about sumps having been improperly filled up? No; nothing at all. Perhaps the contractors would not speak to me like that because I was connected with the Government at the time.  
 14560. I mean afterwards? You can hear any amount of things talked about.  
 14561. *Mr. Davis.*] I suppose there has been a great deal of idle talk about these sewerage contracts on all hands? I suppose so.  
 14562. You have heard a good deal of it? I have.  
 14563. Even supposing you cannot recollect having said anything to Williams with reference to the Glebe job, you were on the work at the time, and were in a position to see whether, from your own knowledge, there was anything wrong? I never saw anything wrong.  
 14564. *His Honor.*] Did the other inspectors ever have any conversation with you in which they mentioned that they had suspected or seen anything wrong? No.  
 14565. Nothing at all? No.  
 14566. *Mr. Parkes.*] Did you see any concrete work going in at all? I suppose I have seen concrete work going in; passing up and down the street, I was bound to see that.  
 14567. What do you mean when you say, "passing up and down the street"? Going from one shaft to another on the street.  
 14568. Did you superintend the concreting? No; I had nothing to do with it.  
 14569. *His Honor.*] You knew something about concreting before this? Yes.  
 14570. When you were passing the concrete box as concrete was being mixed, was there anything which struck you about the concrete—about the mixing or the proportions, or the nature of the metal which was put in? No; as I said before, I never saw anything wrong.  
 14571. Nothing wrong at all? No.

Joseph Davis recalled and further examined:—

- J. Davis. 14572. *Mr. Parkes.*] In connection with the Contract 53 at Waverley, and the defective work which was done there, will you read your letters with regard to the dismissal of the inspector? My minute is as follows:—

A SHORT time ago a quantity of bricks were specially made by Messrs. Hart and Gallagher for use on Contract No. 53, but when the first were delivered I found that they were a mixed lot, and only a part of them would do for our work. To save the contractors the expense of carting bricks from Petersham to Waverley which might afterwards be condemned, I arranged with the contractors to have them sorted at the brickyard. I accordingly instructed Inspector Hamilton, a few days ago, to go to Messrs. Hart and Gallagher's yard, and select any bricks, for use in the works, which were up to the required standard. Inspector Hamilton has committed an error of judgment in the bricks he has selected, as I find that the bulk of the bricks delivered are so inferior that they are totally unfit for our work, and I have, therefore, refused them.

Mr. Bagge and I had occasion to visit the work in progress on this contract this afternoon, and we found that, although Inspector Hamilton had nothing whatever to do except to look after one bricklayer and one plasterer, he was allowing the bricklayer to build the arch of the sewer in a most disgraceful manner. The bricks, where they were supposed to be bedded, were hollow, and several courses in the crown were being laid dry, with the intention, it is said, of grouting the joints afterwards. The mortar being used was not, I am satisfied, the specified mixture, and the bricks were those described above.

I am exceedingly grieved to have to report Inspector Hamilton, as I had every reason to believe that he was an industrious, trustworthy man, but I should not be doing my duty if I did not do so.

I have had the brickwork complained of taken down, and I have given instructions that the inferior bricks are not to be used.

Mr. Hamilton entered the Branch about two and a-half years ago at 10s. per day, and has gradually risen until now he is ranked as a First-class Inspector, at 15s. per day.

It must remain for the Engineer-in-Chief to decide what punishment, if any, shall be inflicted, but I am inclined to think that Inspector Hamilton should be suspended, and asked to show cause why he should not be dismissed from the Service. This may appear to be severe punishment; but if these men, who have to be trusted so largely, cannot be depended upon, they are worse than useless.

14573. Will you now read Mr. Bagge's minute? It is as follows:—

In forwarding Mr. Davis' report, with which I fully agree, I am at the same time of opinion that inspectors who in such an unaccountable manner non-fulfil their duties must be considered useless to us—in fact, far worse than useless.

Mr. Hickson then writes:—"I quite concur with Mr. Davis. Write to Mr. Hamilton accordingly."

14574. *His Honor.*] What was the "accordingly";—was he sacked? I do not know, your Honor; perhaps the letter is here.

14575. *Mr. Parkes.*] The letter is not here; the papers have not been supplied in a completed form? Then it must be in Mr. Hickson's letter-book.

14576. *His Honor.*] Do you recollect, Mr. Davis, whether he was dismissed or not? I believe he was; I would not be positive, as I have not seen the papers for six years. 14577.

14577. *Mr. Parkes.*] If you will read your minute of October 31, 1891, it will settle that point? The minute is as follows:—

J. Davis.  
26 Aug., 1896.

THREE months ago Inspector Hamilton's pay was reduced from 15s. to 10s. per day, on account of allowing very defective work to be done in the Waverley and Woollahra branch sewer. He has since been employed at the Glebe supervising brick-work and concrete, under Inspector Gledhill —

14578. That was on Mr. Carter's job again? Yes.

— and there has been no complaint; but, considering the serious way Inspector Hamilton failed to discharge his duties, I cannot recommend for the present that he be reinstated.

Mr. Hickson writes—"Inform that at present I do not see my way to grant Hamilton's request."

14579. Then Mr. Hamilton was not unacquainted with the construction of works? Oh! no; he had had a good deal of experience in India, where he was engaged on public works for some years.

14580. He had been two and a half years in your employ before this happened? So it appears from that letter.

14581. Here is a letter which shows that he did not do this work through ignorance? This is before that time.

14582. It is his first application to the Department;—will you read the letter? The letter, which is addressed to Mr. M'Mordie, is as follows:—

Sir,

No. 2, Tivoli-street, Paddington, Sydney, 30 April, 1889.

I hope you will kindly forgive me troubling you once more.

I am trying very hard to push my tea, and earn an honest living out of it, and if I could get it to take, would do very well; but it has not taken as yet, and although the gentleman from whom I import it has offered to assist me, still I will not be able to hold out, as I am near the end of my resources already, and, in consequence, am obliged to appeal to you once more for another chance in the Public Works Department. If you give it me, you will find I will appreciate it, and for which I shall ever feel thankful.

I am very sorry for not having listened to the advice you gave me four years ago, and remained in the Department. I trust you will kindly look over that, and give me one more chance.

I beg, &c.,

H. M. HAMILTON.

I may say, in explanation of that letter, that Mr. Hamilton in about 1884 or 1885 was in the Department for a short time, resigned, and went back to India; and then, his health or his wife's health breaking down, he returned and did something in the tea way for a time, and finally got back into the Department.

14583. There is no doubt that he was not an inexperienced inspector? Oh dear, no; I would not say that. Just at the time the bad work he did was executed, he seemed to be in a dazed condition. I could not quite make out the man.

14584. *His Honor.*] He had not taken to drink? He was a perfectly sober man. Whether it was through being in a tropical climate for so many years, or whatever it was, he seemed to me to be physically deficient in some way or other.

14585. *Mr. Parkes.*] Where is he now? He is employed in the Department.

14586. Still as an inspector? No.

14587. What is he doing? He is in charge of the cement in the bonds.

14588. Is he still in a dazed condition? We all get times of indisposition.

14589. He would have to have his eyes skinned to be in charge of cement? Yes.

14590. *His Honor.*] Did he come right again? He is all right now. I always felt the man was not altogether to blame. He seemed to me not to know what he was doing at that time.

14591. He was not putting into practice any peculiar Indian experience of his in bricklaying? I do not know.

14592. *Mr. Parkes.*] I wish you now to read the whole of the correspondence in connection with his reinstatement;—will you read the first letter? It is as follows:—

Your No. 91-1,871 of 17 July, 1891.

To R. F. Hickson, Esq., C.E., Engineer-in-Chief for Sewerage,—

Sir,

No. 2, Tivoli-street, Paddington, Sydney, 17 July, 1891.

With reference to the unworkmanlike manner in which Messrs. Baggé and Davis found the arch of the sewer being constructed, I beg to acknowledge that it seemed very careless on my part to allow such work.

The bricks are a little large, and I allowed a little less mortar in the joints in consequence. I am sorry that it escaped my notice that some of the joints were not quite filled, which was an oversight on my part. The bricklayer is a very careful and good workman, and would not, I am certain, willingly do bad work. And as to the grouting-in of three courses in the crown of the arch, I allowed this to be done, as the grout was not so thin as to find its way out of the joints.

With reference to the bricks selected by me not being up to the Departmental standard, I beg to say that I was aware of this, and that out of all I selected I believe I could hardly find one brick that would be; and that I understood the Department was aware that the best of the bricks in Messrs. Hart and Gallagher's yard would not come up to Departmental standard, and that I was to select those nearest to it, which I did—the best I could. The bricks were very dusty with ashes, &c., and it was difficult to distinguish good from bad in that state. Several loads of bricks brought on the works, I feel certain, were not of my selection.

I beg to state that I have always used the utmost care in the construction or repairs of any works I had to look after, and I beg to refer you to Mr. Davis as to my competency to have charge of work.

I further most humbly beg to state that I have not from want of knowledge, nor from carelessness, or any other cause, allowed work to be done and materials to be used contrary to specification further than what I have stated.

Knowing that I am in fault, I most humbly beg you will be so good as to forgive me this time, and I faithfully promise that nothing of the kind shall ever happen again.

Yours, &c.,

H. M. HAMILTON.

14593. Has Mr. Hamilton been reinstated in his former position? No.

14594. He has never been reinstated? Not as a first-class inspector.

14595. Did he ever receive his full salary? No.

14596. What is he now receiving? 7s. or 7s. 6d. per day.

14597. You may as well read all his letters, as you have read one of them? The next letter is as follows:—

To R. F. Hickson, Esq., C.E., Engineer-in-Chief for Sewerage,—

Sir,

3, Tivoli-street, Paddington, Sydney, 22 October, 1891.

I beg to state that I was suspended on the 17th July, 1891, *vide* your letter, No. 91-1,871, of same date, and on the 21st of the same month I was degraded and placed on 10s. a day.

I was sent to Contract No. 65, and told off to look after the bricklayers and plasterers, which I have been doing; and, if you will kindly inquire of the resident engineer and the inspector in charge, you will find that I have paid strict attention to my work, and done it to the entire satisfaction of my superiors.

I



J. Davis.  
26 Aug., 1896.

I beg to say, which you will find from inquiry, that I have always been strictly sober and attentive to my work—working early and late when required of me.  
I sincerely promise you that I will not again give cause for my supervision of work to be found fault with.  
I beg to remark that if I had not met with the accident to my leg on the Macdonaldtown storm-water sewer, I would not have met with the misfortune that caused my suspension, and by which I am a loser, on this date, of £21 15s.  
I trust you will be good enough to consider that I have been sufficiently punished, and kindly reinstate me in my former grade of first-class inspector on 15s. a day.

Yours, &c.,  
H. M. HAMILTON.

14598. Did he make a further application? The next application he made reads as follows:—

R. F. Hickson, Esq., C.E., Engineer-in-Chief for Sewerage,—

Sir,

3, Tivoli-street, Paddington, Sydney, 25 February, 1892.  
With reference to your No. 91/2,668 of 5th November, 1891, I beg to state that it is now over seven months since I was degraded, and that I have worked hard to regain what I lost. May I request you will be so good as to reinstate me in my former position of first-class inspector.

Yours, &c.,  
H. M. HAMILTON.

I cannot recommend this application to the favourable consideration of the Engineer-in-Chief, as I do not think Inspector Hamilton, compared with the other inspectors, is entitled to rank as "first-class."—J.D., 26/2/92. Mr. Baggé. C. H. Ohlfsen-Baggé.—26/2/92. Inform.—R.H., 29/2/92. Mr. Davis.—F.C.P., 29/2/92. Inspector Hamilton informed.—J.D., 2/3/92.

Then, on 23rd February, 1892, he wrote the following letter to myself:—

J. Davis, Esq., C.E., Superintending Engineer of Sewerage,—

Sir,

3, Tivoli-street, Paddington, Sydney, 25 February, 1892.  
I beg to forward, through you, my application to Engineer-in-Chief, to be reinstated to my former position of first-class inspector, which I hope you will give your kind consideration and forward on.

Yours, &c.,  
H. M. HAMILTON.

14599. Will you now read his former applications? They are as follows:—

To J. Davis, Esq., C.E., Sewerage Department, 80, Bathurst-street, Sydney,—

Sir,

No. 2, Tivoli-street, Paddington, Sydney, 6 April, 1889.  
Having heard there is a vacancy for an inspector of works in the Sewerage Department under you, I most respectfully beg to offer myself a candidate for the post.

You may rely upon me that I shall not be wanting in my endeavours to give satisfaction to those under whom I may be placed.

Yours, &c.,  
H. M. HAMILTON.

Mr. Hamilton applied for employment about four weeks ago, through Mr. McMordie, and as there was no vacancy at the time the Engineer-in-Chief ordered his name to be registered. As McKay has been dismissed there will be a vacancy for an Inspector when work is commenced on Contract No. 47, and resumed on Contract No. 42, Paddington, which will probably be in a few days. Mr. Hamilton served under me at Rushcutters' Bay some four years ago, and he was found to be a steady, reliable man.—J. DAVIS, 8/4/89. The Engineer-in-Chief for Sewerage, &c., &c.

Mr. Bennett writes something on that minute. I do not know what it is, but I think it is "resubmit." Then there is a letter on 19th February, 1889? It is addressed to Mr. McMordie in these terms:—

450, Oxford-street, Paddington, 19th February, 1889.

D. McMordie, Esq., C.E., Superintending Engineer, Government Sewerage Works,—

Sir,

I beg most respectfully to offer myself a candidate for employment in the Department under you.  
I shall do my utmost to give satisfaction in whatever post you may place me, and feel very grateful, if you will kindly assist me.

I am in possession of first-class testimonials, and beg to refer you to Mr. A. F. Watson, District Engineer, Bathurst, to whom I am well known.

I beg to remain, Sir,  
Yours obediently,  
H. M. HAMILTON.

I have informed the applicant that there is no vacancy. He was employed in the Department some years ago as an inspector, and resigned. He is a steady man.—D. McM., 20/2/89. Engineer-in-Chief.

Mr. Bennett writes, "Mr. McMordie to see me," and then something follows that; but I do not know what it is. The next document is a memorandum by Mr. McMordie on 18th July, 1885, in these terms:—

INSPECTOR Hamilton has resigned; a sub-inspector will be required to fill his place on brick and concrete work.

On 8th March, 1885, Mr. Watson writes to Mr. McMordie the following letter:—

My dear McMordie,

Bathurst, 8th March, 1885.  
This letter will be handed to you by an old Indian P.W.D. overseer, Mr. H. M. Hamilton, who served under me in Bengal and writes that he has just arrived in this Colony. I have no vacancy in this district, but I thought if you would kindly tell him where to see any of the contractors under you in the drainage works he could then ask them to give him something to do.

Mr. Hamilton had charge of a subdivision with a great number of buildings to look after, from a princely palace to a gaol, and including the fine double-storied barracks at Bahnpore which Sir Hope Grant said, and justly, I think, were the finest buildings of the class in India—

14600. *His Honor.*] It is hardly necessary to read all that letter, as it is simply a recommendation to Mr McMordie? Very well, your Honor. Then there is a letter to Mr. Hamilton which finishes the correspondence.

14601-2. *Mr. Parkes.*] There is no doubt that Mr. Hamilton was a capable man? I believe him to be a fair inspector. He certainly is a very sober, trustworthy, industrious man.

14603. There can be no question that Messrs. Carter & Co. were not imposing upon his ignorance—that they did not trick him to do wrong work? I should not say that. I should say what I said before. That was always my notion about him. I never distrusted him. I felt that he was either mentally or physically incompetent at that particular time.

14604. If bad work was being done at that time, it was being done by imposition? Workmen were certainly taking advantage of Hamilton. There can be no question that they were.

14605. Was it difficult to find out that bad work? It was all in the open. Anyone walking by could see it at a glance.

14606. There was no difficulty in finding it out? No.

14607.

14607. The contractors themselves could see it? If they had been there, certainly. I had no difficulty in finding it out. As soon as I got to the work I noticed it, and I called Mr. Bagge's attention to it.

14608. *Mr. Carter.*] Referring to this supposed defective work, you say that it was quite easy for anyone to see it? Yes. J. Davis.  
26 Aug., 1896.

14609. It was, in fact, a covered sewer built on top of an embankment, and it was open to everyone's inspection? Yes.

14610. So that the contractors, if they knew anything about it, would be running great risk in allowing such work to go on? I should say so. I do not blame the contractors so much. I know what the men are. A man may be a very good workman. If a man is doing something every day in the week, and every week in the year, he sometimes gets careless, and wants bringing up to the mark. The only way to do it is to keep him under proper control.

14611. It was three-ring work? It was two-ring work.

14612. This grouting would occur in the back ring, I suppose? I am not sure whether it was in the first or the second ring. It was on the crown, where they could grout. It was not on the sides, where they could not grout.

14613. Referring to the question of culling of bricks at the brickyard, was not that a concession to the brickmaker, not to the contractors? I do not know. We regarded it as a reasonable thing to do under the circumstances. The bricks which were brought on to the ground—I remember now I see that memorandum—were not up to the standard, and we have a clause in the specification which allows the bricks to be picked, and the unsatisfactory ones are thrown aside to be carted away, and the approved ones to be used in the works. But, seeing it was evident that the kiln of bricks from which these were taken were all mixed together—I do not know whether the brickmaker asked for it or not, I expect he did—I instructed Inspector Hamilton to go to the brick works and get these bricks culled to save the defective ones having to be carted to Woollahra, and then taken away again.

14614. You are aware, I suppose, as a matter of fact, that any loss which accrues through defective bricks being brought on to the ground always falls on the brickmaker? I cannot say that I know it of my own knowledge, except from what I have understood. I understood that contractors generally buy their materials in that way, leaving the supplier to take the risk whether they pass the Government test or not. I do not know of my own knowledge whether that is the case in this particular instance.

14615. *Mr. Parkes.*] If a workman is doing defective work, and he is paid by the day, what benefit does he get from that defective work? I should say from experience, in nine cases out of ten where workmen are discovered to have done defective work they do it simply to save their own bones.

14616. How would it save their own bones? Because they are idle.

14617. But a workman, if he does defective work, saves time? Not always.

14618. If he is doing quick defective work he is cutting his own throat? That may be so in certain cases, but not always.

14619. If he were doing work to ease himself, it would be simply that he might loaf away the time? Yes.

14620. How would he ease himself? In mixing up cement or mortar, for instance.

14621. Will you say in what way? Suppose he does not put the cement into a batch, he has to mix it all the same.

14622. How does he save his bones? In a case like that, unless it would be a question of fetching more cement, it would be clearly to the interest of the contractor.

14623. Supposing the cement is carted to the mixing board, does the labourer gain any benefit? I should say not, if the cement were there to be used.

14624. In mixing concrete does he gain anything, and if he puts in more metal and sand than he ought to do, and less cement, how does he gain there? I do not say that he would.

14625. Can you point out any way where a labourer will save his own bones by doing defective work? Certainly; in dozens of ways.

14626. Will you say one way? I am satisfied that that man Dawson left that hole at North Shore either through malice or idleness. The saving to the contractor is so trifling that it seems to me it must have been that which induced him to leave the hole.

14627. Have you instructed your inspectors to blackball men off Government works who have given evidence before the Commission? I have not spoken to the inspectors about men who are giving evidence here.

14628. Are you aware that the contractors are blackballing all the men because of the inspectors? I have heard nothing whatever about it. No instructions have been issued as far as I know. The inspectors have nothing whatever to do with the men. I should be very sorry to hear that they had anything to do with the workmen except in the way of administering the specifications.

14629. Will you see that as long as a man is not a bad workman he shall be allowed to get employment on Government works irrespective of his giving evidence here or not? I would like you to say precisely what you mean. I am not going to enter into any undertaking.

14630. Will you give us an assurance that men will not be blackballed from the works for giving evidence before this Commission? I certainly will give no instructions one way or the other. I have nothing whatever to do with the matter. It is a matter for the contractors. We have nothing whatever to do with the workmen.

14631. *His Honor.*] As far as filling joints is concerned, what is your experience of bricklayers. Suppose you instruct them to fill all through joints in brickwork perfectly, will they carry out your instructions? They will not. I have always said about bricklayers that their trade consists in doing the hypocrite. They will not properly butter their bricks; and do what you may, if you take up the brickwork, in very likely 50 per cent. of it, although it may be fairly bedded, you will find some part in the hollow of the brick where the mortar is not rubbed home. We have had some trouble, especially in the tunnels, in getting really solid work done. When the tunnels were first started, about twelve years ago, I had lengths of brickwork taken down repeatedly, simply because of the hollow joints. That was the only way in which we could get the work done at all satisfactorily. The men got to know that the joints were examined and raked out after they had finished a length, and that if they were not solid the work would be taken down. That meant that the contractor would be the loser, and that they would be discharged. That is the only way we can get anything like approaching good work done.

- J. Davis.  
26 Aug., 1896.
14632. Is every length of brickwork lining in the tunnel inspected for joints after it is laid? Yes. It is the inspector's duty after the centres are struck, while the brickwork is green, to examine the joints.
14633. How does he do it? If he goes to the work immediately the centre is struck, and the joints are not filled in, it will appear.
14634. Before there is any pointing done? Yes. Sometimes from the difficulty of getting a brick into position a bricklayer cannot properly bed his brick; sometimes he has to put mortar on the brick and put it into position in that way. In these cases the inspector, who is a practical man, endeavours to help the workmen, but where he sees carelessness on the part of the workmen it is his duty to report the matter so that the work can be taken down again. That repeatedly occurs. I know that in my own experience—not more in connection with Carter & Co. than in connection with any other of the contractors—I have had to have chains of concrete taken down after it has been in perhaps a fortnight or three weeks.
14635. Chains of concrete? Chains of concrete are taken out of the tunnel.
14636. What was that for? The concrete did not properly set for some reason or other. Sometimes we have been able to discover the reason, but at other times we have not. Inasmuch as it did not set we had it taken out.
14637. Can you say, supposing the inspectors do their duty fairly well, that all the lining of the tunnels has full joints throughout? Yes, I would say that, because the arch of the sewer is the only place where anything could happen, and in the majority of cases almost 99 per cent. of it would be either  $4\frac{1}{2}$  inch or 9 inch work—probably 90 per cent. of it would be  $4\frac{1}{2}$  inch work. That is very easily inspected. The packing over the arch has always given us the trouble, and if the inspector's back has been turned we find the workmen have been only too ready to take advantage of it.
14638. In relation to the necessity for watertight packing, I understood Mr. Bagge to say that one principal reason why it was necessary to have watertight packing was because of the great uncertainty of having the joints of the brickwork regularly filled;—as to that reason, can you say whether he is right or whether he is mistaken? I think the joints on the whole would be filled. I have examined a good deal of the work after it has been finished, and I find that in the majority of cases the joints have been fairly filled. I take that which we examined six weeks ago at North Shore. Although the bricks were very much radiated—I suppose there was as much as three-fourths of an inch of a wedge on the brick—it was probably three minutes before the man, using a 5-lb. hammer, could drive out one of those bricks. There was nothing behind the brick—indeed, I said to Dawson, "That is solid," but it was hollow all the same. It was simply that the brick had been properly bedded, and the adhesion of the brick to the mortar prevented it from going back.
14639. Did you find in this case that the brick would drive out whole, or did it generally break? In this case it broke.
14640. Showing that the adhesion of the cement was greater than the adhesion of the brick? I was astonished.
14641. *Mr. Parkes.*] Was it an iron hammer he used? Yes; he was belting away at the brick for three minutes before he got it to move.
14642. *His Honor.*] Driving directly on the brick? Yes.
14643. The brick finally broke? It smashed up before it would come.
14644. That would indicate that the adhesion of the mortar to the brick and to itself was greater than the adhesion of the brick to itself? That is the case. As far as the brickwork is concerned I have no difficulty whatever in speaking in the most confident way as to it. As regards the packing, I am not at all surprised to find that there was a hollow at North Shore.
14645. Why do you say that? Because I know the difficulty we have always experienced in getting the tunnels packed. Whether the men believe in it or not I do not know, but the moment the inspector's back was turned, if they had a big hole to fill, they would, if they could, get a bar of concrete across the tunnel, so that the inspector could not see that there was a vacant place behind. For that reason the inspectors used to get bars and push into the concrete and see whether there was not any hollow place.
14646. Did they often bowl the men out in that way? They have in several cases.
14647. It is a common fact that it is one of the most difficult things to get bricklayers to fill joints, especially vertical joints? It is so. They always seem to have an idea that if they could put a little mortar on the arrise of a brick that is all that is required in a vertical joint.
14648. In ordinary brickwork are bricklayers paid by the thousand or by time? The contractors are not allowed to sublet the sewer works.
14649. So that they are paid by time? Yes.
14650. In ordinary building are bricklayers usually paid by time or by the thousand? In most cases by the thousand.
14651. So that it is an object to them to get through their work as quickly as possible in ordinary brick-laying? Yes.
14652. That cultivates, I suppose, the habit of leaving open joints? I think so.
14653. The habit, being cultivated, is so strong that, even though they are paid by time, they will indulge in it? It always appeared to me that it is so.
14654. *Mr. Parkes.*] This is the first time I have heard of bricklayers being paid by the thousand? I do not know. I know that vertical joints in brickwork are nearly always open. Our specification says that the bricks are to be rubbed home, but the difficulty is to get the men to believe that it is necessary. When they do not believe a thing, the first time they have a chance they will take advantage.
14655. *His Honor.*] They seem to be under a rooted impression that vertical joints may be left open? That is my opinion.
14656. They will only go in for filling the bed joints? Yes.

Christian Herman Ohlfsen-Bagge recalled and further examined:—

- C. H. Ohlfsen-Bagge.  
26 Aug., 1896.
14657. *Mr. Parkes.*] You did not know when you were here last time that the contract which Mr. Davis took you out to see was one of Carter & Co.'s contracts? I did not.
14658. But you do know now that it was? I do.
14659. Having had a look at the plan and longitudinal section of Contract 53 on the easel, do you recollect distinctly going out with Mr. Davis to see this work at Contract 53? Yes, we did go out. Mr. Davis.

Davis called upon me—I think it was in the afternoon—and said “You have never seen the arches on this contract; you ought to come out and see them.” I said “All right,” and he took me out. We drove out; and, when we came to these arches, to his horror and astonishment they had collapsed. Several of the arches had come flat down. Pieces of the arches had tumbled out. I took my penknife out of my pocket and scratched, and found that instead of cement mortar being there it was sand. I said “It is no wonder that this thing has tumbled down. Their centerings could not have been watertight, and the moment the water comes out it takes the cement with it.”

C. H.  
Ohlisen-  
Baggé.  
26 Aug., 1896.

14660. Would not that leave a good cement coat on it underneath;—it would not all escape? No; if the centerings are not watertight, when you put concrete on to the centering, the water in the concrete will ooze gradually out and take the fine cement with it and leave a quantity of sand behind. Of course, there is a shadow of cement left in the mortar; but extremely little. It collapsed on its own account.

14661. Are you of opinion that defective work was in the arch? I am of opinion that the work was downright rubbish.

14662. Will you describe from the plan the number of the arches that were broken? It is extremely difficult now to say how many of these arches [pointing to Plan No. 2] tumbled down. There were two or three of these arches gone—there may have been at least three of them defective; there might have been more; I cannot recollect distinctly, but one or two arches had collapsed flat. Large pieces had tumbled out.

14663. Were you the first that discovered that? We came there together and jumped out. Mr. Davis wanted to show me this work as a piece of work which I ought to see, and to our utmost mutual astonishment we found the thing had collapsed through bad work. Mr. Davis was awfully taken aback, and he said to me “I have had one of my best foremen. However this has occurred is a perfect riddle to me—I cannot understand it.” We went along the work, and at the lower end, where the sewer was being built, to his horror he found the brick lining was set in pure sand. Of course the work has been repaired. I knew that he would see to that at once. But I said to him “What a lucky thing that this work did not occur underground, where it might never be seen.”

14664. How much of the brickwork was defective? To the best of my memory I fancy there was a length of about 50 feet or so which was bad. I cannot distinctly recollect how far it was bad; I can only assure you that both of us were horror-struck to see such a piece of work done in open daylight. We were thoroughly astonished. Mr. Davis looked ghastly pale when he saw it. He was wholly taken aback, and no wonder he was.

14665. Did you go to see what the work was like in the tunnels? No, we did not. We examined these arches. Mr. Davis, I think, went to the tunnels, but I do not recollect whether I went there. I do not think I did. We looked at these concrete arches and the continuation of the sewer. Mr. Davis was very much shocked, and he took immediate steps to have the foreman removed and have the work no doubt repaired.

14666. What was the cause of the defect of the packing—was it that the grouting had not been put in, or that sand had been put in without sufficient cement? The cause was either that the contractors built that work on open centerings where the water could escape, or bad concrete had been put into the arching—it was either one or the other. It is very difficult to say which was done, because further on the brick-lining of the sewer was set in pure sand. He took bricks out and said “Good God, it is shocking.” It is pure sand.

14667. Who said that? Mr. Davis. He was thoroughly taken aback.

14668. Did you ever go out with Mr. Davis to see work on any other contract? Yes. He frequently took me out whenever there was anything to be seen. He used to come to me and say “Come out, I want to show you so-and-so.”

14669. Do you recollect ever finding defective work in a similar manner? I recollect—I think it was at Alexandria Park—the sewer was being extended and a new junction had to be built. This sewer carried a tremendous lot of water, and at this junction in order to bring that new upper sewer into it, the invert was built in a kind of ogee form. With sand and road metal coming down there was a tremendous scour on the invert. This invert therefore was to be built with  $4\frac{1}{2}$ -inch brick lining to resist the scour of stones and things coming down. It was a particular piece of work which ought to be done well. We put brick lining in these inverts, because the corporations, when a storm comes on, open the gratings in the streets, and let all the rubbish, stones, and all, come down, which they should not do. Instead of cleaning out the gratings they open them and let everything pass through. You will see large stones coming down with a tremendous velocity and tearing everything to pieces. When Mr. Davis went down to this sewer he said “Are you coming down?” I said “No; I have seen that before.” He went in, and all of a sudden he called out “Mr. Bagge, Mr. Bagge.” I jumped out of the buggy, and I asked “What is the matter?” “Come down here,” he said. I went into this sewer, and this brick lining, which should resist this scour, was set in dry sand. That was a similar case. It was done in broad daylight. He had thought he had a good foreman there. It was a work which had to be done in a most particularly careful manner.

14670. Do you recollect whose contract it was? I do not.

14671. Was it Parry and Farley's job? I could not positively swear whose it was.

14672. Might it have been at Macdonald Park, which is in the same district? It might have been there; it was by a pure accident that we drove past there. He said to me “I must go down and look at this.” I wish to say here that I do not look upon these things as trivial, when I see 50 or 60 feet or more of the sewer built in such a bad manner, and it is just by accident that it is seen. If it had been underground it might not have been seen at all; it might have collapsed in a year's time, and tumbled to pieces. It simply shows what an amount of supervision it takes to prevent these things occurring.

14673. You are of opinion that contractors should not always be trusted? I do not think that contractors should be trusted. They should be supervised, and they should have no chance of doing this; because if the work is of a very important nature, and it collapses, it might do very serious injury. For instance: on the Continent, if a dyke gives way, and it is shown that it was done by carelessness or want of supervision, the engineer can get up to twelve years on the road. These dykes protect valuable lands down below. It is a very serious matter in the case of a dyke.

14674. *His Honor.*] Do they hang the contractor or guillotine him? If any man is seen by a farmer to injure a dyke the farmer is entitled to shoot him. If a large reservoir at the head of a gully is done badly it may be the cause of drowning a lot of people.

14675. *Mr. Parkes.*] I suppose the dykes are built all right? Yes.

C. H.  
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Bagge.

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14676. Are you sure that the cement was bad in this brickwork? I am quite, positively sure, that what I saw had next to no cement in it.

14677. Did you examine any other portion of that sewer? No, we just went across the gully. When we saw the arches in this terrible state we went lower down, and we saw the brick-lining all set in pure sand.

14678. I am referring to the contract at Macdonald Park, did you see any further defective work? No. We simply happened to pass by when Mr. Davis said "Ob, this is that junction; I must go down and have a look at it." He jumped off the buggy and looked at it, because he knew it was a bad place and wanted to see it.

14679. Do you recollect the invert of the sewer in that district having to be taken up and brickwork put in? That was this identical place at Macdonald Park.

14680. Had the invert to be replaced for any distance? As far as I recollect we were building an extension there, and this extension caused this junction to be rebuilt, because the extension came in at a different level. The scour was so tremendous that it washed away the concrete of the first temporary inlet, and, therefore, we decided upon brick-lining this sewer, to protect this invert for a certain length, with 4½-inch lining on edge set in cement.

14681. Was that invert built in that fashion for any distance in the extension of the sewer? It would be built long enough to receive the scour of the water. For instance, if the water comes down in an ogee form like that, it takes a certain distance before it runs quietly at the lower end. Consequently this distance—60 feet, or whatever it was—would be built with brick lining on edge from the top right down. You have to watch and see how far the scour will go. The velocity is continued until dead water comes and banks it back, and it finds its own level. It forms a kind of a wave when it banks back. You must gauge that point where the water runs quietly. It has to be protected.

14682. Do you recollect whether the whole of that brickwork was defective or not? That brickwork was built in sand.

14683. For any length? No, only for the length of that junction.

14684. Is that the only portion you looked at? Yes; we were passing it. I did not intend to go down at all.

14685. Is it your experience, as regards sewer works underground, that contractors will try to get out of putting in the full amount of cement? My experience is that if you do not supervise that work you cannot rely on it. My experience is that they will do you wherever they can; not so much the contractors themselves, but their men are so impregnated with the idea of "doing" you that they cannot get out of it. If you ask a contractor to lend you for private work half-a-dozen of his men, and you pay them tip-top wages, these fellows will do you.

14686. According to this plan, it seems to have been executed in concrete? Yes; that is concrete underneath. I believe the part tinted indigo was washed out; it was the first temporary inlet.

14687. By that plan it seems that the whole of the invert was altered? No; only for a certain distance, as far as I can recollect. It was originally a temporary concrete inlet; then the concrete was washed away, and brick was substituted for the invert of the new junction.

14688. In the contract adjoining that which you are looking at, and which was Carter, Gummow, & Co.'s contract, do you recollect the invert being washed out of that sewer? It might have been, but I cannot recollect that it was.

14689. You cannot recollect whether it came before you? No!

14690. According to this plan it is at Swanston-street, on Contract 75? Yes.

14691. *Mr. Davis.*] Do you remember, when you made the designs for Contract 75, whether it was a brick or concrete ogee you provided for at Swanston-street, the place you have indicated? That I could not tell you, unless I saw the plans. I fancy we put in brick lining afterwards. I fancy there was an alteration in connection with the continuation of the sewers.

14692. Do you remember, as regards the ogee shown on drawing No. 1, Contract 75, whether you showed it originally on the contract drawings? The first junction, to my recollection, was with an existing culvert and built of concrete, and that was thoroughly scoured away. That was why we introduced the brick lining.

14693. The drawing No. 3, showing the brickwork, is the one you speak of showing the brick lining? Yes.

14694. Do you see a dotted line on the plan running down to the ogee? Yes.

14695. Would not that be the invert of the sewer as shown originally? It might have been.

14696. And then, when you altered the ogee and put brickwork in, you flattened it out a bit? Yes; that might have been.

14697. Does that call it to your mind? I think this sewer was originally connected temporarily with an existing culvert and built of concrete.

14698. Do you remember whether the concrete cut away, and brickwork was substituted by day-work? That I do not remember. All I recollect is that we put brickwork in here when the alteration and extension of the sewer took place; we made the junction differently. I am under the impression that this was built in connection with the sewer extension at the time. We came to the conclusion that we would use brick lining. When we made these additions we took advantage of the opportunity to put in brick lining.

14699. You do not remember whether it was done by day labour or by contract? No.

14700. Do you remember on the occasion of your visit to Waverley, when you say we discovered that very defective work, whether at the same time we, as you say, discovered the cracked arches? Yes.

14701. On the same occasion? Yes; you walked along the sewer and said "Good God, they have put in all these bricks in sand."

14702. You would not say I was in the habit of making use of such language as that? Well, Mr. Davis, you were a very strange gentleman as regards the language. You might see a lot, but I am very doubtful whether your way of seeing a thing will lead you much further than my way of seeing it. I believe when we go to the next world I am just as ready as you are, for all I know.

14703. Do you remember a report with reference to the bad brickwork;—do you remember my reporting bad brickwork to you after we went out there? That is very likely. I am sure you would have repaired it instantly.

14704. Do you remember whether I mentioned that these arches had collapsed in that report? These arches were built of concrete, not of brickwork.

14705. Do you remember whether I mentioned the concrete arches having collapsed in the report I wrote as to the brickwork? That I cannot tell you. I do not know whether I have seen your report at all, because most of your reports, unless I saw them quite accidentally, went straight to Mr. Hickson.

14706.

14706. If these arches were cracked as you have described—and it is no trivial matter, as you say, if they did—do you think it would be reasonable that I should mention in the same report this fact in conjunction with the bad brickwork you say we discovered? In the first instance you would not report to me at all, unless it was a miracle. You stood directly under Mr. Hickson. Mr. Hickson took the supervision so clean out of my hands, and you were his assistant in the supervision. You did not write any reports to me; you wrote directly to Mr. Hickson, and if you showed me a report I took it as an accident.

14707. If so serious a failure had occurred as the collapse of three concrete arches, and this failure took place at the same time as the defective brickwork you have called attention to, do you think it would be reasonable if I reported the defective brickwork that I should report the collapse of the arches?—

*His Honor.*] That question is one which anyone could answer. It is an argument.

14708. *Mr. Davis.*] Did you report the collapse of these arches? No; you were the supervising officer. You recollect that three Bagges were wanted. The work was decided on; you and Mr. Hickson were in charge of that work. I had practically nothing to do with it. You took me kindly out for a drive to show me a thing when you wanted to know something.

14709. If you did report on bad brickwork would you be likely to call attention to the collapse of the arches at the same time? I have not reported in the matter.

14710. If you did would you be likely to do so? If I reported on the one I would have reported on the other, most decidedly. What you have done is a different thing.

14711. Are you satisfied from a perusal of the report I have just handed to you that it refers to the defective brickwork at Contract 53, of which you have spoken? It expresses what occurred incorrectly. I must have overlooked it at the time. It says:—"Mr. Bagge and I had occasion to visit the work in progress on this contract this afternoon, and we found that although Inspector Hamilton had nothing whatever to do except to look after one bricklayer and one plasterer, he was allowing the bricklayer to build the arch of the sewer in a most disgraceful manner." This does not refer to the concrete arches at all. It simply refers to the arch of the sewer. You did not report it at all. You simply recommended in this report that a foreman be dismissed on account of bad work done in that sewer. You did not report at all about the concrete arches. You got them repaired. You knew the contractors were at fault, and I have not the slightest doubt that you simply thought in your own mind, "It is no use reporting it; I will have it mended at once at the contractor's cost; they have done bad work and they must put it to rights again"; but the brickwork in the sewer being set in sand—you used as a sufficient reason to recommend the man's dismissal.

14712. Did the report pass through you? It did. That was my minute.

14713. Did you say, when forwarding it to the Engineer-in-Chief, "I fully agree with Mr. Davis' report"? I say here—"In forwarding Mr. Davis' report, with which I fully agree, I am at the same time of opinion that inspectors who in such an unaccountable manner nonfulfil their duties must be considered useless to us—in fact far worse than useless." It is perfectly correct in one sense, but it simply deals with the sewer. It leaves out the arches. It never touched on the arches. It has nothing at all to do with the arches. If you had written another report about the arches it would have been a different thing. That report and my minute are quite correct, but they refer only to the sewer and the inspector's misconduct.

14714. Don't you think, Mr. Bagge, it would be like you when forwarding this report to the Engineer-in-Chief to call attention to further alleged defective work? No. You were very shrewd in these matters, you know. You knew that I would not do anything like that which would throw a slur on your character. You would hide it in the most clever and delicate manner, Mr. Davis. You know the contractor had to do these arches over again. It was in your power simply to say "Take them down and rebuild them," and no doubt you did. That work was thoroughly bad work. There was not a speck of cement in that stuff, for I stuck my penknife into it and scratched it. You were very shrewd, sir; I know you too well.

14715. *Mr. Carter.*] If the work in Double Bay was so horribly bad, why were not some steps taken to punish the contractors;—why were they not debarred from tendering for six or twelve months? I had nothing whatever to do with that. I simply state a certain thing. Mr. Davis took me out to show me these arches. We only came to see these arches, and to our astonishment we found them thoroughly bad.

14716. Considering this work was so bad, why have you repeatedly spoken, if I may term it, so very highly of the integrity and business-like way in which Carter & Co., and Carter, Gummow, & Co., have carried out their contracts—in view of this language you state that it was so horribly bad that it collapsed? I simply spoke about these arches, which were thoroughly bad, and that has nothing to do with any other traits of your character.

14717. If we did wrong in one case you should remember it? It has nothing to do with it. Mr. Gummow asked me one day about that outlet chamber at Bondi Sewer. It was a good piece of work, and I told him so. I know Mr. Gummow is a very clever fellow; and I know Mr. Snodgrass is a very clever fellow; but I know if you do not look after the work it is your own fault. That is my feeling, but it does not detract from your cleverness or your partner's cleverness.

14718. I spoke of integrity? I have not used the word integrity.

14719. You have many a time to me personally? I have not seen it then.

14720. Do not you remember saying such a thing to me? I do not remember saying such a thing to you, to the best of my recollection; I always considered yours a good firm; but at the same time I would consider any engineer who would trust any firm of contractors without doing his duty and carefully supervising the work a tremendous fool.

14721. Regarding Mr. Davis' report, do you think your memory of the facts that occurred then is as good after a lapse of five years as it was at the time? When I am taken out of my office to a special exhibition of a nice piece of work, and instead of seeing this nice piece of work we see a dead collapse, and both of us are thoroughly astonished, I never forget a thing like that.

14722. You did not put it in the report at the time? I had nothing at all to do with the report. I did not report on these matters at all. Mr. Davis wanted to dismiss or punish this man for not doing his duty. He did not report on the arches at all. He knew you had to rebuild them. There was bad work, and you could not deny it. It was simply a matter of form with him. But, as regards the brickwork, he must give an excuse to the chief to get rid of the man who allowed bad work to be done. That is why he referred to that sewer, and that is why he did not refer to the arches.

14723. Are you sure the arches ever collapsed? Yes; they flopped down. They were as flat as a pancake. Large pieces tumbled out. There was no mortar in it; there was sand in it. Whoever built them I do not know at this moment.

14724.

C. H.  
Ohlfsen-  
Bagge.  
26 Aug., 1896.



- C. H. Ohlfsen-Bagge.  
26 Aug., 1896.
14724. If Mr. Davis omitted to report these arches, don't you think it was your duty to do so? No; it was not. They appointed three Bagges—it was done by either Mr. Barling or Mr. Hickson—and they got these three Bagges and one of them to supervise their work under the personal supervision of Mr. Hickson. I consider that third Bagge was their own doing, and they are responsible for it. They had their three Bagges. If they had the old Bagge by himself it would not have occurred.
14725. *Mr. Parkes.*] Have you any recollection of any report being sent in by Mr. Davis other than that letter? Unless the matter was referred to me a good number of these reports I would never see. They would never come to me at all. He speaks about the bricks, but he does not speak about the arches at all.
14726. Do you recollect whether these arches were changed from concrete to brick? I have not the slightest idea. I have not seen the work since then.

Mr. Joseph Davis recalled and further examined:—

- J. Davis.  
26 Aug., 1896.
14727. *Mr. Parkes.*] Are these arches on Contract 53 constructed at the present time of brick or concrete? Concrete.
14728. Is it a fact that one or more of them were taken down and rebuilt? It is absolutely false.
14729. They were not taken down and rebuilt? No.
14730. Were they repaired? I think they were to the extent I said in my previous evidence. A crack occurred at the southern end of the aqueduct, if you can call it an aqueduct, simply through the first part of the work being carried out some months, unavoidably, before the tunnel was lined and the concrete joined to the aqueduct.
14731. Did Mr. Bagge complain to you out on the site about the material in the arches? Mr. Bagge is entirely mistaken.
14732. Did he complain to you about the material in the arches? I would not pretend to say what Mr. Bagge might have said at the time. I say absolutely that Mr. Bagge is entirely in error as to these arches.
14733. Did you and Mr. Bagge look at the arches? I am not sure that the arches were turned at the time that brickwork was condemned.
14734. Did you at any period go with Mr. Bagge to see the arches? I might have done so. I was frequently out with him—almost every week; sometimes two or three times a week.
14735. Were you out more than once at these points with him? Probably.
14736. Will you swear that you were not out there more than once with him? I think we were out there several times.
14737. Did he at any time show you that there was bad material in the arches? I do not see how he could.
14738. Did he? You are asking me to say—
14739. A man's memory is not as defective as that; you can easily say whether he did or not? To the best of my recollection, no.
14740. Did he ever stick his penknife into the arches? To the best of my belief, no, when I was present.
14741. He never said a word to you about the defective arches? Not to the best of my belief.
14742. *Mr. Carter.*] As a matter of fact, were the arches ever defective? Not to my knowledge, unless you can regard the crack I mentioned as a defect. There was a defect at the culvert, and I believe Mr. Bagge went to look at that with me. The only explanation I can give of the evidence which he gave this morning, and previously, is that he has in some way or other confused the culvert in his mind with the arches. To me it is unaccountable, that he could have said what he has said this morning.
14743. *His Honor.*] What is your recollection about the ogee invert of that sewer? When the contract was let the ogee was shown on the design in concrete, and very steep. It was finished and rendered, but a storm came on and a large quantity of ashes and clinkers were brought down from the Eveleigh sheds. That scoured to a very great extent the ogee away, left holes all the way down the ogee, and the invert of the sewer, probably from 4 to 6 inches deep. It then became a question what would be the best to be done. The work had not been taken over, but it had been finished by the contractors, and finished satisfactorily. Mr. Bagge took the matter into consideration, and then prepared another design, flattening the ogee, and saying that vitrified bricks were to be put in for a certain distance in the invert of the sewer and above and below the ogee. The concrete had to be cut away. In some places it was cut right away below the invert of the ogee, and when this was done the brickwork was inserted. That brickwork and all the alteration in connection with the ogee was done by day labour, to the best of my recollection; certainly it was no part whatever of the contract.
14744. Do you remember the occasion Mr. Bagge speaks of when you found, as he says, that these bricks instead of being laid in cement mortar had been bedded in sand? Since Mr. Bagge has been speaking this morning, I have got some idea that something of the kind did occur, but it has not taken any very definite shape in my mind. It is possible that while the brickwork was being done a storm would come on, and if it did come before the compo. in between the bricks had time to set, the effect would certainly be the washing away of the cement; but otherwise I do not see any reason for supposing that it was the intention to do bad work, because, as I have already said, to the best of my recollection the work was carried out by day labour, and the materials used were paid for by the Department.
14745. *Mr. Parkes.*] Surely that does not require to be a matter to the best of your recollection;—you must remember whether it was so or not? You must bear in mind that a number of these things were going on at the same time, and I would not like to swear by my memory always.
14746. The matter of being paid by day labour or by the contractors could not escape your mind? I do not know that, when you are carrying on £200,000 or £300,000 worth of work in the year.
14747. *His Honor.*] Can you fix the date of the inspection? No.
14748. Do you not keep a diary? If I look up the diary I may be able to fix the date in that way.
14749. You have kept a diary on all these jobs? A journal.
14750. Have you looked over the journal for the purpose of discovering what took place on the occasion Mr. Bagge speaks of in Contract 53, at Waverley? Yes; I did. The papers which have been put in this morning were referred to as giving an explanation of what occurred.
14751. As to the other one, can you look it up in your diary? I will see what occurred. 14752.



14752. If you can fix the date, the weather at that time might give some clue to it? I have given certainly the best explanation I can give. J. Davis.  
26 Aug., 1896.

14753. *Mr. Parkes.*] You can give us the accounts of the day labour or the contract. It would settle that point in no time. You would not have your vouchers? I can settle that by referring to the books.

Christian Herman Ohlfsen-Bagge recalled and further examined:—

14754. *Mr. Parkes.*] Mr. Davis says you are entirely in error; that you did not find defective work in the arches;—is that so? I simply assure you that I have not a shadow of doubt about these arches being built thoroughly bad. I stuck my penknife into them. I showed Mr. Davis that there was no mortar in it. The sand simply rolled out. They were that open that they tumbled down. The bad brickwork was an after consideration. C. H. Ohlfsen-Bagge.  
26 Aug., 1896.

14755. *His Honor.*] What became of the wreckage of these arches? That I cannot tell. Mr. Davis would have it removed and put to rights again at once.

14756. *Mr. Parkes.*] Do you mean that they were big particles or just the arrises broken off the arches? One or two of the arches, I recollect, had gone flat down. A large lump, three or four feet, dropped down clean out of one arch.

FRIDAY, 28 AUGUST, 1896.

Edward Hungerford recalled and further examined:—

14757. *Mr. Parkes.*] In your previous examination with reference to Shea's Creek you undertook to get some information as to the details of the claim made by Messrs. McNamara & Co. on the Government in connection with Contract 72; have you seen the Crown Solicitor? I could not see him, but I telephoned up to his office and received this reply by telephone—that the action was brought against the Department in connection with the Harbours and Rivers Branch for diverting a channel out of its natural course; that the defence was that the Department simply restored the channel into its original course; that the jury found for Mr. McNamara; that the verdict was £3,000; and that the plaintiff's costs amounted to £1,057 2s. 11d., and the defendant's costs to £1,807 18s. 6d. E. Hungerford.  
28 Aug., 1896.

14758. What is the total cost of that claim? As far as the Crown Solicitor's people are concerned, £5,865. The verdict was £3,000; the plaintiff's costs, £1,057 2s. 11d.; and the defendant's costs, £1,807 18s. 6d. Then £320 was paid into Court as a deposit, and that has been repaid to the Treasury.

14759. What is the full total? £6,185 1s. 5d.

14760. Was that the amount you stated to the Commission the other day? Very nearly; but of course there was some expenditure by the Harbours and Rivers Branch which is included in the former return.

Joseph Davis recalled and further examined:—

14761. *Mr. Parkes.*] Will this general plan of the sewerage show the location of Contract 72? Yes. J. Davis.  
28 Aug., 1896.

14762. Will you point it out to His Honor? The concrete portion of the sewer extends from Munni-street, in Erskineville, formerly Macdonaldtown, to the swamp, originally Shea's Creek, but now the site of the Shea's Creek canal. The original channel extends from the last-mentioned point to within about 20 chains of Ricketty-street.

14763. Is that the earth channel forming an outlet to Contract 72? Yes.

14764. Does it run parallel with the Shea's Creek ship canal? In the centre of it. At the time the channel was cut the canal only came up to between McNamara's works and Ricketty-street. Now the canal has been extended up beyond the outlet of the concrete channel which was constructed in Contract 72.

14765. It has swallowed up your smaller channel? Yes; the excavation which was done in Contract 72 formed part of the excavation for Shea's Creek canal.

14766. Not for the whole width? No.

14767. *His Honor.*] I notice that the levels are different;—how do they join now? The levels are different. At present there is no junction. Your Honor may have observed the other day that there was a temporary channel running down on the west side of the canal, and into that small channel the concrete channel discharges. Ultimately it will discharge into the canal.

14768. But does this small channel end off and spread out? It goes into the canal finally, but at present the channel is there to carry away all the drainage to enable the canal to be excavated.

14769. Where does this small channel discharge? I could not say positively; I think it comes out below Ricketty-street. All the drainage from the swamp and high lands above is at present collected in this temporary drain, and discharged below the work which is in progress in the canal.

14770. To keep the canal as dry as possible? Yes.

14771. This drain also takes the drainage from above? Yes. It takes all the drainage above the canal, and all the drainage from Surry Hills.

14772. Where does it head? It goes up as far as Paddington Town Hall.

14773. Is it a storm-water sewer? No.

14774. I mean, does this open cut extend above the junction? Yes; it simply goes above the head of the canal.

14775. Some distance up? About 20 chains above the present outlet of Contract 72.

14776. Where did Contract 72 begin originally at the bottom—was the end of the concrete work the starting-point? Yes; but, to give a proper outlet to that, it was necessary to cut an earth channel 50 chains long, so that anything might be drained away. The channel was cut on the site of the proposed canal, and the original channel has now become a part of the canal itself.

14777. The line of the canal is some distance away from the original channel? The concrete channel will discharge into the canal when they are ready for it.

14778. That is when the whole width is cut? Yes.

14779. If I remember aright, the cutting of the canal passes this point, and reaches further up? About 20 chains further north than the present outlet of the concrete channel.

14780. The explanation is that the whole width is not cut? It is not finished off yet. 14781.

- J. Davis. 14781. The east side is battered down and finished? Yes; they are working on the other side. While that is being done, the water is excluded in the way I have described.
- 28 Aug., 1896. 14782. Mr. Weedon's letter, which was printed at page 450 of the evidence, is headed "Contract No. 72—Silt in open outlet from storm-water channel";—what is he alluding to when he speaks of the open outlet in the storm-water channel? He refers to the earth channel running down towards Ricketty-street. The first work which was done on Contract 72 was the cutting of that earth channel.
14783. That did form part of Contract 72? Yes; it was paid for under Contract 72. After that had been finished some little time, and the work was proceeding above in the concrete channel, a very heavy storm came on. The woolwashing people had a series of dams right up Shea's Creek into Surry Hills, but they had no weirs. When their dams get full they open the sluices and pass it on to their neighbours; and so it comes on until there is such an accumulation of water that the channel which used to carry the water from the head of the swamp round to MacNamara's could not carry it, and the water would overflow into the swamp. That had the effect of scouring out large quantities of earth above the point where the concrete channel discharges, or did discharge, into the earth channel. The effect of that was to deposit this earth in the earth channel. That is what Mr. Weedon refers to.
14784. Was that a sudden remarkable rainstorm? It was very heavy; but I think what did the damage was the system which these men had of opening their flood-gates.
14785. Clearing out their silt whenever they get a chance? Yes. It is simply like the bursting of a dam in a way. The water comes down on to the swamp at such a rate that no channel would take it.
14786. Each man clears out his rubbish—that is, the silt deposited in the bottom of his dam—on to the land down below? Yes; that is what caused the damage.
14787. What is the "old work" which Mr. Weedon alludes to in his letter? I think the gist of his minute is that, in the first 20 chains of earth channel below where the concrete channel joins the earth channel, the silt to which I have referred as having been washed out after a storm was deposited then. Below the 20 chains the channel was as it had been excavated, and no silt had been deposited—that is to say, that the storm had no effect upon it.
14788. The original bottom was 21 feet wide at the cutting? That was the width of the original channel which was cut along the centre of Shea's Creek canal.
14789. It is not very clear from this letter? I should be very glad to make it clear to your Honor.
14790. Mr. Weedon says: "The top of the concrete channel is 12 ft. 3 in.";—that is the end of the concrete channel? Yes; and the bottom width of the outlet.
14791. "And the bottom width of the outlet, as shown in red, is 12 feet";—that is the same outlet, I suppose? The bottom of the outlet after the silt had been deposited was 12 feet. It had formerly been 21 feet.
14792. Had the sides fallen in? I think it was wholly due to the depositing of silt which had been washed out of the swamp above the point I have indicated.
14793. That would reduce the depth, but how could it reduce the width? In this way: the velocity in the centre of the earth channel would be considerably more than on the sides, and the tendency of that would be to cause the silt to deposit in the angles at the bottom of the channel; where the slopes meet the bottom of the channel: the effect would be to deposit the earth there, and that would reduce the width—in fact I know that is what did occur.
14794. Mr. Weedon goes on to say: "From which point the full width of the old work, as it now stands, will be cleared out";—by the old work he meant the channel as it had originally been cut? That is so.
14795. Not old except in the sense of original work? Yes.
14796. "The original bottom was 21 feet wide"? Does that mean the bottom of the channel as originally cut? Yes. I can quite see that that letter of Mr. Weedon's presupposes knowledge which an ordinary reader would not have.
14797. He says: "The total quantity of excavation by the cross-section, allowing an average area of 6'32 square feet"; that is the area of the section of the siltage I suppose? Yes. When the cross-sections were taken, after the silt was deposited, it was found that that quantity of silt was to be removed in order to restore the channel to 21 feet wide in the bottom with the slopes as they were originally.
14798. *Mr. Parkes.*] With reference to Contract 53, did you not have to dismiss another inspector besides Mr. Hamilton on that work? Yes. There was some trouble with another inspector before that. I am not sure whether he was dismissed, but there was some trouble over him. He was either disrated or dismissed.
14799. What was the nature of the trouble? I do not know how it came to my knowledge. As far as I remember, he had been taking "nips" with the contractor—a man named Rogers.
14800. Did he not omit to get the packing put in that contract properly? That was another case. When I referred to the "nipping," I referred to a man named McDonnell.
14801. Was there not another man who got into trouble? There was another case, but I cannot remember his name.
14802. Was his name Vincent? Yes.
14803. Was he dismissed? He was disrated.
14804. What was he disrated for? The sum and substance of it is, that the bricklayer deceived him. Vincent ought to have been sharper, but the bricklayer certainly deceived him. The bricklayer allowed Vincent to suppose that he was going to pack a length of arch after lunch time. Vincent went away to get his lunch and went on to the surface. During the lunch time another officer went through the tunnel and examined the packing, and found that the bricklayer or a labourer had left a hollow space. Then Vincent, of course, was called to account for this thing, and that is the way he explained it. He was evidently taken advantage of.
14805. Do you recollect what size that space was? I could not tell you now.
14806. Was it 9 feet? It is possible. I could not tell you now; I can only tell you what I remember of the case.
14807. Do you remember the name of that bricklayer? No.
14808. Was his name Rydleberg? I believe it was. He was discharged.
14809. Has he not been working on Carter, Gummow, & Co.'s works since then? Yes; he was discharged for twelve months, and then Carter & Co. wrote asking that, as he had been punished to that extent, he might be allowed to work. It was considered that the punishment meted out to him was sufficient, and he was brought back again. He was an exceptionally good bricklayer, but evidently too anxious to get on with work to do it properly.

William Allen sworn and examined :—

14810. *Mr. Parkes.*] What is your occupation—a labourer? Yes.  
 14811. Where are you working now? I am working for Mr. McSweeney, at Stanmore.  
 14812. Did you work for the firm of Carter, Gummow, & Co.? Yes.  
 14813. On what contracts did you work? I worked at Waverley, North Shore, and Alexandria.  
 14814. Did you ever work on the Glebe contract? No.  
 14815. What were you doing at Waverley? I was concreting for a bit.  
 14816. What was the class of concrete put in there? Sandstone concrete, bluestone concrete.  
 14817. Was it mixed up to the full proportions? Yes.  
 14818. In every case? Yes, as far as I know.  
 14819. Did they put in the full quantity of cement? Yes.  
 14820. Did they pack all the drums over the arch with concrete? I know nothing about that.  
 14821. You were only mixing? I was in the invert.  
 14822. Putting it in? In the bottom.  
 14823. You were not mixing it up? I was ganger there at that time.  
 14824. You saw it going in? Yes.  
 14825. Did you see it mixed up? Yes; I have seen it mixed up.  
 14826. Was it all properly mixed up? Yes.  
 14827. What other work did you say you were employed at? I have worked at North Shore.  
 14828. Did you have some trouble with Carter, Gummow, & Co.? No.  
 14829. They sent you to North Shore to work? They sent me there to work.  
 14830. Was it Contract 79 or Contract 79A? I could not say.  
 14831. Was it the first contract they did? I worked on both.  
 14832. Did you see any defective concrete going in there? No.  
 14833. Was the packing all properly done on those jobs? Yes; what I did was.  
 14834. What portions did you work in? In different parts of it.  
 14835. Do you recollect what particular portions? I worked between No. 1 and No. 2 of the first contract.  
 14836. Did you work on the second contract? Not down below; only at driving.  
 14837. You never worked at the Glebe at all? No.  
 14838. Did you work on the Alexandria contract? Yes.  
 14839. Was that all properly done? Yes.  
 14840. All the concrete was properly done as far as you know? Yes.

W. Allen.  
 28 Aug., 1896.

Edward Moore sworn and examined :—

14841. *Mr. Parkes.*] Are you a labourer? Yes.  
 14842. Did you ever work at Contract 118—that is one of Carter and Gummow's contracts at Johnstone's Creek? Yes.  
 14843. What were you doing there? I was turning concrete over.  
 14844. Did you see the mixing of the concrete? Most of it.  
 14845. Was it mixed of full proportions? Yes.  
 14846. What was the cement used there—was it bag cement or cask cement? Both.  
 14847. To any extent, how much cask cement was used? I cannot remember.  
 14848. How much bag cement was used? I could not tell you. Sometimes we might have a day on each.  
 14849. What time were you working at concrete? From July to about December on both jobs on and off. I think I was two months at Johnstone's Creek.  
 14850. Were you working there after December? No.  
 14851. Were you mixing concrete in December? No; I was on the Monier job.  
 14852. Were you mixing concrete there? Yes.  
 14853. Was bag cement used there? No; cask cement.  
 14854. Were the casks all complete when they came to the cement board? Yes.  
 14855. You left in December? Yes.  
 14856. You did not go back there? No.  
 14857. Do you know whether the full complement of cement was put in the concrete which went into the Johnstone's Creek channel? As far as I know while I was there.  
 14858. Did you see it mixed? I was one of the mixers. I had nothing to do with putting the cement on. There were men there for doing that.  
 14859. How did they gauge the various material? 20 feet of sandstone, 8 feet of sand, and 4 feet of cement.  
 14860. That is the way they gauged them? Yes.  
 14861. Had you a gauge-box to do that in? Yes.  
 14862. When the bag cement was used did it come to you in casks or in bags? In bags.  
 14863. You broke the bags? We cut them.  
 14864. You cut them on the slope? I did not.  
 14865. But the foreman would? No.  
 14866. How many bags would he cut on each heap of material? Three.  
 14867. Would you see the amount of stone put in? I had my own work to look after. I did not have much time to look around at others.  
 14868. How long did you work at the concrete? About two months, I think, at Johnstone's Creek.  
 14869. Constantly? Yes; but not all the time at concreting. I was running the muck work too.  
 14870. Could you tell us the names of some men who worked with you? I could not give you their names. I only knew them as Jim or Tom, or the like of that.  
 14871. You did not know their surnames? I knew some of them who were on the board.  
 14872. Do you know any man who has left since January who worked with you? No; I have not seen any of them since I left.  
 14873. Was it the pier work you were doing on the Monier contract? The abutments.  
 14874. Not the arches but only the abutments? Yes.

E. Moore.  
 28 Aug., 1896.

14875.

- E. Moore.  
28 Aug., 1896.
14875. Do you recollect what sand was used? No.  
14876. Was it crushed sandstone? I do not think so. I think it was carted. The sandstone was crushed.  
14877. Do you know where it was carted from? I could not tell you.  
14878. Was it crushed by a crusher on the works? No; not the sand.  
14879. What became of the sand that came out of the crusher—was that never used? I think it was used on the stormwater channel.  
14880. It was not used on the other job? No.  
14881. Where did the white metal come from which went into the crusher? I believe it came from Pymont.  
14882. Did any come out of the tunnels? Not to my knowledge.  
14883. You did not see any come from the tunnels? No.  
14884. It came from Pymont? I believe it did.  
14885. Did any of it come from Annandale? I could not say. I believe there were quarries there. I could not tell you whether it come from there.  
14886. You do not know really whether it did all come from Pymont? No.  
14887. *Mr. Carter.*] You do not bother yourself about where the material comes from particularly? No.  
14888. It is your business to work it up? Yes; as long as I get my money on Saturday I am satisfied.  
14889. You haven't much time to be looking around and wondering where the stuff is coming from? It is not my business to do that. There are men paid for doing that.

Varney Parkes sworn and examined:—

- V. Parkes.  
28 Aug., 1896.
14890. *His Honor.*] You desire to make a statement to the Commission? I do. In June, I think, 1891, I was a candidate for the electorate of East Sydney in the Legislative Assembly; and during that contest the city was in a somewhat disturbed state, as far as the property owners were concerned, as to the inroads made upon properties by the Water and Sewerage Board. The sewerage system of the city was being constructed, and a great number of the sewers had been completed. There were constant comments amongst the people with whom I had to do—electors and workmen, contractors—as to the defective method in which the sewers were being put down. That was the first intimation I received of such information as I afterwards obtained. I did not pay a great deal of attention to it at the time; but I came to the conclusion that to put an end to these rumours, even supposing they were not true, the public works should be managed on a different scope altogether. When I was elected, the late Sir Henry Parkes, my father, sent for me and said that he was taking into consideration the matter of appointing me as Minister for Works, Mr. Bruce Smith going to the Treasury. I then mentioned these rumours I had heard of defective and costly works, and told him that anybody who was Minister for Works must put on a new footing altogether the Department, that he must establish a Board of Works and dismiss the officers of the Department, and only retain the heads as advisers and as consulting engineers, with a small staff, the Board being responsible to the Treasury, to manage the whole of the outlays on public works. Mr. J. H. Young became the Minister. After that, I followed up the information which I had obtained. I had in my employment an inspector of works whose name was Webster, and it was he who gave me this information. He said that Mr. Hickson, when he was employed at Adelaide, as an officer in charge of public works, had had misfortunes with those works which had put the Government of South Australia to a considerable loss of money. I made further inquiries about this matter, and I found that Mr. Hickson's works had come to grief in that colony. Then I became a little suspicious, seeing that he was controlling the sewerage works, whether the works were being constructed properly. After that I spoke to various Members of Parliament, Mr. Carruthers being one of them, about the establishment of such a Board of Works. We then tried to establish a society called the National Works Economic Society, the object of which was to govern the expenditure of public money, and to build up the basis of a National Board of Works. That brought about me certain contractors who gave me certain information. In every case I made an effort to find out the truth of their information. Of course, I found out that a good deal of it was false, and that some of it was true. I gave notice of a motion in the House during 1893 or the early part of 1894 to this effect, "That a Select Committee be appointed to inquire into the methods of contracting in connection with the letting of works by the Public Works Department. It was pointed out to me by the members of the Reid Administration that this really would be a vote of censure on the Government, so that my motion never saw the light of day beyond the preliminary notice. But I had a sort of indefinite promise from Mr. Reid, on consultation with him, that a Bill to establish a Board of Works would be considered. After the election of 1894, I gave notice of another motion dealing more particularly with the matter, and asking for a Select Committee to inquire into the constitution of the Public Works Department with the object of making reforms. The reason why I moved these motions was that the comments in the city amongst the builders and contractors were very serious with regard to this method of contracting by schedule—of obtaining tenders from these schedules; and that report about the schedules of Messrs. Carter, Gummow, & Co., was about the city certainly as early as the early part of 1894. All this information I did not act upon or make any very great efforts to find out the truth of until, in October, 1895, contractors Williams and Maddison called upon me and laid before me the whole of these statements which have appeared in my speeches. They told me in the first place that Mr. Maddison had been a member of the firm of Carter, Gummow, & Co., that Mr. Maddison had knowledge, which knowledge they assured me of, that Mr. Hickson's son was connected with the firm after their leaving it. I asked them to assure themselves of all these facts, because without a doubt they would have to go before some tribunal, where they would have to give evidence on oath, and even then I declined to take up the matter from them unless they brought a greater body of contractors who could vouch for the facts which they had placed before me. They then brought in other contractors. These other contractors, each of whom made statements to me, told me about the schedule of Contract 79, the schedule of Contract 69, and of Contract 72. They told me about conversations which Mr. Carter, Mr. Gummow, and Mr. Snodgrass, had had with them, very likely boasting statements, but some of which certainly have been established with the light of truth by subsequent evidence which has been given before this Commission. They also told me of the letting of Contract 77 on the Monier system. They put it to me in such a way that it certainly

certainly appeared to me to be a very improper way of contracting. When I heard of this intimation of a contract, a plan of which and the estimate of which had been given by the builders, and that they had obtained a schedule, I recollected my conversation with Mr. Webster, and that it was of a somewhat similar nature; that in a former case in Adelaide the trouble had been that the contractor had there introduced his own plan and his own specifications and his own tender. After I heard of these particulars from these contractors, there were workmen who brought me tales, some of which they will not substantiate on oath. It is useless for me to state their names, as they did not appear before this Commission. Two or three others who did give me information have given evidence before this Commission, particularly Dawson. I was very careful to make sure that there was something in this before I moved; and, in the first speech I made in Parliament concerning Carter and Gummow's relations with the Public Works Department, I only asked for a Committee to inquire into this matter; but, although my motion asking for a Committee or Commission ran through the business paper, on no occasion could I get the Minister for Works to give me even half-an-hour's opportunity of passing it. While I was waiting for that opportunity I moved for certain papers to be placed on the Table of the House. These papers clearly bore out at least the gist of that information which had been given to me. I could see that the papers were not complete, and that there must be a considerable amount of information which ought to be obtained by a Commission before the matter was allowed to rest. I also looked up the Parliamentary records to sift these rumours of the Adelaide misfortunes of Mr. Hickson. I found out that the Parliamentary papers of South Australia contained virtually the fullest information on this subject, which bore out what had been told me pretty clearly. So I thought, in the interests of the public, with the knowledge which was before me, that I was compelled to place it before a Commission. With regard to the various contractors who waited upon me in the matter, I can give the clearest information if necessary. In the first place, Mr. Williams and Mr. Maddison waited upon me. I said I would not take Mr. Maddison's statement unless it was backed up by Mr. Ewing, who he said was present. Then, on the second occasion, Mr. Ewing came with the rest of the contractors of whom I had spoken—I suppose ten or twelve of them. The gentlemen who were present were Mr. Gilliver, the Butchers, Mr. Williams, Mr. Ewing, one of the O'Neills and his partner, Mr. Rogers, who was a partner in the firm of Carter, Gummow, & Co., Mr. Benjamin Rhodes and his partner, and several others. After I got their information upon these particulars—all the particulars I have placed before this Commission were practically placed before me at that time—I asked the Minister for Works privately to have an inquiry into the matter which would have avoided altogether publicity; but he would not consent, and he accused me of having a personal grudge against Mr. Hickson. I would like to say, your Honor, that, instead of having a personal grudge against Mr. Hickson, I do not think I ever saw him before I became Chairman of the Public Works Committee, but perhaps once when I went to see him in connection with a bridge over George's River at Liverpool; so that I had no ill-feeling towards him. But when the Public Works Committee was being elected in 1894 I made an effort to get on that body, with the object of trying to use that position to see whether the Government did make up their estimates on a schedule form, and on an unreliable form, as I thought it was. It was there I came into contact with Mr. Hickson. I felt convinced that the work which was placed before that Committee, the prices put upon the work, and the method of estimating, showed that very grave extravagance was being carried out. But more than that, it was in my mind, from the evidence which was adduced, that Mr. Hickson had put an extravagant cost on the bridge with the object of pressing a scheme for the resumption of the head of Darling Harbour on the Committee. With all the knowledge I had of the different matters, with the knowledge I told you I have had, that was the only impression which was left on my mind; but it was not one of personal hostility. I do not think I have at any time shown towards Mr. Hickson personal hostility, and certainly not from any grounds which he could have given me, because towards me he has been always most courteous in all explanations. On matters where I have written to his Department, I have always received a courteous answer and business-like treatment. The information I have put before you is the reason of my moving for this inquiry. And as to the motives—if I am to be examined as to the motives—the motives were nothing but those which would come to any man in public life, who felt himself compelled to act upon information which was placed before him.

14890½. *Mr. Smith.*] Who is this Mr. Webster? He was, I believe, a resident of Adelaide.

14891. He was in your employment? Yes.

14892. How long? I suppose he was in my employment for about three years, perhaps.

14893. When? That would be from 1890 to 1892.

14894. Do you know where he is now? I really do not know.

14895. When did you see him last? He supervised the building of a bank at Brewarrina for me, and that is the last I had to do with him. I expect after he came away from that work he left me. That is the last I saw of him.

14896. What was he? An architect.

14897. You do not know whether he is in the Colony? I really do not know.

14898. Have you made any inquiries for him? No.

14899. You did not think, as you were going to mention his name here, that it would be advisable to know where he was? No; I had no need to bring him here, because the information which I had from him was to be obtained more fully from our own Parliamentary records.

14900. From our own Parliamentary records? No; I mean from the records of the South Australian Parliament, which we have in our Parliamentary Library.

14901. Did you make a note of these records you are referring to? I could tell you of them.

14902. Will you kindly tell us? The Votes and Proceedings for the years 1879 and 1880, and the speeches upon the Public Works trouble of the year 1879.

14903. This information which you got from them rests entirely on speeches? No; it rests upon a Commission before which Mr. Hickson himself gave evidence. It rests upon his evidence.

14904. Was there anything else besides what you have mentioned there? I can give you details if you wish it of what is contained in them.

14905. I do not want to hear what was in them. Was there any other book that you referred to containing information on this matter? No; those are the books.

14906. It was in 1890 that Webster came to you? It was perhaps in 1889.

14907. Was he in this Colony before then? I really could not tell you.

14908. Did he bring any reference when you took him in? I do not think he did. I was joint architect for the

V. Parkes. construction of the Australian Mutual Provident Society's Office at Adelaide, and I think he came to me through some architect there recommending him.

28 Aug., 1896. 14909. What was he there? I really could not tell you.

14910. You do not know? No.

14911. You do not know what his antecedents were? No; he came to me, and he seemed to be a man who knew his profession, and I placed him on the job.

14912. So that you do not know anything about his antecedents before 1889? No.

14913. And since 1892 he has vanished from your sight altogether? I expect he could be found.

14914. *His Honor.*] I do not understand that he gave you any more information than you say is contained in the Votes and Proceedings of the House of Assembly of South Australia? Not so much.

[*His Honor to Mr. Smith: The presence of Mr. Webster is immaterial. He would not be of any use if he were here.*]

14915. *Mr. Smith.*] I think you said you were the Chairman of the Public Works Committee when Mr. Hickson was examined? Yes.

14916. I think you said that Mr. Hickson was trying to force on the Committee a scheme, showing that the alternative scheme was so expensive? Yes, I did.

14917. *His Honor.*] It was a substitution, by a closing up of the head of Darbour Harbour, for a Pymont Bridge? The question at issue was a new Pymont Bridge or a closing up of the head of Darling Harbour.

14918. *Mr. Smith.*] I think you went to considerable trouble in getting outside evidence of experts? Yes.

14919. You went to a great deal of expense too? £110. That does not seem a very great deal.

14920. In fact, there was a little trouble on the Committee about your having done that without having consulted the members of the Committee? Yes; but I did not do it without consulting them. They only complained of its costing that.

14921. Referring to the minutes of your proceedings on the 7th November, 1894, I think a resolution was passed that the Committee proceed to consider the evidence with a view to reporting on the subject to the Legislative Assembly? Yes.

14922. I think a timber bridge was to be recommended? Yes.

14923. Then, I think, you will find that, by consent, on 13th November, the chairman—that is, yourself—addressed the Committee? Yes.

14924. After your statement a resolution was passed to reopen the inquiry in consequence of the statements you made? Yes.

14925. Then I think you will find that on the next day Mr. Hickson was further examined? I believe he was.

14926. You remember that you cross-examined him on 14th November as to some supposed contradictions in his evidence? Yes.

14927. He was cross-examined at great length by you? I believe so.

14928. And Mr. Darley was examined too? Yes.

14929. Then finally the report is drawn up, and after the examination on the 15th November you resigned? Yes.

14930. Somewhere about that date? Yes.

14931. A report is drawn up on 21st November in which this passage occurs:—

The resolution which contains the present Committee's decision in their inquiry was passed on Wednesday, 7th November, but at the next meeting of the Committee, in consequence of certain statements made by the Chairman in condemnation of the proposed timber bridge approved of by the Committee, it was decided to reopen the inquiry for the purpose of further examining the Commissioner and Engineer-in-Chief for Roads and Bridges, and examining the Engineer-in-Chief for Harbours and Rivers. These officers were accordingly called before the Committee, and closely questioned on the points which had been raised by the Chairman. The evidence dispelled all doubt as to the stability of the bridge as designed, and confirmed the Committee in their decision to recommend its construction. The Commissioner and Engineer-in-Chief for Roads and Bridges pledged his professional reputation that the bridge will be thoroughly suitable,—perfectly safe, containing no structural defects, and serving the probable traffic between Sydney and Pymont. He would prefer, he said, an iron bridge; but he recognised that it may not be desirable at the present time to erect such a bridge, seeing that his estimate of its cost is £220,000.

? Yes.

14932. That is substantially a correct account of what took place according to the minutes we have gone through? Well, it is what took place at the Committee.

14933. The Committee, whatever view you may have taken of Mr. Hickson's evidence, based their report on the evidence of those two officers? Yes.

14934. They did not agree with you at all events in your view of his evidence? Of course that was only the report of the majority. You must remember that four members of the Committee took the same view as I did.

14935. Then I think you stated afterwards that your reason for leaving the Committee was that you considered that the Committee was going more for the salvation of the officers of the Department than for the salvation of the public interest—was not that the expression you used? I believe I did say that. I said that the Committee instead of trying to economise in the cost of the works took the evidence of the Departmental officers to sustain them in everything, eliminating altogether that of independent witnesses, and that, therefore, they were more looking to the salvation of public officers than to the interests of the country.

14936. Did you say this:—

I always thought the Committee was sworn to the salvation of the public funds, but I find the majority of the members are only bent upon the salvation of the interests of the official heads of departments.

? I believe I did.

14937. I think it was a majority of 9 to 4? I think so.

14938. Although there was that fullest inquiry, and that judicial finding on the inquiry, I think you afterwards told the House and the country that Mr. Hickson's evidence on that occasion almost amounted to perjury? I said—

14938½. Did you or did you not say that? It would be better if you would read my Parliamentary speech and ask me on what appears there.

14939. Will you answer my question whether you did say that? I will tell you exactly what I said by looking at the speech.

14940.

14940. I ask you whether you remember having said that? What I recollect having said is that Mr. Hickson's contradictory evidence amounted almost to perjury—if I recollect aright.

14941. I will read you what you did say :—

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The evidence was so inconsistent and so varying, that having been given on oath, it almost amounted to perjury.

? That is practically the same.

14942. You think in face of what took place there you were justified in making that statement to the House? I did, indeed. I thought I was absolutely justified.

14943. Do you think that is a fair discharge of your duties as a representative of the people? —

*His Honor (to Mr. Smith).] We are going a good deal outside the question now. Mr. Parkes is not in any sense on his trial before this Commission. If Mr. Parkes had narrated facts which were material to this inquiry, some latitude might be allowed in cross-examining him as to his credibility. That question does not arise at all now. As to Mr. Parkes' action as a Member of the House, it is going too far for us to go into that matter.*

*Mr. Smith.] I submit, your Honor, that this statement of facts has been made in such a reckless way that I am entitled to show what this witness considers to be a fair way.*

*His Honor.] I say that that is going outside the question altogether. Mr. Parkes did touch upon his motives, but it was only to a very slight extent. As I have all along said, they are utterly immaterial. I do not wish to go into questions which are not essential when there is so much to consider which is essential.*

*Mr. Smith.] I will be as short as I can, your Honor. That seemed to me to be a distinct charge of almost perjury.*

*His Honor.] It may be well-founded or it may be ill-founded; but the motive which induced the charge being made is immaterial.*

14944. *Mr. Smith.]* When was young Mr. Hickson's name first mentioned to you, and by whom? It was mentioned to me the first time by Williams and Maddison.

14945. When? Somewhere about the 20th September.

14946. That, I suppose, would be shortly before you asked that question in the House on 19th September? What question was it?

14947. On 19th September, 1895, Mr. McCourt, for Mr. Parkes, asked a series of questions referring to certain contracts; but the principal questions are the following :—

(7.) What connection has a Mr. Hickson with this firm or with the works? (8.) Is this Mr. Hickson a son of the present Engineer-in-Chief?

Mr. Young's answer to these questions was as follows :—

(7.) He is engineer to the contractors. (8.) He is the son of the Engineer-in-Chief for Public Works; but the Balmain contract referred to is being carried out under the supervision of the President of the Water and Sewerage Board and Engineer-in-Chief for Sewerage Construction, Mr. Darley. In the case of the other contract referred to, namely, the sewerage works at North Sydney, which was carried out under the supervision of the Engineer-in-Chief for Public Works, I am informed that Mr. Hickson, junior, had no connection with the work, being at that time in South Australia.

These two questions were asked by you? Yes.

14947½. You did not take that answer from the Minister as true, did you? That was on 19th September. I must have asked these questions within a very short space of the time I received the information, but if I asked these questions at this date I must have received the information from Williams and Maddison in August before that, because before I asked those questions I saw the other contractors. The reason why I did not take this answer—

14948. I did not ask you for a reason; I asked you, as a matter of fact, if you did or did not take that answer as correct? I did not take it as correct.

14949. In fact, in your first speech, on the 26th September, on this matter, you said: "I asked the Secretary for Public Works last week what connection Mr. Hickson had with the firm and with this work. I was told that Mr. Hickson was the engineer to these contractors"? Yes.

14950. Did you go on to say: "But I am informed upon the most reliable authority, that of a Mr. Maddison, the contractor who has left this firm, that Mr. Hickson took the position as a partner in the firm, he being a son of the Engineer-in-Chief"? Yes.

14951. Did you have any statement in writing from this Mr. Maddison? No. I did not accept this. I said to him, as I said to all those who came to me and urged me to get this Commission, "If you urge for this Commission you must be prepared on oath to state what you state here," and they said, "We are."

14952. Who said that? Maddison and Ewing. I felt convinced and I thought to myself that if a Commission or Parliamentary Committee was granted certainly the truth would come out.

14953. Then you go on to say :—

Now, it is an unfortunate position that this firm should have been allowed contracts under such circumstances as these; their engineer having to communicate with his father, who is in a position in the Public Works Department, in which he could grant all sorts of concessions. This firm are the only contractors who, during the last twelve months, have received these numerous concessions. I have it upon the authority of Mr. Maddison, who has undertaken to produce a copy of the telegram, that a wire was sent in March, 1894, by one of this firm of contractors, Mr. Carter, to another member of the firm, Mr. Gummow, who was then in South Australia, to this effect: "Mr. Hickson must be taken into the firm at any cost."

Do you remember saying that? Yes.

14954. Did Mr. Maddison then tell you that a telegram had been sent to the effect mentioned here? He did, undoubtedly.

14955. You know that he denied it here on oath? I have heard it denied; but I have heard a good many things denied on oath here.

14956. At all events, you find now that he is not the reliable authority you thought he was—is not that so? Of course, I heard his denial of some matters on oath, but Mr. Maddison since he gave me that information fears that he is in the position of one of these contractors.

14957. How do you mean? He becomes one of the firm of contractors by his former association, and that is the trouble.

14958. So he has come here and perjured himself—is that what you mean? What I say is this—

14959. Is that what you mean? What I say is this—by denying what he said before—

14960.



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14960. Answer my question—yes or no?

[His Honor to Mr. Smith: Mr. Parkes is explaining that something was said to him before, and that something else has been said on oath; and the conclusion draws itself. It is one of those questions which I generally stop Counsel from asking.]

He might have given me a wrong statement there and given me a correct statement here.

14961. Mr. Smith.] You find out now, Mr. Parkes, that he is not a reliable authority? That seems to be so on some points.

14962. There is no doubt, is there, that this reliable authority is absolutely unreliable;—answer no or yes? I must say that his statements look to be unreliable on some points.

14963. This was the authority you were setting up against the official information you had received? Yes; but you must change the position of time.

14964. Then we come to the next paragraph:—

It was about this time that Mr. Hickson left the Department, as his father said, on the score of retrenchment, and took up his position as an alleged partner in this firm; or, as I have been informed by the Minister, their chief engineer.

Who told you that? Of course I gained that information from these contractors too.

14965. You told the House that Maddison had not got his telegram—that a copy could be got from the Telegraph Department? Yes.

14966. Had you made any inquiries there? I have, and I find that they destroy their records after twelve months.

14967. When did you make these inquiries? I made these inquiries after this Commission sat, with the object of producing the telegram as evidence here.

14968. Not till then? No; it is a remark which any man might make.

14969. You made inquiries, and you found the records were destroyed? They destroy them after twelve months, they tell me.

14970. Did you ever ask Mr. Maddison to fulfil his undertaking, and get that copy for you? When the Commission was granted —

14971. Did you or did you not—answer straight? When the Commission was granted —

14972. I do not want to know about the Commission. I ask you did you or did you not ever ask Mr. Maddison to fulfil his undertaking;—say no or yes, and explain afterwards? When the Commission was granted I asked him to fulfil his undertaking—to go before the Commission and give his evidence and produce his facts.

14973. It was not until the Commission had been appointed that you asked him that? That is so.

14974. You go on to refer to Contract 77—but I do not want to go into that matter now—and then you refer to the letting of Contract 79A without a tender. You refer to Mr. Hickson's minute of the 22nd March, 1894, and to his subsequent minute of 29th March, 1894; and after reading the minutes you say:—

This was on the 30th March, 1894. How sudden a change? It is not the Minister who has to do with this. The Minister is generally led by the Head of the Department, it does not matter whether it is the present or the last Minister. The Heads of these Departments ought to be above reproach. There ought to be the greatest possible check put upon them. When we see a rapid change like this in a minute in a few days, after a son of the gentleman concerned has taken office under the contractors, then there is some suspicion.

You said that, did you not? It is in the speech, I believe, if you read it correctly.

14975. You told the House then that this second minute of Mr. Hickson's, which you say is a change on his former one, was written in consequence of or in connection with the fact that his son had been taken in as a partner? Are the minutes in *Hansard*?

14976. The minutes are printed in *Hansard*, at page 1201? I forget what they were. It is quite possible for a man who knows anything about affairs and who gathers partial information to make an error. It is very possible that they appeared in that form to me, because they are contradictory.

14977. You think they are contradictory? Yes.

14978. At all events, Mr. Parkes, you told the House that it was a matter of suspicion that this change of front on Mr. Hickson's part took place at the very time his son was taken in as a partner? Yes.

14979. It now turns out that your premises were absolutely false;—isn't that so. Had you the definite information at that time that Mr. Hickson, junior, was taken in as a partner? Of course, in making my speech—

14980. Did you have any definite information, or did you not? Sufficiently far to guide me in my speech.

14981. In dealing with the other answer which the Minister gave, you said that Mr. Hickson, junior, had no connection with the contract at North Shore, being at that time in South Australia, and you go on to say—

But Mr. Hickson has been going backwards and forwards between here and South Australia.

Who told you that? Undoubtedly I was mistaken there. I was told by those who waited on me.

14982. Do you remember who told you? The contractors generally. I could not tell you the individual contractors who did. It might have been Mr. Maddison or it might have been Mr. Ewing.

14983. There has not been one word of evidence adduced here that anybody told you that? After all the point is not very material.

14984. From your point of view it is not very material whether he came backwards and forwards? At the time I made my speech it was in my mind that he examined all the work. In the light of his evidence I see he did not.

14985. At that time you were under the impression that he was looking after all their works? Yes.

14986. You remember the House adjourned in December? Yes.

14987. And shortly before the adjournment certain papers were laid on the Table of the House? Yes.

14988. The Minister ordered the laying of the papers on the Table on 19th December, 1895? Yes.

14989. Does Mr. Hickson say, at the bottom of page 2 of the Parliamentary paper—

My son is not now, nor ever was, a partner in the firm, and as he happened to be in Adelaide, and, as far as I know, knew nothing about the firm's transactions in Sydney, he did not communicate with me, either directly or indirectly, in connection with the firm's business.

Yes, he does; but what about that?

14990. You see there that you have Mr. Hickson's denial? He says his son is in Adelaide "now," but his son was up here from at least August.

14991.

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14991. We will have the whole of the answer—

I know nothing about the telegram alleged to have been sent in connection with the appointment of my son, having heard of it for the first time in Mr. Parkes' statement, and cannot understand how it could have been sent, seeing that my son left the Department in April, 1893, and that the telegram of March, 1894, is said to have been sent when he had already been in the employ of the firm for nearly twelve months.

When you saw that, did it occur to you then to make inquiries about that telegram? No, it did not.

14992. Did you make any inquiry at all about it? No, because I intended to force this to a Commission, and I intended when I got that Commission that I should obtain all the evidence properly. You must remember that when you go privately to obtain information from a public department, you have very little chance of getting it if it causes trouble; but if the Commissioner ordered the production of this document it would be produced. I applied to the Postmaster-General for information as to how I was to get this telegram, and then I intended to ask His Honor to give an order for its production here; but the Minister informed me that every telegram in the Department was destroyed on the expiry of twelve months. What was the good of my going any further then. As to getting information of a detailed character like that I never attempted to do so. I wanted to force this matter to a Commission. If I was wrong I was wrong; but the information I received was sufficiently strong. I am quite willing to admit wherever I am wrong; but, in any case, you see at once that it is only a statement of what is said to me. It is asking for an inquiry to see whether the contents of that speech are correct.

14993. Although you had the undertaking of Maddison to produce a copy of the telegram, it did not occur to you to fulfil that undertaking? It did.

14994. It did not occur to you before May? No.

14995. Although you had distinctly a denial of the truth of his statement? You know when I got—

14996. Is it not so? Yes; but that report, although it was laid on the Table of the House on 19th December, I did not get until about six days before I made my speech.

14997. Your second speech? No.

14998. You did not have it in your hand? No; in fact, it was a Member of the House who showed me the report, otherwise I should not have known about it.

14999. When you did see it you made no attempt to see who was right? No; I left everything to be cleared up by the Commission. You will see that I commented on it in my second speech.

15000. At the time you made your second speech, you had made no further inquiries at all? Not on this point.

15001. Did you see Mr. Maddison? Yes; I had many conversations with him on the matter.

15002. After you had seen the paper, and before you had made your second speech on 12th May, had you seen him? I could not tell you.

15003. You cannot remember whether you confronted him with what Mr. Hickson had said? No. All I know is the moment the Commission was granted—

15004. I am not taking about the Commission at all? It is the only way in which I can explain it to you.

15005. All I want to know is whether, between the reading of that answer by Mr. Hickson and the making of your second speech, you made any inquiries at all? There were only six days in the meanwhile, and I did not. The reason why I did not do so was because I spent all my time in hurrying through to get this Commission granted. I used every effort to do it. After the Commission was granted I sent for all the witnesses who had given me information, and said, "Well, now you must prepare your material." I informed Maddison, amongst others, that he must get the particulars he had given to me.

15006. Without making inquiries you told the House in your second speech that Mr. Hickson's statement was untruthful from beginning to end? Where did I say so?

15007. It is reported in *Hansard* at page 24? Did I say in this particular detail?

15008. You said, "Let me take up this report of the Engineer-in-Chief; it is untruthful from beginning to end"; and you go on to deal with it in the very first sentence. Without making any inquiries you made that statement to the House? Where did I comment on Mr. Hickson's son in that speech?

15009. In fact, you complained very much to the House about this statement being put before the House about the time it was put before the House, and the manner in which it was put before the House. You thought it was intimidating Members of Parliament to do it? No. I say—

15010. Did you not say there would be intimidation if this sort of thing was allowed? Read the words I used, and I will answer as to them.

15011. You said in your speech:—

I want to point out to hon. members that under the course pursued the Engineer-in-Chief is allowed to come into this House as if he were a member of it, and abuse an hon. member who attempts to challenge his conduct as a servant of the State. If that is to be allowed the privileges of every hon. member are gone. The Engineer-in-Chief says:—Although it may be thought, as, indeed, it has been said, that I am making too much of this matter, and that no one really takes any serious notice of these statements, I need hardly point out what a serious matter it would be if they were believed.

? I did.

15012. Again on page 37 you say—

Nothing can so drag the privileges of Parliament through the mud as to allow of any intimidation against hon. members stating here their free thoughts on all subjects.

? "Without reflections being made on them," I should have added.

15013. You complained then of these papers being laid on the Table in this way? Of their being laid on the Table on the last day of the session and as a Report on Public Works.

15014. How can you say it was an attack on you? Because of the first paragraph. While I was asking for a commission, which could have been granted on the following day, in the month of October, the Government blocked in every way the motion; and at the end of the session, when the motion could not come on, the last thing which was done was to put this report on the Table of the House; then would come a recess of, it might be, six months for all we knew, and it would have to remain there as a record of the House, and with that comment of Mr. Hickson contained in it.

15015. It did not occur to you then, after having made certain definite charges on certain facts against Mr. Hickson, that it was only a fair thing to give Mr. Hickson the earliest opportunity of replying to those charges? He ought to have had it. It was not my fault that he had not.

15016. In this speech, at page 24, you said:—

I can prove by statutory declaration that he came over twelve months before with Mr. Gillan, one of the contractors.

? Yes.

15017.

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15017. Where is that statutory declaration? I had not one.
15018. You indicated it? No.
15019. Who made it? One was not made. It was one undertaken to be made.
15020. You said, "I can prove by statutory declaration." You meant that some other reliable authority had said that he would make one for you;—who was that? That was, I think, Dawson. I am not sure whether it was Dawson or whether it was Ewing; it was one of them.
15021. You never got that statutory declaration? No. It is of little or no value. It was not worth while.
15022. You did not consider it a very important statement? Nor does it matter very much at what time he came up.
15023. We know, as a fact, that he did not come up at all except on a holiday? The evidence establishes that fact.
15024. Then you said again here, distinctly, Mr. Hickson's son came up from Adelaide with Mr. Gillan to sign that bond? Yes.
15025. Who told you that? Maddison and Ewing told me that. If you were to read on further and ask me whether I made a statement as a continuation of that you will see the reason why.
15026. After that speech you say you made no inquiries at all until the Commission was granted? I think the Commission was appointed within three or four days of that speech—certainly within a week.
15027. I think the Commission held its first sitting on 27th May; did you make any inquiries before that date? No.
15028. You made no inquiries before 27th May as to the evidence to be adduced? No; except as to preparing the evidence.
15029. Did you make any inquiries with regard to young Mr. Hickson;—did you see either of these witnesses, and find out whether they could substantiate their statement? I told you that I waited until after the Commission was appointed.
15030. On the first day, did you make any inquiries? I sent for all the witnesses to ask them if they were prepared to make their statements.
15031. Did you press them on the truth or otherwise of this charge about Mr. Hickson? No.
15032. You made no specific inquiry about that? No; I was convinced in my own mind that they were correct. I was convinced that everything would come out exactly as they said.
15033. In spite of this distinct denial given officially twice? Yes; but there are many things in this denial which would lead one to doubt it.
15034. It would depend upon who the one is, perhaps? Yes.
15035. At all events you made no specific inquiry, although the truth of Maddison's statement had been absolutely contradicted before 27th May? I made no inquiries for this reason—that there are two statements, and the Commission would elucidate the truth.
15036. On the first day the Commission sat, I think you formulated some charges, which you called—  
Charges made in the Legislative Assembly of New South Wales as to improper conduct in connection with contracts of Carter, Gummow, & Co., and referred by the said Legislative Assembly to a Royal Commission for inquiry and report.  
? Yes.
15037. One of those charges was—  
That Robert Hickson, while being an officer of the Crown, viz., Engineer-in-Chief for Public Works, did act collusively with his son, George Hickson, a partner of the firm of Messrs. Carter, Gummow, & Co., by which the said George Hickson obtained wrongly money belonging to the Crown.  
Yes; but I withdrew that charge.
15038. On the 15th June you withdrew that charge? Yes.
15039. And on that date you formulated this charge:—  
That Robert Hickson, while an officer of the Crown, viz., Engineer-in-Chief for Public Works, did allow of undue concessions being granted to Messrs. Carter, Gummow, & Co., contractors for sewerage works in the Colony of New South Wales—his son, George Hickson, being an interested party in the firm of Messrs. Carter, Gummow, & Co.  
? Yes.
15040. What took place between the 27th May and the 15th June which induced you to alter the form of your charge? In the first place I thought the charge was worded in too harsh a manner, and in the second place, on the day before Maddison and Ewing came here, from their conduct they seemed to me so very anxious to get out of the affair altogether, because they were going to be brought in on defective work with the other contractors, that I was doubtful whether they would give me such full particulars as formerly.
15041. I suppose that was the first time when you began to find out that your authority was not reliable; is that so? I really thought at the time that they would become adverse witnesses from the fear of being associated with the defective work.
15042. So you thought it wiser to alter the form of your charge? Mr. Hickson objected to his son's coming up first of all. I never intended to put in this charge at all. I put it in in the first place with the object of getting full and truthful information before the Commission from young Mr. Hickson. He would not have come back without a pretty strong charge being made.
15043. It was a pretty strong charge of dynamite? That charge was put in really with the object of inducing Mr. Hickson to fetch his son back here to give information. It was on information, which I considered to be so conclusively true, at the time, that it would be sustained. You must remember that I did not put this charge in until after I saw that Mr. Hickson, junior, would not come to the Colony. I thought it was absolutely essential to have him here, and therefore I put the charge in. If he had been coming I would not have made any charge at all; I would have taken the matter in Maddison's and Ewing's evidence and not made a charge. I asked His Honor too.
15044. At all events the main reason was that when you saw Maddison here, just before you called him on 15th June, you began to see that he was wavering;—is that the reason why you altered the charge? That is another reason I intended to alter the charge all along.
15045. What did you put it in for at the start? I made the charge in the strongest language with the object of inducing Mr. Hickson to fetch his son back.
15046. You think that is a proper thing to do—to bring a serious charge like that of corruption against a public officer and leave it standing on the records of this Commission for upwards of three weeks with that object? I was under the impression that I had absolute evidence to sustain it. It was a matter of kindly feeling to Mr. Hickson which made me not put it in in the first place.
- 15047.

15047. What do you mean? It was a consideration for Mr. Hickson's feelings; I thought his son would not be here. V. Parkes.
15048. You say then that this charge was substituted on the 15th June, after you had had an interview with Maddison, previous to his examination here? Yes. 28 Aug., 1896.
15049. Then what took place at that interview induced you to alter the charge? Yes. They came to me and protested that bad work was being entered into; that their names had been inserted in the Commission; and that they were making a "whip for their own backs."
15050. Did you ask them whether it was true what they had stated before with regard to young Mr. Hickson? Yes.
15051. Why did you alter the charge if they still stuck to their statement? I never intended to put in that charge till I had the information. I put it in strong in order to induce his father to fetch him here.
15052. Did you take legal advice; did you consult Mr. White or any other solicitor with regard to that charge? Yes.
15053. Were you advised that it might amount to libel? No; he advised me that I could make my charges as definite as I wished; that, in order that the Commission might obtain the truth, this charge might be made as full as possible.
15054. Nothing further than that? No.
15055. Mr. Hickson, junior, was examined here on the 17th June, and this substituted charge was put in on the 15th June, two days before. It was known at that time that he would be here. Was not that the reason that you thought it advisable to pull in your horns? No; that was not the reason. I was never more surprised than I was at the evidence that was given. I was fully convinced that the facts I had stated were true.
15056. You heard young Mr. Hickson's evidence? Yes.
15057. He swore here what was the extent of his interest in the firm, viz., a salary of £5 per week? Yes.
15058. You once thought he got a travelling allowance? Yes.
15059. You heard the evidence of Mr. Carter confirming that? Yes.
15060. You heard Mr. Gummow, too, I believe? Yes.
15061. You still think there is a shadow of a doubt that Mr. Hickson, junr., had any interest in the firm beyond that? It is not for me to judge of the evidence, but I have a doubt.
15062. In the face of the books you say that there is a shadow of a doubt? I do. If Mr. Carter and Mr. Gummow had not given their evidence I would not. They made a statement in their evidence which does leave me in doubt now.
15063. When this substituted charge was put in you were required to put in particulars of the "undue concessions"? Yes.
15064. You included Nos. 1, 2, 3, 4, and 7, of the charges on Contract 69? I did.
15065. And certain others and Nos. 1, 2, and 4, of Contract 79A? Yes.
15066. In this charge you say:—
- That Robert Hickson, while an officer of the Crown, viz., Engineer-in-Chief for Public Works, did allow of undue concessions being granted to Messrs. Carter, Gummow, & Co., contractor for sewerage work in the Colony of New South Wales—his son George Hickson being an interested party in the firm of Messrs. Carter, Gummow, & Co.
- Do you mean to charge from that that, because George Hickson was an interested party, these "undue concessions" were made? What I mean is that Mr. Hickson's son, having an interest with the firm as long as they had Government contracts, was kept there. It seems that during the period he was there. This is not for me to judge; it is for the Commission to judge.
15067. All I want to know is the meaning of this charge;—do you mean to say that, because Mr. Hickson, junior, was an interested party, therefore "undue concessions" were made? I conceived it to be so.
15068. You had not quite said whether that is what you do mean? From information I had I conceived it to be so.
15069. That is the way you want to put in before the Commission? As far as I could see that was so.
15070. You say that one of these "undue concessions" on Contract 79A was "with allowing defective work to be done by which a loss is sustained by the Crown";—you say that was done because young Mr. Hickson had an interest in this firm;—is that your charge? Yes; in a way.
15071. Is it or is it not? In a way.
15072. It is, in a general way, a charge? I would be acting the part of the Commissioner if I were to proceed with a reply.
15073. *His Honor.*] The question is not on what has transpired since, but on what was in your mind when you defined the charges in that way? It was in my mind that that was so.
15074. *Mr. Smith.*] That this defective work was allowed to be done because young Mr. Hickson was associated with this firm? Yes; because contractors known to do defective work once should not, I hold, be allowed to have a second contract from the Department.
15075. What was the defective work you had in your mind with regard to Contract 79A? In that case I thought I should be producing, and I have produced, evidence that there was a deficient quantity of material put in the contract.
15076. Was there any evidence besides the evidence of Dawson which you had in your mind? Yes; there is the evidence of Reid, the Inspector.
15077. Of Reid, the Inspector, and Dawson, and who else? I think those are the two.
15078. What had Reid to do with Contract 79A;—did he lead you to believe that he had anything to do with it? I thought you said Contract 79. I think Reid was an Inspector for Contract 79A.
15079. Did you get any statement in writing from Reid? No; but I got a statement from him.
15080. It was a verbal statement; was there anything else;—in fact, Dawson is the only one who has given evidence about Contract 79A? No; there was nobody else.
15081. Do you mean to tell the Commission that you charge Mr. Hickson with allowing that defective work which Dawson told you of because of young Mr. Hickson's interest in the firm? I was wrong in saying that there was not another witness. You must remember that Hansen, who was to give evidence, did give evidence before the Commission. He was dismissed from the job, and I had him in mind.
15082. You had Hansen in mind;—what did he tell you, then? Before the Commission?
15083. At the time you framed this charge? Hansen did not tell me anything.
15084. What had you in your mind? I had been told that Hansen had done this defective work.

V. Parkes. 15085. Was there anybody else besides Dawson whom you had seen, and Hansen whom you had in your mind? Yes; Reid had told me that he believed there was defective work on that job, and that if he had been retained as the inspector he could have prevented it.

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15086. Was there anyone else who told you about this defective work? No.

15087. Why did you arrive at the conclusion that this defective work had been allowed because young Mr. Hickson was associated with the firm? I must admit that, in asking me to fix these charges, you set a fair trap for me.

15088. Not a bit? In the first place, I hurriedly enumerated those without looking at that; but I hold all the same that the head of a department, when he knows that a contractor has once done defective work, should take very good care that he does not do it again, and should see that an inspector who is preventing it is not removed from the work.

15089. Do you say, with regard to this, that I set a trap for you? It looks very much like it.

15090. You think, then, that when I applied for these particulars of this vague and general charge, and His Honor ruled that it was a reasonable request, I was setting a trap for you? I did not at the time see your object, but I see it now.

15091. You do not think it was a reasonable thing, when a vague and vast accusation of this kind is made, that the man who lays the indictment, as it were, should be pinned down to particulars? Is it a vague and vast accusation?

15092. *His Honor.*] Now, Mr. Parkes, you have not answered that question so far as it requires an answer? I do not think it is a reasonable thing—not before a Commission on public matters.

15093. *Mr. Smith.*] You think that a man ought to be allowed to make this general accusation and not specify what he means? I think he ought to have the fullest scope for his charges.

15094. In asking you for these particulars you think you were limited in that scope you are entitled to? I think you meant to limit it in some manner for your own objects.

*His Honor (to Mr. Parkes): Remember you are not bound down by these specific charges, as I told you at first.*

*Mr. Parkes: Yes, your Honor.*

15095. *Mr. Smith.*] With regard to Contract 79A, did you not know at the time the charge was framed that this contract was not under Mr. Hickson at all? No, I did not.

15096. This defective work was not done until December, was it? But I did not know that Mr. Hickson had not control of this work.

15097. You did not know that? I do not know at the present moment that he had not.

15098. Although you heard the evidence here? I must not be the judge of the evidence.

*His Honor.*] Of course, Mr. Smith, the contract ran for a time after the change took place. It began before the change took place.

*Mr. Smith.*] But we have the evidence of Dawson, your Honor.

*His Honor.*] It is hardly fair to put the question in that way. When Dawson got in the box it was cleared up, with considerable difficulty too, what date he intended to refer to as the date on which he said he knew defective work was done.

15099. *Mr. Smith.*] I think I will leave Mr. Hickson, junior, alone now. I want to ask you, Mr. Parkes, one question which does not appear to be a charge formulated. In your first speech, on 26th September, at page 1198 of *Hansard*, you said:—

There is a set of contractors whose names or titles are Messrs. Carter, Gummow, & Co. They contract for various works in this country; at present most of them are about Sydney. This firm of contractors are identified with the Government in the most suspicious fashion.

I want you to tell the Commission what you meant by the word "Government"? The Government Department.

15100. Do you mean that this firm of contractors is identified with the Ministerial Head of that Department? No.

15101. You do not mean that? I do not know whom they are identified with. It is a general statement. How is it possible for a Member of Parliament to obtain the exact facts of a case. In a speech, he is bound to make general statements; and, on the information I had, it was a justifiable remark to make.

15102. Have you, Mr. Parkes, any more evidence to produce? There is some overlapping evidence which I have not been able to obtain, but which I asked His Honor if he would allow to be brought in.

15103. Have you any other evidence on which you base that charge of this firm of contractors being identified with the Government other than what you have called here? Yes; there is a good deal of evidence which might at any moment be available. During the time I conducted my case the Department, through yourself, brought in evidence which was not objected to; and I intend to ask His Honor to allow me, should I get any evidence which has not been available to me, and which I had before me when I made that speech, to allow me to submit it; and I do not think you can take exception to it.

15104. I certainly shall not object—that is, on this particular charge of this firm of contractors being identified with the Government in a suspicious manner;—how many of these deputations waited upon you? I suspect there were four or five.

15105. Were they all before the first speech was made? That I could not tell you; I cannot quite recollect.

15106. But Williams and Maddison were the prime movers in the thing? They were the first two who approached me. They said they had been requested by a number of smaller contractors, who had no opportunity of tendering, to come and see me. They put the statements before me. I asked, "Who are these other men?" and they enumerated certain firms. I told them to bring them to me.

15107. Do you know why they came to you? They told me the reasons, and the reasons are before the Commission.

15108. In fact, you were known to be a man who was very much against the present system of administering this Department? Yes.

15109. You have told us this morning that these two induced you to table the motion? Yes. They asked me in conjunction with other contractors to bring the matter before the House.

15110. I think besides that there was that notice of motion you gave in April, 1892? Yes.

15111. Which was referred to in the evidence of Mr. Davis the other day? Yes.

15112. Your idea in April, 1892, was to abolish all the professional officers? Yes, and to establish a national Board of Works. V. Parkes.

15113. These contractors came to you, I suppose, knowing that? I could not tell you.

15114. Williams and Maddison were the chief prime movers, and they brought the others? They were the first who waited upon me, others came afterwards.

15115. We have had half-a-dozen of them here;—we have had Butcher, Ewing, Gilliver, Rhodes, and Williams? Yes.

15116. You mentioned O'Neill;—he was one of them, wasn't he? I really could not tell you at this moment whether he was present at that deputation, but he was with me. They were rather straggling deputations.

15117. When did you last see O'Neill? I saw O'Neill after I had made my speech in Parliament the last time.

15118. Why did you not call him? Because he went back on everything he told me. I looked upon him as being an unreliable man.

15119. Then his tale was not true? How about Rogers;—has he gone back on you? I never called Rogers, because I am not quite sure whether his evidence was material. There is nothing in question on which he could give any evidence.

15120. I think Crosbie was mentioned by Gilliver;—do you know him at all? I do not know him. He might have been in the room.

15121. You referred to Mr. Carson in Gilliver's evidence;—you suggested his name to Mr. Gilliver? I do not think so.

15122. These are the questions I referred to:—

5274. You have named eight or nine of them? Yes. In addition to those I have named, there were Crosby and others—in fact, pretty well all the small contractors. There are three contractors who are not on a footing with us—M'Sweeney, Carter, Gummow, & Co., and Ahearne.

5275. What about Carson? He is engaged upon a railway. The balance present would be the small fry contractors.

That is a humorous remark. I wanted to know whether Carson was amongst the great contractors.

15123. *His Honor.*] He was the remaining sewerage contractor whom you remembered? Yes.

15124. *Mr. Smith.*] Carson was not one of those who attended the deputation? I never supposed he was. It completed the list. It was not worth while to report the question.

15125. There are no others, Mr. Parkes, whom you remember? No; I cannot remember now; but if you wish to have the names I can give you the names, because I entered them up.

15126. You have a list of the names of the small fry that Mr. Gilliver talked of? There is sure to be a list in the office.

15127. Each one of these contractors had his grievance, I think;—hadn't he his complaints when he came to you? Yes.

15128. They all came with complaints, one and the other? Yes.

15129. They were all men with a grievance? I do not know whether you can say a grievance. They all had some information.

15130. For instance, there is Mr. Maddison, who said the grievance of the contractors was that they had not a fair go at the tender-box? Yes.

15131. There were similar complaints? Yes.

15132. In fact, they were very jealous of Carter, Gummow, & Co., weren't they? I cannot tell you.

15133. But didn't they say that Carter, Gummow, & Co. were in the swim, and that they were not, and that they were determined to burst up Carter, Gummow, & Co.? No. They said to me, "You understand construction work, Mr. Parkes. You have taken some steps in connection with the Works Department, and you took some steps on the Public Works Committee. We can give you some information of something which has been done wrong in connection with the Sewerage Department, and if you like to listen to it you can correct it as it ought to be corrected." That is about the gist of what they said. I might add to that that they asked me to get this corrected without bringing Mr. Hickson or Carter, Gummow, & Co. into trouble.

15134. They did say that they wanted to burst up Carter, Gummow, & Co.? No, they did not.

Did you say in the House:—

What they say is, "If Carter, Gummow, & Co. are clever enough to get this contract, that is all right; but we want also to be in this sort of swim. They are in the swim at the present time, and we want to burst them up."

You said it? If that is the correct reading.

15135. Although the contractors never said one word of that to you, that is so? After they put before me a considerable amount of detail, I was justified in saying that.

15136. You were justified in saying that, although they never said they wanted to burst up Carter, Gummow, & Co.? They said they wanted to put a stop to Carter, Gummow, & Co.'s manœuvring of the contracts into their own hands.

15137. You told the House that these contractors had said, "We want to burst Carter, Gummow, & Co. up";—they never told you that? No.

15138. So that that statement is untrue? It is incorrect.

15139. *His Honor.*] Not in so many words? No. If you read that literally, it is incorrect; but the inference is that they wanted to put a stop to that firm's receiving contracts in the manner in which they were doing.

15140. You understood that the contractors wanted to spoil their little game? That is it.

15141. *Mr. Smith.*] You could see that they wanted, if they did not want to burst them up, to spoil their little game? Yes; and I want to spoil a lot of them.

15142. You could see that that was their object—that they wanted to spoil their game, and that they had all these grievances? I suppose that they wanted to have some justice done.

15143. That is what you understood, broadly, to be the position? I understood that they wished to have a proper state of affairs, seeing that they were getting the worst of it under the system. They wished to have a proper state of affairs, in order that they might come in. If a proper state of affairs ruled they thought they would have a better show.

V. Parkes. 15144. Seeing that, did it not then occur to you that, with men coming to you with a grievance like that, it would be just as well to sift their statements thoroughly before you ventured to speak on them? Yes; but you must remember, Mr. Smith, that a Member of Parliament, when he hears a number of things from a number of men whom he knows himself to be pretty astute and pretty cunning, and which coincide with other information he has, and after he gets a number of papers placed on the Table of the House which corroborate it to a certain extent, is justified in asking that there be an explanation and a clearing up of the matter. Otherwise no public man would ever do his duty.

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15145. One of the first matters you mentioned in your first speech is the letting of Contract 79A. There was this minute by Mr. Hickson of 22nd March, 1894, and his further minute of 29th March, 1894. You were in the House when Mr. Lyne made his speech, I suppose? What speech?

15146. On this motion of yours in which he refers to this particular contract? I was not in the House.

15147. I suppose you took the trouble to read his speech? I never did.

15148. You never read his speech? No.

15149. Before you formulated these charges, you never read his speech? No. The only thing I ever saw of his speech was a comment at the bottom that he did not know that Mr. Hickson's son was employed by the contractors.

15150. One of the charges in regard to Contract 79A is:—

Inducing the Minister on the plea of urgency to let the above contract to Carter, Gummow, & Co. without tendering, by which loss was sustained by the Crown.

The Minister referred to was Mr. Lyne? Yes.

15151. You knew that, and yet you did not take the trouble to read his speech on this particular matter before you formulated that charge? I —

15152. Did you or did you not? No, I did not read his speech. I would like to make an explanation here. I spoke to Mr. Lyne privately about this matter. He said to me, "I forget the incidents of the case, but I must have acted upon the recommendation of my officer. But why don't you get the papers." I pointed out to him that the papers were not in the Parliamentary return; and the first thing I did when the Commission obtained the papers from the Public Works Department was to look for these papers. I found a minute from Mr. Davis, written to Mr. Griffiths, of the Water and Sewerage Board, stating that all the papers in connection with the letting of Contract 79A are lost, and therefore the certificate on which the contract has to be paid will have to be made out without them. You will find that amongst the papers. So that, really and truly, if I had read Mr. Lyne's speech, I should have had to wait until the information came before the Commission before getting the fullest facts.

15153. If *Hansard* is correct you were in the House when Mr. Lyne made his speech? In what way?

15154. In the next column but one, page 1209, referring to Johnstone's Creek, Mr. Lyne says,—

I presume that what is referred to is the sewerage work further up in Johnstone's Bay, which comes down from the head of the creek; but that has nothing whatever to do with the work that is going on upon the mud flats at the output at Johnstone's Bay. I may be wrong in gathering what the Honorable Member referred to, but I took it that he meant—

You interjected here, "The stormwater canalling"? I might have been there at the former portion of his speech, or might have just come in then; but I certainly did not hear the whole of his speech.

15155. You did not take the trouble to read it in *Hansard*? As a matter of fact, the only speeches I did read were Mr. Reid's and Mr. Young's.

15156. This is rather an important matter, isn't it? Yes.

15157. Is not a charge of inducing the Minister to let a contract in an improper manner rather an important matter? Yes; it is a general charge.

15158. I think it is a specific charge, isn't it? It is a charge founded upon finding information. Of course I laid before His Honor these charges with the full conviction that there was evidence amongst the papers to sustain them, from former knowledge; but they were never intended to hold absolutely good. They might be varied, and if they are wrong in any way I say to you "Produce these papers."

15159. That is not the point;—you made a charge without taking the trouble to find out what the Minister had said in his place in the House on the matter? I did it with the knowledge that there were papers in connection with the letting of this contract, and I asked you to let us have these papers.

15160-4. I do not know what papers you refer to? Where is the correspondence?



MONDAY, 31 AUGUST, 1896.

Varney Parkes recalled and further examined:—

15165. *His Honor.*] There is no other evidence which you wish to give before your cross-examination is continued? No; but I wish to correct my evidence in two particulars. I was speaking on Friday of inquiries I had made. I wish to say that I did ask your Honor to make inquiries of the Postal Department, and that you received this reply:—

V. Parkes.  
31 Aug., 1896.

[Urgent.]

Sir,

Postal and Electric Telegraph Department, General Post Office, Sydney, 23rd June, 1896.

With reference to the request made by you in your communication of to-day's date to be furnished, for the use of the Public Works Inquiry Commission, with copies of any telegrams which may have been sent by Mr. John Carter, of the firm of Carter, Gummow, & Co., to Mr. Frank Moorhouse Gummow, or to Mr. James Gillan, in Adelaide, during the months of April, May, or June, 1893, and to your inquiry by telephone respecting the matter, I have the honor to inform you that all telegraphic messages are only kept for one year, after which they, as well as any tapes on which they may be recorded, are destroyed.

It is therefore regretted that your request cannot be complied with.

I have, &c.,

S. H. LAMBTON,  
Deputy Postmaster-General.

The Secretary, Public Works Inquiry Commission, Chief Secretary's Office, Sydney.

That contains the same information as I gave in my evidence. In the other case I said I received information from Reid, the Inspector. I find that I did not receive information from him prior to the Commission being appointed. He called upon me and spoke to me about matters, but he declined to give me any information, except to state that he could give information, and I did not get that information until he appeared as a witness here. I want to correct my evidence in that respect in justice to him, though I knew from other people that he was going to give certain information.

15166. *Mr. Smith.*] Do you know the Christian name of that Mr. Webster? I do not.

15167. You cannot tell us his Christian name? I could to-morrow, by looking up his letter.

15168. I think when the Commission adjourned on Friday we were on the speech of Mr. Lyne, and you stated that you did not hear the whole of that speech? I do not think I did. I do not recollect it.

15169. Especially that portion which refers to Contract 79A? I will tell you why I do not think I heard the whole of it. In looking at the paper next morning I looked at the tail end, and I saw a paragraph in which Mr. Lyne said he did not know that Mr. Hickson's son was connected with the firm, and that is the only thing I saw of it that I can recollect.

15170. At all events, you were in the House during a portion of the speech? That is apparent.

15171. You were there just before he spoke, apparently? There is no doubt I was there during the first portion of his speech.

15172. But you were there when he referred to Contract 79A? I do not think so. If I was I did not hear him.

15173. After referring to Contract 79A, Mr. Lyne, at page 1208 of *Hansard*, goes on to say:—

If I remember rightly, on that occasion, I should state in fairness to the Engineer-in-Chief for Public Works, I do not think that he advised me to do this work. I think that his advice to me was in accordance with the minute which has been read to-night, and that was, if anything, against doing the work in this way. But I considered that I was justified in the course I took, and I therefore took it. I am responsible for it, and I am satisfied that the work is well done.

You do not remember hearing Mr. Lyne say that? No; but I recollect that conversation in which he said to me, "You will find all the information concerning that in the papers." I have the document, which I referred to, about these papers. The document is as follows:—

Department of Public Works, Engineer-in-Chief's Office, Sydney, 28 August, 1895.

MINUTE PAPER.

*Subject.*:—Contract 79A, North Sydney Sewerage.

As these works have exceeded the estimated cost, it would be as well to have the papers approving of the extensions in High-street at schedule rates.

T. GRIFFITHS,  
Supervising Engineer, Metropolitan Sewerage Construction.

Engineer-in-Chief, Metropolitan Sewerage Construction.

Mr. Adams.—Obtain and attach papers.—C. D., 28/8/95. I have tried to get these papers from the Works Department, and was told they cannot be found.—S. ADAMS, 28/8/95. The Engineer-in-Chief. Are the papers with the Board? Let me see the contract documents.—C. D., 29/8/95. The Under Secretary, Public Works. Mr. Davis for papers required by Mr. Darley.—Jno. P., 29/8/95. On inquiry I find that the bond referred to was handed over to the Metropolitan Board of Water Supply and Sewerage, with others, on 28/6/95.—T. P., Principal Assistant Engineer, Country Towns Water Supply and Sewerage, 3/9/95. Engineer-in-Chief, Metropolitan Sewerage Construction. As the papers cannot be found we must pass in the voucher without them.—C. D., 5/9/95. Vouchers herewith.—T. G., Supervising Engineer, Metropolitan Sewerage Construction, 7/9/95. Engineer-in-Chief, Metropolitan Sewerage Construction. Voucher for £194 15s. 2d. forwarded to the Treasury on the 10/9/95.—S. A.

I presume they never have been found.

15174. I am not referring to any papers which cannot be found; I want to draw your attention to the papers which are before the Commission;—you say that Mr. Lyne said that it was on his responsibility that this extension was ordered? That is so.

15175. And he says that a reference to the minute will bear that out? He says so here.

15176. At page 1201 of *Hansard* do you see Mr. Hickson's first minute of 22nd March, 1894? Yes.

15177.

V. Parkes. 15177. It is a minute by Mr. Hickson substantially to this effect—that he cannot recommend that the contract be carried out as an extension at schedule rates? I rather think not seeing that the work is 50 per cent. cheaper.

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15178. You need not interrupt me, Mr. Parkes. Is that not so? Yes.

15179. But he goes on to say "I believe, however, if tenders were invited we could get the work done under the office estimate." That is so? Then I say why—

15180. Never mind what you say. Answer my question? Yes; but anybody may write a minute like that. A man who writes a minute like that—

15181. I would ask you not to go off. I want to deal with the minute as it stands. That is the effect of it? Yes.

15182. He does not even recommend the calling of tenders for the work. He simply says "I believe if tenders are called the work will be done under the office estimate"? I should take that as a recommendation.

15183. You go on to say "It was about this time that Mr. Hickson, junior, became a member of the firm"? I did.

15184. That of course we know is not the case? No, I was in error.

15185. Then you go on to refer to Mr. Hickson's minute of 29th March, which begins in this way—"Referring to the Minister's intimation this morning that he was prepared to let Messrs. Carter & Co. carry out this work as an extension"—that is what he says? Yes.

15186. So that he clearly refers there to an intimation which he had had from the Minister? Yes; but I should have thought that he would have protested if he knew that the work could be got cheaper than the office estimate.

15187. So you see that Mr. Hickson refers to a distinct intimation which he had from the Minister to a certain effect? Yes.

15188. I suppose an intimation coming from a Minister of the Crown in charge of a Department amounts to an instruction to an officer? You must remember—

15189. Does it or does it not? It is a matter of opinion—I could not say that it is.

15190. Would you not think so? I could not tell you; but from Mr. Barling's evidence it is quite clear that Mr. Hickson and Mr. Lyne had private interviews about this matter.

15191. I am not talking about private interviews. I am referring to the minute now. The intimation was to the effect that Mr. Lyne was prepared to let Carter carry out the work as an extension, provided that they agreed to do so for the Departmental estimate? Yes.

15192. This concession to do it is an extension of the existing contract at the schedule rates, but they were to come down to the Departmental estimate—that is clear, is it not? Yes. But the Departmental estimate is about a fair proportion of the other because it is a cheaper contract.

15193. Then Mr. Hickson goes on to say—"I had an interview with Mr. Carter, who is prepared on the part of his firm to comply with the Minister's decision"—is that not so? Yes.

15194. So you see that the minute itself says that that was the Minister's decision which Mr. Hickson was instructed to communicate to these contractors—is that not plain? Yes, it looks to be so.

15195. That being the concession, how do you charge Mr. Hickson with a sudden change as you do in the next line? It is a sudden change, comparing these two minutes together. One cannot comprehend a man who writes a minute so positively as that first minute being so weak as to give away his position by writing the other, if they were sincere minutes; and they appeared to me not to be sincere minutes.

15196. That is your explanation? Yes.

15197. But it is quite clear that you were in error as to your premises, namely that Mr. Hickson came into the firm between these two dates? Yes.

15198. That might have had something to do with coming to the conclusion which you still hold—is that not so? No, it is not indeed.

15199. But in spite of the removal of that error from your mind, you still think that that is the effect of these two minutes fairly read together? Yes; because I think Mr. Hickson should have understood—in fact I take it that it is required by the Public Works Act—that all public works must be tendered for. It showed a compliance on his part to the Minister's will which to my mind is not the action which he should have taken.

15200. I suppose you knew as a matter of fact that it was not an unusual thing to grant extensions of contracts to contractors without tendering? I think it is, and ought to be.

15201. Is it, or is it not,—do you know of any others? I do not know of any others, except one; in fact, you will see that I moved for a return of these contracts. I only know of one granted to Gilliver, and another granted to somebody else.

15202. One of these men who waited on you with this grievance—that they had not a fair cut at the tender-box—himself admitted that he had a large extension of a contract without tendering? Yes; but he explained the reason why.

15203. That was Mr. Gilliver? Yes.

15204. That was the Rookwood contractor? Yes; but he explained the reason why. He did not receive this extension at office rates, but at competitive rates. This extension is given at office rates, and that is the difference.

15205. At page 1201 of *Hansard*, referring to the North Shore contract, you said:—

They received their contract under a schedule tender, and their sureties, as usual, were those of their own firm.

Did you say that? Yes; it is an error.

15206. In this case, I think, there was a cash deposit of £2,000? It is an error, which I freely admit.

15207. To that extent it is misleading the House? That was my information at the moment, but there was no intention of deceiving the House.

15208. But you say "as usual"? Yes.

15209. Now we come to Contract 77, which relates to the Monier arch. At page 199 of *Hansard* you say:—

Fifteen firms of contractors tendered for the works at Balmain at schedule prices, and the lowest tenderer was the firm of Messrs. Carter, Gummow, & Co. These contractors sent in a price ridiculously low as compared with the fourteen other firms tendering. Their tender was 28½ per cent. under the schedule prices. The next was 18½ per cent.

You said that? Yes.

15210. That is not so, having regard to the next tender being 18½ per cent.? No; but you must remember— V. Parkes.  
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15211. There were two between, were there not? You must remember that I was speaking in the House, not from official documents, but from information which I had received. I cannot get at official documents.
15212. You had been told that the next tender was 18½ per cent.? I presume so.
15213. But that is not the case, we now find? No; 25½ per cent. McSweeney's was.
15214. Would you call McSweeney's a ridiculously low price? I think it was a low tender.
15215. A ridiculously low one? A low tender for that work.
15216. It was not only Carter, Gummow, & Co. who sent in ridiculously low estimates, but McSweeney did the same? Yes; he sent in a low tender, seemingly.
15217. At the bottom of page 1200 you quoted the minute of Mr. Hickson as to not taking out the quantities? Yes.
15218. And then you went on to say:—  
The sole reason was that quantities so much less would have been shown, and instead of the contractors making a profit of £2,000 they would have been cut down to a proper estimate of the value of the work.  
Did you say that? Yes.
15219. Did anybody tell you that the sole reason for not taking it out was as alleged by you there? The contractors who came to me said that they looked at the nature of the work—that they had looked into the work, that they had themselves taken out the quantities roughly, and that they were convinced that they could have done the work at £3,000 less than Carter's price.
15220. Did they say that the sole reason for not taking them out was as you stated there? What?
15221. To avoid showing the quantities so much less? No; I put that in myself. That is my own opinion.
15222. There was no evidence about that—that was your own inference, or the conclusion you drew from the statements made by the contractors? That is my own opinion, because I cannot understand why there should have been any hesitation about submitting it to the Minister in the schedule form.
15223. You came to that conclusion although you had the minute before you stating how it came about? Yes.
15224. With regard to this Monier system we have heard so much about, when you made your first speech in September, had you seen a specimen of this work anywhere? No.
15225. Had you seen a specimen when you made your speech in May? No.
15226. Had you read anything about it in any of those authorities which have been referred to here? I think I have.
15227. At that time. In September you had? Yes.
15228. Can you mention any one authority you had referred to on the matter? No; I cannot now from memory—in fact, I think I received an invitation from perhaps Mr. Carter and some others to go and look at the tests of it at one time.
15229. But you did not accept the invitation? No.
15230. Had you read any of the authorities such as were referred to by Professor Warren? I admit that I knew practically nothing as to the patent except the materials.
15231. I think in your speech in May you gave a graphic description—perhaps I ought to say a description—of this Monier system, although you say at that time you knew nothing about it? I did not give a graphic description.
15232. I withdrew the word graphic in obedience to the suggestion of His Honor this morning. You gave a description of the system, although you admit now that you knew nothing about it? But I did not give a description. I simply gave the object of it.
15233. You did not tell the House what the best description of it was then, did you? I simply gave an explanation of the object of it. I told the reason why the rods were inserted—that is, to make the structure light. I think you will see that is the meaning of what I said. I think I illustrated my remarks. I said, "If walls of houses were not strong enough, or the roof was too strong for the walls, it would need to be bound with iron rods. The iron gave strength to the thrust."
15234. At page 30 of *Hansard* on 12th May, 1896, you said—  
Yet the Government, under the Secretary for Public Works, allowed the contractors for a saving of £250 to substitute a scheme of their own consisting of cement arches which would not stand unless supported by tie-rod iron. The best description I can give of that to Hon. Members is to take this Chamber, and to suppose that the walls are so weak that they cannot sustain the roof, and the weight of the roof is sufficient to push out the walls. The first thing to be done under such circumstances would be to put in iron tie-rods. These arches are so weak that they cannot sustain themselves, and have to be tied with iron tie-rods. That is what the Minister allowed the contractors to substitute for his own good, permanent, plan.  
That is what you said? Yes.
15235. There you give the House what you call the best description of this system that you can give? Yes, that I knew of at the moment.
15236. And then at page 31 you go on to say—  
This patent with regard to the Monier arch, this useless, risky thing, was invented in Germany thirty years ago for ornamental work in gardens, and it was never intended for such work as I am referring to.  
Is that so? Yes, but I admit that I was in error there.
15237. I suppose you were equally in error when you told the House further on, "The Minister accepts this Cheap John thing on a report of that description"? No. What I meant there is that it is a cheaper construction than the office design, whereas, practically, the Government are paying for it the cost of the office design. It is rather strong language, I admit; but, of course, in speaking in the House one does not often use the very mildest language.
15238. Apparently not, or the most accurate language? I do not think that comment ought to be made. I might add that in the House of Assembly, unless a speech is made very emphatic, you will never get a Government to act upon it. It takes something to move an apathetic Government.
15239. You told us here on Friday that one of the reasons for making that charge in regard to Mr. Hickson so strong was that you wanted to induce young Mr. Hickson to come over? I would like to explain that. Young Mr. Hickson was a most essential witness to this inquiry. His father said that he did not wish him to come over—in fact, there was an objection to his coming over. I had certain information concerning him which I thought would be brought out in evidence. Now, in the first place I made up my mind not to put a charge in at all, but simply to bring evidence without putting in any charge, because it is not a nice thing, in regard to anybody's feelings, to put charges in that way. But when it seemed

V. Parkes. seemed to me that the inquiry in my case would fall to pieces if this witness did not appear, I worded that charge on just exactly what I thought the evidence would bear out—perhaps a little too strong. I withdrew that charge and substituted another. I substituted that charge more for that consideration than anything else.

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15239½. It was partly, then, as you said, with the object of making young Mr. Hickson attend? That was one of the objects.

15240. When you made these charges of corruption in the House, had you a similar object in view, namely, to move the Government to grant a Commission;—was that part of the reasons why you made these charges of corruption? No.

15241. Did you put that in as a means for asking the Government to give you this Commission? No; I believed that such was taking place.

15242. At page 1199 of *Hansard*, on 26th September, 1895, you said:—"I am assured by other contractors that whereas Messrs. Carter, Gummow, & Co. obtained a contract at £15,500, they would have been willing to carry out the job at £12,500 to £13,200, effecting a saving of from £2,300 to £3,000";—do you know who these other contractors were? Yes.

15243. Will you mention their names? There were very few of them there who did not uphold this.

15244. I only want to know whether you can tell me the names of them or not? I cannot tell you the definite ones.

15245. Was it Maddison? No.

15246. Was it Williams? I think Williams was one, but I could not be sure.

15247. Was it Gilliver? He was one of them. I am sure he said there would be a saving on the job.

15248. At this time you did not know anything about the Monier principle? I knew as much as was explained to me.

15249. By these contractors? Yes.

15250. By Mr. Gilliver, for instance? Yes; and from a definite knowledge I had previously.

15251. You heard the evidence of Mr. Gilliver as to what he said of the nature of the Monier work, did you not? Yes. I think he sustained in evidence what he had told me before.

15252. With regard to that statement as to the next tender being 18½ per cent. below the other, had you the paper in your hand at that time? What paper?

15253. The paper showing these tenders? No.

15254. Had not the Minister handed it to you? No.

15255. Are you sure of that? The Minister declined to give me any information when I saw him about this matter.

15256. What were the papers you were reading from during the September speech? I was reading entirely in this speech from notes that had been given to me by the contractors.

15257. And also from official papers? Where could I get them from?

15258. That is for you to say—does not your speech say it? What does it say?

15259. There is a minute set out *in extenso* at page 1200;—you evidently had the papers before you? That seems to be so.

15260. Are you not reading from official papers all the way through that speech? Let me see if there was a previous motion. I am wrong there. I asked a series of questions, and in answer to these questions Mr. Young had given me certain extracts from the papers, and that is what I am reading from. I do not think they included the tenders at all.

15261. You do not think the papers before you included a list of the tenders or the tenders themselves? No; all the papers I had were extracts given to me—extracts taken from that paper which was not printed at that time. It was not laid on the Table until the 9th October. I must have got these particulars from the Minister.

15262. *His Honor.*] You could not have had these particulars? No; the Minister must have failed to give me the tenders.

15263. *Mr. Smith.*] You say that when you made that speech you did not have either paper No. 2, as printed in this return, containing the list of tenders, or the tenders themselves—is that your evidence? One of the contractors told me.

15264. Will you answer my question in regard to the papers;—do you say that when you made that speech in September, you did not have either paper No. 2 or paper No. 3, printed in the return containing a list of the tenders, or the tenders themselves? I say I had extracts from them, but I had not the tenders. I could not have had them, because they were not laid on the Table of the House until the 9th October.

15265. I am not talking about the printed papers, but about the original papers? You will see, Mr. Smith, that they were laid on the Table of the House on 9th October, 1895.

15266. You say that you had not either of these papers? I could not have had them.

15267. Although you had the papers from which you have read these long minutes relating to these works? These must have been extracts which Mr. Young had given me, or extracts I had taken from some statements which he had given me. I should like to point out in my evidence that I was told by the contractors that Mr. Carter and Mr. Gummow had both stated that they made their tender low purposely because they had this Monier arch assured to them.

15268. Did they say that to you? No; Carter and Gummow did not.

*Mr. Smith:* Then I object, your Honor, to that going down.

*His Honor:* As you are now cross-examining Mr. Parkes as to the state of his mind, of course he is entitled to say what information he received from any source.

15269. *Mr. Smith.*] Who were the contractors who said Carter and Gummow had said this thing? I think it was known amongst a lot of them. It seemed to me that it was.

15270. Can you mention the name of any man who said it? I think Williams said it.

15271. Did Maddison say it? I am not quite sure.

15272. Did Gilliver say it? I am not quite sure. It would be difficult for me to tell you definitely who did say it, but they all seemed to know about it.

15273. They all seemed to know about it, but you are not able to say definitely who it was who said that? No; unless it be as I say that Williams was one of them.

15274. With regard to Contract 118, you told the House that one of the concessions granted to this firm of contractors was the draining the water off the land for the contractors? Yes. 15275.

15275. Did you know at that time that this land had become flooded by the action of the Government themselves? I did not know, but it did not matter very much, because—

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15276. From your point of view, it did not matter very much? No; because the contractors said it was provided in the specification that they were to unwater the work themselves whatever the contingency might be. I know myself that when a contract is let to two contractors one is not supposed to hinder the other; and a provision would be made by wise management to unwater the work at the expense of the contractors, so that there should not be an addition afterwards. This was a clear thing to me, and I made mention of it just as it was made to me.

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15277. So that, from your point of view, it did not matter a bit whether this water was taken on to the land by the Government or came from an outside source? Because the contractors were bound to unwater it.

15278. That was the conclusion you arrived at? The conclusion I arrived at was that if it was in the specification that they had to keep their works free from water and take all liabilities they would have to do so.

15279. You know that it was caused by the sand-pump dredging at Rozelle Bay? I do not know anything of the sort.

15280. If you did know that, it would not alter the conclusion you arrived at, viz., that this was a concession to the contractor? I think the contractors should have done their own unwatering.

15281. What were those contracts you referred to on page 1200? While speaking of that matter I may as well tell you of a parallel case. On a northern river—I think it was the Macleay—a contractor had to narrow and deepen a channel. There were deposits of perhaps a million years accumulation up in the river. By deepening that channel the scour brought all the sand away, perhaps it would take 100 years to fill it up; but an obligation on the contractor was to leave that channel at a certain depth. It would be simply impossible if the man stopped there for the rest of his life and his children were to stop there after him to keep that sand which has been backed up by nature from coming into that channel. Yet Mr. Hickson ruled that it was his duty to make provision against that most extraordinary thing, and the contractor had to throw up the contract.

15282. What contract are you referring to? It was a contract taken by a man named Ford; it might be at Lismore. I recollect the incident because I went with the contractor to Mr. Hickson to get his explanation, but he ruled that the Government contract could never be altered; and that since this man had taken this obligation, although it could not be performed, he must carry it out or throw up his contract.

15283. You think this is a parallel case? Yes.

15284. Turning to page 1203 of *Hansard*, what were the contracts you were referring to when you said As far as I am informed there was a contract of £31,000, another of £10,800, and another of £11,000, all let without tender.

? I was wrong in the information which I received. I think you will find that I corrected that statement in my second speech. There were three contracts let; but I was wrong in the amounts.

15285. You corrected that in your second speech. You said that there were three contracts, namely, £1,200, £2,000, and £12,000. What were these contracts? In 79A there is a further extension let of £1,800, and in Contract 79 there is an extension of £1,200. They are to be found in the Parliamentary papers.

15286. So that, as a matter of fact, all these contracts, it turns out, which were let without tender were extensions to one or the other? They were nevertheless contracts.

15287. They were extensions;—is not that so? No; they were branches to contracts. They were not by any means extensions.

15288. Neither of them? No; they were separate contracts, which could be carried out by separate contractors. Take this one which the Government accepted at £1,800. Of course it was readjusted afterwards, but let me show you how the total was made up. At page 369 of the Parliamentary return you will see how Mr. Weedon makes it up:—

767 lineal feet rock tunnelling complete at 36s. per lineal foot; 100 lineal feet rock tunnelling at 27s. per lineal foot. why should they adopt the contract by the lineal foot, when it was paid for by the cubic yard?

15289. You had better call Mr. Weedon and ask him? This contract if let by tender would, I guarantee, be done for about £1,000.

15290. At all events, these three contracts which you at first stated at that very high figure turn out to be either extensions or branches? They are by no means extensions. They are distinct branches.

15291. With regard to Contract 69, at page 28 of *Hansard*, on the 12th May, 1896, you say:—

I will prove that the most defective work has taken place upon this job.

You say that? Yes.

15292. What defective work were you alluding to then? I had evidence then, and was assured of further evidence, of defective work on Contract 69. I brought two witnesses out of some others.

15293. Are you referring to Benson and Darcus? Yes.

15294. Were there any other witnesses besides them at that time? That is one question, your Honor, which I should like to be allowed not to answer. I am trying to get a certain witness. I may at any time put my hand on a witness, and I do not like to anticipate.

*His Honor:* Mr. Smith is not asking you to give the name of the witness; he is only asking you to say if you had any more informants.

15295. *Mr. Smith.*] What is your answer, Mr. Parkes? I had other informants.

15296. You would prefer not to mention any names? You can see that, if I give away the names of the witnesses, I jeopardise any chance of producing them.

15297. I suppose your objection to mentioning their names holds only at this stage? You can ask me this question if you like at the latter end of the inquiry.

*His Honor:* It is quite legitimate for Mr. Parkes now to decline to give the name.

*Mr. Smith:* I do not want to leave a suspicion of a suspicion behind.

*His Honor:* What Mr. Parkes says is that he had some information. It is assumed that he has been doing his best to procure the attendance of those who gave it to him. He has not succeeded; he may succeed in the future, and if he does he will ask the leave of the Commission, if it is not terminated, to produce the witness, and, of course, I will grant leave.

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15298. *Mr. Smith.*] I suppose you would not consider the evidence which Benson gave as very important? I would. It is a very essential point. I have found that, where defective work is to be found in a small degree, you will find it everywhere. A conscientious contractor is a man who thinks of the risk to his business, and he is scrupulous in his work. If ever you catch a contractor doing defective work in small things, you may rely on it that he will do so in large things. If you find one instance of a defective joint in an iron pipe where the pressure is great, and the position important, you do not know how much of similar defective work there may be.

15299. The same with Dawson? I think he said there was too much stone shovelled into the concrete? Yes.

15300. In the same way you think that might be an indication of bad work throughout? There is other evidence which you are not citing. You are citing these two men, but there is other evidence.

15301. Which you have not called? Which I have called. For instance, there was the evidence of the shortage of cement, which I presume you will explain away, and the purchase and use of cement in these three works.

15302. When did you get that evidence about the shortage in the purchase of cement? I can tell you that amongst workmen in the city of Sydney it is a common thing for the men to talk about the way cement structures are carried on. Every man will tell you, I do not care where he is about the city of Sydney, that he can get a shilling a day extra if he can save a cask of cement every day. It is a bargain. It is a common thing. It is a matter of common talk amongst the men.

15303. It is on this common talk you based this charge here—is that it? I have myself—

15304. It is on this common talk that you base this charge, and say “I will prove it”? I did not base it on that. I based it on evidence which I have brought, and evidence which I will bring.

15305. In dealing with Contract 69 you gave the House certain figures. At page 28 of *Hansard* you say:—

Let me show hon. members how the case stands as regards this Contract, No. 69. The tenders sent in were Carter, Gummow, & Co., £45,207; John Ahearn, £47,061; Kerle and Kerle, £52,735; H. McKenzie and Sons, £53,505; J. F. Carson, £57,239; Dean and Sons, £58,165, and so on. The completed work was much less than in the computed schedules, but Carter & Co. were paid £52,400 instead of £45,000, or £7,400 over. They were paid, for instance, upon schedules numbered 1, 8, 12, 16, 19, 22, and so on. Supposing other contractors had had the same schedules passed for them to do the work under, there would have been a saving in the case of Ahearn, of £11,600; in the case of Kerle, of £5,000; in the case of Carson, of £10,052; in the case of McKenzie, of £8,700; in the case of Holloway Bros., of £5,700; in the case of Dean & Sons, of £4,520.

You said that? Yes.

15306. Did you make out these figures or calculations yourself which you gave to the House? No. There is no doubt that I looked through them.

15307. Who made them out for you? But you must remember—

15308. Will you answer that question?

*Mr. Parkes to His Honor: Do I need to answer that question?*

*His Honor: I think that is a fair question to ask.*

15309. *Mr. Smith.*] Who made them out for you? They were worked out by my instructions and on my basis.

15310. By whom? They were worked out by an officer in my employ.

15311. You mean in your regular employ? Yes.

15312. What is his name? It was a lady, who does all the work of the office. I have a lady as my private secretary, because she can do more work, and do it more accurately, than the boys can.

15313. I think you called Mr. Thompson here on this matter as a witness? Yes.

15314. His figures show that in only two cases would there have been a saving? Yes.

15315. These cases being Holland and Mackenzie's—is not that so? No; you are wrong in saying a saving. It is not a saving; it was a reduction below the ultimate cost to the country of Carter's work. On nearly every one of these contracts except three you will see a saving.

15316. I am only using your own words;—you told the House that there would have been a saving? A saving to the country.

15317. In all these cases a saving of so much? There would have been a saving of money if these tenders had been accepted.

15318. It turns out on Thompson's evidence that in only two cases there would have been a saving? Yes; but nevertheless in a number of cases they are greatly reduced.

15319. At all events, in regard to these cases mentioned, it turns out that there would be only a saving in two? But Mr. Thompson is working on the final payment, and on a very different basis from what I was working on. I was working on this basis, that if the information placed at the disposal of the contractors had been used, and certain schedules for heavy blasting rock which were put in had been left out, these contractors would have tendered on what was really the nature of the ground which was shown by the bores; or, as Mr. Holland told you, with the information so acquired they would have been able to do the work as it finally turned out at a certain price.

15320. Is Mr. Thompson working on a wrong basis? He is working on a more accurate basis than I was.

15321. It turns out that there would be a saving only on the two? Yes; but they are enormously extravagant prices under any circumstances.

15322. After giving these figures, which you say were prepared in the way you mentioned, you say at page 28 of *Hansard*:—

Will Honorable Members dare to say that there was not some collusion between some officers of the Department and Carter & Co., in order that they might fix their schedules?

you said that? Yes, I did, and I maintain it still. They never could judge on the prices given by this schedule. No man could have made up a schedule like this without some officer of the Department had given him information. I am as sure as I am alive that the schedules could never have been made up unless the man who tendered stood to be ruined by this schedule.

15323. On these figures you ask the House whether any honorable member would dare to say that there was not some collusion? Yes; for very good reasons. While this was apparently a cheap tender it was a very costly one.

15324. It turns out from Mr. Thompson's figures, which are made out on a more accurate basis, that your figures were not to be relied upon for that purpose? No. His are taken out on a different basis. Another thing is that his figures back-up exactly my contention in the House.

15325.

15325. On his evidence, will you dare to say now that there was collusion? I am not the Commissioner; but if you ask me if it appears to me that there was, I will say that it does appear to me that there was.
15326. You think that is a fair inference to draw, having heard his evidence? It appears to me that an assurance was given to these contractors that certain items would be paid to them.
15327. That is what you mean? Yes; because this is not rigging a schedule. Rigging a schedule is taking adventurous risks in adjusting all items. Where you get 27s. 6d. repeated constantly, they must have known the items. They would not have taken these risks if they had not known something about it. I will point out another thing: The item of timber is 9,000 feet in the schedule. According to item 21, at page 62 of the Parliamentary return, it was increased. The timber paid for is 9,800 feet; so that the excavation in this soft ground must have been calculated for; yet there is not the corresponding quantity in this. There is a great deficiency in the quantities of excavation if that timber was correct.
15328. The same thing in regard to the subducts in this contract? Yes.
15329. Referring to the subducts, I think at page 29 of *Hansard*, you asked the House this question—"Will hon. members tell me that this was not a prearranged affair"? Yes; soft ground requires subducts.
15330. You have heard the evidence given here about the subducts? I have.
15331. And you still think it is a prearranged affair? It has not shaken my belief a bit; because, as you see, they have dispensed with subducts. If subducts are dispensed with in hard rock, that is all right; but here was the soft ground, and the very wet nature of the ground is seen from the flow coming from it now. If subducts were to be used anywhere, this is the nature of ground in which they should have been used. When anybody looked at this schedule, knowing that low bed of the Marrickville bottom, they must have known that water would have come in upon them. The water was coming in while the work was going on. If they had not information that these subducts would not be put in, they never would have put the price of a penny in their schedule.
15332. That is what you say, having heard all the evidence? Yes, unless they were mad. The evidence goes to show that they did not carry these sewers through rocky bottoms. Why are subducts to be used at all if they are not to be used in watered ground?
15333. Is Dawson the man you refer to, in your second speech, when you read a declaration? Yes.
15334. I think, in the declaration, he did not mention that he had done this bad work wilfully? No; he told me that he had been instructed to do it by the contractor's manager.
15335. He did not say that he had done it wilfully, with others, behind the back of the inspectors? No. I asked him whether he did it, and he said a man, if he wanted to hold a good place and continue on a sewerage contract, must pinch here and there. He told me, in fact, that he would have been discharged from the work if he was not able to do this.
15336. Did he say anything about the Government inspectors? Yes; he said the Government inspectors were a lot of men who were quite incapable of keeping the men from doing wrong.
15337. Did he tell you that he had done this behind the back of the Government inspectors wilfully? He said there was no inspector to see the work—that it could be done as much as he liked.
15338. I think he stated behind the back of the inspector? He said there was no inspector there to see the work.
15339. You heard his evidence here? Yes; I am not quite clear, but I think his evidence was what he told me.
15340. It was as you have just stated it to be? I have not the evidence to compare it.
15341. It was done under the instruction of the contractors' manager? That is what he told me.
15342. And that the Government inspectors were not there to see him do it? He said the Government inspectors were not there.
15343. How did you come to make out that it is a concession on that evidence? I do not mean exactly that it was a concession directly; but, of course, there are some of these charges which I gave you in that letter which I will withdraw. In this particular instance I looked upon it in this way: I thought it was a mistake to take Inspector Reid from that work. If this bad work was going on, and Inspector Reid was upon the adjoining contract, and could have come on to this contract, he would have prevented it.
15344. Did Dawson tell you that Reid had been dismissed—did he mention that among other things? No; he told me that an Inspector Reid had formerly caught him doing bad work, and that at Carter's request he had been removed from the job.
15345. That is what Dawson told you? Yes.
15346. I think you tried to get Dawson work? I have got him work.
15347. Since he gave his evidence here? I tried to get him work, and I got him work.
15348. On a Government contract? I tried to get him work on a Government contract.
15349. But they would not have him? He is blackballed everywhere, I believe.
15350. I suppose he would be, would he not? I do not know about that. I do not think it was his fault if he was compelled to do the work.
15351. You think a man who has admittedly done wilfully fraudulent work is a fit man to employ on a Government contract;—is that so? No; but the same man might, if he was allowed to do the work himself, without being pressed to do bad work, do exceedingly good work; and the fact that Carter, Gummow, Co. kept him for eight years on the job shows, either that he was doing defective work in their interest, or that he was a good worker.
15352. Having heard his evidence, you still think that he is a proper person to employ on a Government contract? Yes; I think the man has a right to get on a Government contract. He has admitted his fault, and certainly would not do the same thing again.
15353. At page 1198 of *Hansard*, in your first speech, you set out there a notice of dissolution of partnership? I did.
15354. You see it is dated 1st April, 1895? Yes.
15355. It sets out that the partnership lately subsisting between certain undersigned persons is dissolved? Yes.
15356. Do you see Mr. Hickson's name amongst the names? No; but supposing he was a partner, would his name be amongst them?
15357. I only want to know whether your attention had been drawn to that? Yes.
15358. You relied on that for evidence to a certain extent for your own purpose? I relied upon that as evidence that the two sureties, Forrest and Gillan, were belonging to the firm of contractors.



- V. Parkes. 15359. Having read that, you informed the House upon the same day that Hickson was a partner? Did I say a partner, or did I say I was told that he was a partner.
- 31 Aug., 1896. 15360. At page 1201 you said that it was about this date that young Mr. Hickson was taken into the firm? That might be as an employee.
15361. That he became a member of the firm? I said that.
15362. At all events from that notice he was not a member of the firm? No. But you see if a firm is split up to become contractors and sureties, and sureties and contractors, alternately, you do not know who may be in it.
15363. *Mr. Andrews.*] Do you remember when you first saw Dawson? He came to me I think in the early part of March, 1896. I do not think I ever saw him in my life before March last. When he first came to me he told me about the defective work—he also told me about defective work elsewhere by other contractors, but he could not be sure that he could locate it. I said to him, “Unless you can do something definite do not give me any information at all. Unless you can absolutely prove it, do not give me any information.” He told me of the spots he could absolutely prove where there was defective work. And the spot which seemed to me to be the most conclusive and most extravagant was that North Shore work. I said to him, “An informer will have to be a very courageous man, and unless you are able to withstand all the calumny which will be cast upon you, and the blackballing you will get, you had better not give evidence at all.” He said, “I have seen so much bad work done that I think it is the duty of a working-man, even if he brings himself into trouble—and mind you, I told him at the time that he might get into trouble for doing bad work—to tell the honest truth about these things.” I sent him away to reconsider the matter, and then he came to me a second time, and I got Mr. White to draw out a declaration, which Dawson signed. I took it then that it was very conclusive that he was correct. He said it would be very difficult to locate the exact spots, but these ones he could locate, because they were near the shaft, and he noticed them when he was doing it. He was astonished himself at their audacity.
15364. Do you know whether he ever called at your office before that? Never.
15365. Did you ever write him a letter after that? Yes.
15366. Have you any idea what the date of that letter was? No.
15367. I understand that you object to give the names of other workmen who have told you about defective work? At the present moment.
15368. Have you subpoenaed them? I do not think so.
15369. Can you tell us how many there were? There was not a great number of them.
15370. Were there a dozen? I have had information from more than a dozen. When asked to come before this Commission they said, “No; they would sooner cut their throats first.”
15371. Do you know whether they were Carter and Gummow’s men? Yes; a good number of them worked for Carter and Gummow.
15372. The others were not? Yes.
15373. They have only given hearsay evidence? You must remember that it is a very difficult thing to obtain evidence at all. There is no doubt that two-thirds of these contractors who gave me information are sorry. You must recollect that it is not so easy to obtain information; and, although these men, in the first part of the inquiry, were very anxious to give information and all that sort of thing, the moment they saw how one witness was treated, and when it was pointed out to them by a fellow-workman the difficulties they were in, they would not come.
15374. What do you mean by the phrase, “How one witness was treated”? I mean that, when that man, or these other men, go to a contractor’s job, the man shakes his head and says, “Oh! no; the Government inspector here will never have you on this job.” If you would like I can give you the letter written to me by Dawson explaining the position he is in.
15375. You said a minute ago that the contractors, when they saw how the inquiry was going, objected to give evidence too? They all got very timid about it.
15376. Did you ever promise them, before the inquiry started, that you would not say anything about defective work? No; I did not promise them, but I will admit that I did not try in any way to cast them off. I did not try to intimidate them. I kept my own counsel about the defective work.
15377. Do you not know, as a matter of fact, they complain that you have got information from them, they relying that you would not bring the question of defective work before the Commission at all?—
15378. Mind, I do not say that you did it? It might be so; but I should consider it my duty to do it, irrespective of whether they complained or not.
15379. I understood you to say on Friday that Maddison and Ewing would not substantiate on oath what they told you, because they thought that by giving that evidence they themselves might get into trouble—that is, become pecuniarily responsible? I did not put it quite in that form. I said that, judging from their manner—and, mind you, they had protested that I was bringing up defective work—I came to the conclusion that I could get no willing evidence from them.
15380. Are they the only contractors whom you have to complain of in that way? A lot of them.
15381. Of the lot? Yes.
15382. Not only of Maddison and Ewing, but of all of them? Yes.
15383. You often talked in speeches, and here, I think, representing these as fourteen contractors? Yes.
15384. Do you not know, as a matter of fact, that they are mostly all partners—that there are about three firms? They must be about the only firms in the city that divide all the work.
15385. That might be;—you do not know that? If such is the case—
15386. The fourteen reduces these down to about three firms? If such is the case, and it was known, the Department long ago ought to have put an end to this sort of tendering. I do not know that they are.
15387. You said in answer to a question on Friday that it was either Dawson or Ewing who told you that young Hickson came over here with Gillan from Adelaide;—can you remember now which it was? I think many spoke to me about it as well. I have thought that matter over. I really think that both Maddison and Ewing and Williams told me that. But with regard to that matter of his coming over, I mentioned that, not with any object of making that a point, that there was anything wrong about his coming backwards and forwards, but with the object of showing that Mr. Hickson must have known through his son that Gillan was a partner in that firm.
15388. But your information was wrong on that point, and they did not come;—what I want to find out is, which of these told you, if you can remember it? I think I was told by the lot of them—Ewing, Dawson, Williams, and Maddison. At the same time I do not wish it to be thought that Dawson ever came to me with these contractors, because he did not. I kept them all well separated. 15389.

V. Parkes.  
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15389. It is likely that Dawson would tell you—I mean, how would he know;—he was supposed to be a workman on North Shore, wasn't he? Yes; but these workmen do not walk about with their eyes shut. They know what is going on on a contract.
15390. Do you think that he ever saw Gillan? If he was eight years with the firm I expect that he did.
15391. But he was not? How long was he?
15392. He was eight years with Carter & Co.? I presume he would know Gillan.
15393. On Friday you also said that if it had not been for the evidence of Carter and Gummow you would have believed that Mr. Hickson was not a member of the firm, and of that evidence you are now doubtful? Yes.
15394. Will you point out what part of the evidence convinces you of that? I could tell you generally.
15395. Will you do so? Mr. Carter's admission that young Mr. Hickson had conversations with him.
15396. Mr. Gummow's admission? Yes, and Mr. Carter's too. Yes, and also Mr. Gummow's statements of his proceeding to Mr. Hickson to report how his son was getting on, and other things, which led me, or which do lead me, to suppose that they were on a very close acquaintanceship. If young Mr. Hickson, as Mr. Carter stated, was constantly conversing with him about his becoming a partner, it seemed to me that it was very likely that he might have the promise of a partner's interest.
15397. You stated that the evidence of Carter and Gummow lead you to believe now that young Mr. Hickson was a partner? I should be glad if you will allow me to look over this evidence, and to ask me that question on Wednesday. There was something which occurred when Mr. Carter gave his evidence which led me to say that, and if you will wait till Wednesday I will tell you what it was. If I can look through the evidence it will refresh my mind.
15398. Another reason you gave for imagining that he was a partner was that they had not kept books? Yes.
15399. Do you think the simple fact of keeping books will show that? I do.
15400. How? Because the partners' interest must be shown in the books.
15401. Why? In the bank-books, which are given, the salaries of each member of the firm, including young Mr. Hickson's salary, run through them uniformly. There are cash sums—very extensive cash sums—constantly drawn out, where there are no means of tracing, which could not be kept in hand unless there were some books to keep them. In looking through the bank-books you can account for perhaps a half of the money, but for one-half at least you can never account without there were books. You cannot tell where these papers are, or what became of the money; you can see clearly that the sums go to Maddison, Ewing, Rogers, and Snodgrass, when they leave, but you cannot account for the others. It appears to me to be impossible to carry on a business without books. You could conduct a small business without books, but not an extensive business where there are so many claims and cross-claims, liabilities in actions at law, and all sorts of things which absolutely make it necessary to keep books.
15402. Have you had a large experience with contractors? Yes; a good experience.
15403. Don't you know that it is almost the universal thing for them not to keep books? No; I know that the large contractors I have had to deal with have been most scrupulous in keeping books and also keeping a clerk to keep the books.
15404. It is totally different from my experience? I know very well that I have called upon contractors at times to produce books to establish their charges, and they have done so. At all events, in regard to that, I asked a great number of contractors and they told me that they do keep books, most of them. Small contractors such as Gilliver—but he is not a small contractor—keep a set of books.
15405. Gilliver destroys them immediately after he finishes his jobs? I do not know that.
15406. He said so? No. He said he destroyed his pay-sheets.
15407. He said he destroyed his books? He does not destroy his ledgers. There is no business in the world so difficult as a contractor's as far as the financial matters go. A storekeeper could better keep his accounts going without books than a contractor.
15408. In this investigation you say you could trace what Maddison and Ewing got as their share of the partnership? I cannot trace that exactly, but I can see where they got sums to leave the firm—such as £1,500 in one case, £1,000 in another, and £2,000 in another case.
15409. Does that not show that they only got a sixth of the profits? A seventh.
15410. Does it not? Yes; but that might be a seventh on Contract 69.
15411. Was it not a seventh on all the profits earned up to that date? I understood from Maddison and Ewing that they received £1,500 as their share of the profits on Contract 69, and I think the bank-books will also bear that out.
15412. They got no profits on Contract 79A? On Contract 79 I presume they would, but not on Contract 79A. Perhaps it might have been the profits on both Contract 69 and Contract 79.
15413. And Adelaide? Adelaide is a separate account as far as we can see in the bank books.
15414. Still they got their share of the profits? I do not know that they did.
15415. They never complained to you that they have not? No; but they told me, if I recollect aright, that was what they had to draw out of Contract 69.
15416. If they got their one-seventh share of the profit, where was Mr. Hickson's share of the profit to come from without he was paid by the other partners? I could not tell you that. As I say, you cannot trace one-half of the money that was paid into the account of Carter, Gummow, & Co.
15417. Do you think the partnership would be of this style—that Maddison and Ewing were to get a seventh and the remaining partners were to pay Hickson his share of the profits? Yes. But how do I know that it is a seventh? I only said a seventh because there happened to be seven members in the firm as put down here.
15418. As a matter of fact, did Mr. Christie report to you that there was a seventh—that they got their share of the profits, and that it was a seventh? He did not report anything at all about it. I instructed Mr. Christie to try and find out exactly what were the profits on these various contracts, and he found that one merged into the other; that with the pay-sheets drawn out as you are doing in Contract 77 and Contract 118 it was simply impossible to tell what the profits were. That is another reason why he came to the conclusion that there must be books, because you must separate these contracts.
15419. Since the start of the Commission you have seen the work at Johnstone's Creek on the Monier system? Yes.
15420. Do you still consider that the expression you used in your May speech, that the irons were to keep the defective arches from falling, is correct? In a certain way it is, because the iron is the strength. It would be no good without the iron.

- V. Parkes. 15421. Is not that what is claimed as an advantage of the system? Yes.
- 31 Aug., 1896. 15422. What you call in that speech defective arches is one of the beauties of the system? I did not say defective arches. I said as the structure was made light enough not to be self-sustaining it would need iron as an assistant.
15423. In that speech, at page 30, I understood you to say that these rods were simply used to protect the defective arches? The illustration was a long span with a fair weight, and insufficient sustaining strength with it. It is not a very good description. Very likely I could have used a better one. I used it because it happened to be convenient.
15424. *His Honor.*] The real fact is that at the time you suggested this simile or analogy you did not know what the Monier system really was? No, I did not. I knew its application, but I know that the iron went into the compo.
15425. You had not thought out its real scientific action? No, it was only the bearing of the thing that I wanted to point out. The point I was making was that if these iron rods rusted or became defective, with everything dependent upon them, the structure then was at hazard. It is quite true that I did not understand it then as I understand it now.
15426. *Mr. Andrews.*] The lightness was supposed to be one of its beauties? Yes.
15427. And a saving of material? Yes, of course economy is the chief thing.
15428. In regard to Contract 69, in reply to Mr. Smith this morning, you stated that the schedule was so filled up that it conveyed to your mind the impression or the certainty that they must have had inside information? Yes.
15429. Is it not possible that a man with a good local knowledge and a large experience of these works would be able to gauge what that schedule represents? Yes; but everybody has a local knowledge of Marrickville.
15430. Everybody cannot apply it? There is the bore put down at, say, every 100 yards. Every shaft goes right through the shaft excavation until it comes to the rock. There can be no doubt about the information to be had. Supposing everybody knows that. There is no contractor in the city—not one of those who were tendering—who did not know that it was a Wyanamatta shale country. Where the rock crops up there it is seen in the hillocks. No one could make a mistake about it. The plans are accurate as far as they go. The work carried out was the same. Anybody who put in £50 for the item “bluestone pitching” must have had it in their minds that such a thing could never be accepted; that it would be sent back.
15431. It was accepted? Exactly. I will ask you, Mr. Andrews, whether you or any reasonable man would expect that tender to be perused and accepted upon these items.
15432. Notwithstanding these bores, do you not think that a tenderer may have local knowledge which would assist him in making up that contract? I do not think that anyone has a special local knowledge of that district. There is Mr. McSweeney who tendered. Mr. Ahearn is doing work out there. Have Carter & Co. a better knowledge than these men.
15433. Is it not a fact that one man from certain data will be able to give a better estimate, or a better calculation of what will result, than another? That might be in the ordinary way. He might put in a rational profit of say 15 or 20 per cent. on an item. But when it comes to putting on 500 per cent., or 200 per cent., and reducing others correspondingly, it would never do. There could have been no calculations made at all. It is clear that the other men did calculate, but in this case there could not have been any calculation at all. That is why I say there is a suspicion. Take, for instance, at page 67 of the Parliamentary return, item 12, the Government put down excavation (soft)—this is where blasting is used in the tunnel—at 10s., but Carter & Co. put it down at 4s. The Government put another item, “excavation less hard,” at 10s., but Carter & Co. put it down at 40s. It seems curious that they are paid. Why not have “heavy” with “less hard”? They are all paid on that 40s. The two items seem the same. Would any contractor venture to put 4s. there when the Government could have availed themselves of their right to pay them at that 4s.
15434. I want to know whether local knowledge would not account for that difference? No; it would not account for the schedule.
15435. Do you not know, as a matter of fact, that in any branch of life special knowledge will allow men to do work considerably cheaper than others and yet make a profit? Yes, that would be all right if special knowledge allowed them to so tender that they could do work cheaper, but when special knowledge or special information, or whatever it may be, allows them to so arrange a price that comes out dear, then all may be wrong. For instance, how would you like to pay 27s. 6d. a yard for soft excavation?
15436. Would not their knowledge help them so that they could see that the charges they make on one would pay for the smallness on the other? No, it would not. For instance, take items 12 and 16, at page 76, in the Parliamentary return:—
- Excavation in road surfaces, soil, clay, pipeclay, shale, and soft rock only, where, in the opinion of the Engineer-in-Chief, blasting is unnecessary, 130 cubic yards at 4s.
- Less hard excavation in road surfaces, soil, clay, pipeclay, loose and jointy shale, and soft rock, where, in the opinion of the Engineer, blasting is unnecessary, 170 cubic yards at 40s.
- Practically the same—40s. When the payment takes place, the 130 at 4s. is reduced to 91, and the 170 at 40s. is increased to 539.
15437. Would not their prior local knowledge allow them to judge that that would be the result? What you mean is that their local knowledge would allow them to set a trap easily.
15438. No, I mean what I say. Would not their local knowledge allow them to judge whether the schedule was likely to be increased or decreased? No; this schedule suggests that they had no local knowledge—that they had not gone near the site.
15439. Are you prepared to say they had no local knowledge? No.
15440. Why do you say that? I am to judge from this schedule.
15441. You swear distinctly that a man having a local knowledge could not tell whether the items were likely to be increased or decreased? He might be able to tell that to a rational extent, but not to the extent this has been done.
15442. What do you mean by stating what improper concessions you think Carter, Gummow, & Co. have obtained have been proved before this Commission? That is for His Honor to say.
15443. *Mr. Smith.*] You referred this morning to some papers that were missing—I mean the papers approving of the extension of High-street at schedule rates. You referred to a memorandum which is dated 28th August,

August, 1895, being a minute by the supervising engineer. Following that minute there were other minutes, and then you referred to this one: "As the papers cannot be found, we must pass in the vouchers without them," signed by Mr. Darley on 5th September, 1895. Are not these missing papers you refer to the same as paper No. 23, printed in the Parliamentary Return at page 370? Yes, I think you are right. These papers refer to High-street, and not to 79A.

15444. It appears they were missing for a time, and have since been found and printed with the others? You are right, and I am in error. These papers refer to High-street; but that does not get over what I say, that there ought to have been some authorisation of this work more than the minutes which are placed in this paper. I was led, by what Mr. Lyne said, to suppose that there were, but in that case I was wrong.

15445. When you say, "By what Mr. Lyne said," you mean what was said in that conversation you had with him? Yes; in fact, he was looking over the documents himself and he said, "Show me where the correspondence, as to letting that Contract 79A, appears in these papers"? I showed him this, and he said, "That was not all that took place; where are the other papers;—if you get the other papers, you ought to be able to see exactly what the transaction was." It was not quite clear in his mind. He had forgotten.

15446. *His Honor.*] After that cross-examination, Mr. Parkes, do you wish to add any evidence, as far as any re-examination of yourself is concerned? No, your Honor, I have nothing further to add.

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WEDNESDAY, 2 SEPTEMBER, 1896.

Varney Parkes recalled and further examined:—

15447. *His Honor.*] I understand that you wish to make an explanation as to your answer to question No. 14955? Yes. The reply which I should have given to that question was that I did not hear Mr. Maddison absolutely deny having told me that the telegram referred to had been sent, but that I had heard him partially deny it.

15448-9. That is all you wish to say as to that? Yes.

15450. *Mr. Smith.*] You say now that a partial denial was given by Mr. Maddison of the statement you attribute to him? Yes.

15451. At all events, you heard him say this: that up to 1895 Mr. Hickson, junr., was not a partner in the firm to his knowledge? Yes, I heard him say that, and I do not think that in my speech I said any more.

15452. Then Mr. Maddison was asked, "Did you ever make a statement to the effect that Mr. Hickson, junr., was a partner in the firm?" and his reply was "Certainly not"; you heard him say that? I heard him give that evidence.

15453. He was then asked this question: "Never to anyone?" and he said "Never"; he also said that if that statement had been made upon his authority it was untrue. You heard him give that evidence? Yes; I heard him give that evidence, but my answer to that is this: That in his evidence he did not deny that he had given information indicating his belief that young Mr. Hickson was a partner after he left.

15454. At all events you heard him say that he did not undertake to obtain a copy of the telegram referred to? I did hear him say that.

15455. *His Honor.*] Do you wish to add anything after that cross-examination? Yes. Mr. Maddison was requested by me to obtain a copy of the telegram. He asked me by what means he could get it. I told him that he could do so by application at the Post Office. It was understood that on making that application he would be able to get a copy of the telegram. It was also understood that when the proper time came I would assist him in getting it. Mr. Maddison was positive, at the time, of the existence of the telegram, and he said that its existence could be proved if a search were made at the General Post Office.

15456. Neither of you knowing at the time that after twelve months telegrams would be destroyed? No; we thought a record would be kept of every telegram.

15457. *Mr. Smith.*] What do you mean when you say it was understood that Mr. Maddison would obtain a copy of the telegram? I mean exactly what I say.

15458. But he denies having ever undertaken to produce a copy. According to you, therefore, in making that denial he cannot have been speaking the truth? That is rather a hard way of putting it. A man might say, for instance, that he would identify a telegram if it were put before him, or that he would make every effort to obtain a copy or to assist in obtaining a copy of it, or that he would give the necessary information to assist in getting a copy. He might say, for instance, that he was so positive of the telegrams being in existence that he would be prepared to render every assistance in getting a copy of it.

15459. Do you still say that Mr. Maddison undertook to get a copy of the telegram? Yes; but, in answering that question, I desire to make this explanation, that in undertaking to get it he could only undertake to avail himself of every means at his disposal. What he said amounted to this: That, if such a thing were obtainable, he would get a copy. I remember distinctly asking him whether the telegram could be produced, and I remember his saying that it could, and that he could get a copy.

15460. When, therefore, he says that he did not enter into such an undertaking, he is not speaking the truth? As far as I know he is not speaking the truth.

15461. That is what I mean when I say that you now find Mr. Maddison not to be the reliable authority which you told the House he was? What I perhaps ought to have said was that I had an assurance of the existence of the telegram

Joseph Davis recalled and further examined :—

- J. Davis. 15462. *Mr. Hickson.*] How long have you been in the Government service? Thirteen years.  
 15463. You have been connected with sewerage works during the whole of that time? Yes.  
 2 Sept., 1896. 15464. It was I, I think, who placed you in charge of all sewerage contracts in 1890? Yes; at the beginning of 1890.  
 15465. And you held that position until the reorganisation of the Department in April, 1895? Yes.  
 15466. When the sewerage works were handed over to the then President of the Water and Sewerage Board, Mr. Darley? Yes.  
 15467. You were at that time appointed Principal Assistant Engineer for Country Towns Water Supply and Sewerage? Yes.  
 15468. And you held that position until April of this year? Yes.  
 15469. You then went back practically to your old position? Yes.  
 15470. For how long? For three months.  
 15471. And then on the reorganisation of the Service generally by the Public Service Board you became Engineer-in-charge of all sewerage works in the Colony? Yes.  
 15472. You are really at the head of the branch? Yes.  
 15473. You are also a member of the Board of Reference? Yes.  
 15474. And you are a member of the Institute of Civil Engineers? Yes.  
 15475. *Mr. Smith.*] In regard to Contract 69, let me direct your attention to two of the charges which have been made by Mr. Parkes—one charging the Department with manipulating the schedule of Messrs. Carter, Gummow, & Co., the contractors, so as to give them an advantage over the Crown by paying them on the extravagant items of charge, and conceding those items upon which they had a losing price, and in defiance of the terms of Messrs. Carter, Gummow, & Co.'s contract with the Crown; the other charging them with paying to the contractors large sums of money which they—the departmental officers—were not compelled to pay under Carter, Gummow, & Co.'s contract with the Crown. They are two of the charges affecting Contract 69. I believe you have gone into those matters? Yes, carefully.  
 15476. And you have drawn up a short statement of the facts relating to them? Yes.  
 15477. The three items chiefly referred to are the bluestone pitching, the cement rendering, and the omission of the subducts? Yes. I am not sure about the cement rendering, but I think that is also referred to.  
 15478. You have gone into these several matters? I have; and I have put down on paper my ideas in reference to them. I thought that would be the most convenient way of putting my views before the Commission.  
 15479. *His Honor.*] I understand that what you have prepared is a short statement of fact—that it is not an argumentative statement? Yes; I have abstained from argument as far as possible.  
 15480. *Mr. Smith.*] Will you read the memorandum you have prepared? Yes; it is as follows :—

MEMORANDUM NO. 1.—CONTRACT NO. 69.

*Speculative Tenders.*

It has been the practice, from the inception of the Sewerage Branch, about fifteen years ago, up to the beginning of 1894, to accept the tender which worked out to the lowest total sum, taking the probable quantities—given in the schedule—and the rates per unit stated by the tenderers. This system gave opportunity for much speculation on the part of the contractors. The idea which appears to have actuated them in preparing a tender was to place on such items as they thought were likely to be increased in quantity during the progress of the work, over the probable quantities in the schedule, a higher price than the true value of the work. On the other hand, if they thought there was likely to be a corresponding decrease they put a merely nominal price. By this means the total sum of a tender was kept down, and if the tenderer's speculation proved to be correct the contract, being a schedule rate one, would work out, when the final voucher came to be prepared, in the contractor's favour—the total sum being in excess of the total amount of the tender at schedule rates. Sometimes, however, as in all such ventures, the suppositions of the contractor have proved to be wrong, and he has suffered accordingly.

In the contract under consideration, it was known when the tenders were accepted that there would be three descriptions of ground through which the tunnels and shafts would pass, viz., soft ground requiring timber, shale, and hard rock. But what proportions of the shafts and tunnel would be in one or the other it was quite impossible to say. This could only be ascertained when the work was carried out. Full provision was made in the contract for varying the cross-sections of excavation and lining to suit the different kinds of ground passed through. The nature of the strata increased or decreased the dimensions of the excavation and the brick and concrete lining. When, therefore, the ground proved to be soft, and the excavation was increased in size and the lining in thickness, the quantities were necessarily increased; when hard, they were decreased.

When the survey for this sewer was made borings were taken along the line of sewer, through the soft ground, down to that of a harder nature. Below this it would have been too expensive to go. Any strata, therefore, below the bottom of the bore might prove to be hard or soft shale, or rock, and it would have been more or less assumption to say what proportion of these three materials would be met with in the excavation.

It has been the practice on this and other contracts of a similar kind to determine the cross-section of excavation when the tunnel was being driven, in order to suit the kind of lining to the circumstances. If the tunnel be in rock it is usual to excavate it 10 inches wider and 10 inches higher than the internal dimensions of the sewer, to admit of 5 inches in thickness of brick and concrete lining being put in. In shale hard enough to require blasting, but which when exposed to the air disintegrates, the tunnel is excavated for 10 inches in thickness of brick and concrete lining; whilst in softer material, requiring the use of timber, the excavation is taken out very much larger, and paid for in conformity with the specification to the outside of the timber. To give an idea of the different cross-sections for these three descriptions of sewer, I have prepared an estimate of the cost per chain at schedule rates, of excavation in rock, hard shale, and soft ground, respectively, for a 5 ft. 1 in. x 4 ft. 1 in. sewer.

|   | £   | s. | d. |
|---|-----|----|----|
| Ground which will admit of 5 in. lining being put in, using 57·5 cub. yds., at 27/6 | 77  | 9  | 7  |
| Do 10 in. do 73·9 cub. yds., at 27/6  | 101 | 12 | 3  |
| Ground requiring timber, 174·4 cub. yards, at 27/6 ... ..                           | 239 | 16 | 3  |

It

It is not difficult, therefore, to see why in this particular instance (Contract 69) the tunnel excavation should have been so materially increased, compared with the quantity given in the schedule. It was thought, when the Contract drawings were prepared, that the tunnel (in more or less hard ground) would have been in hard shale, whereas it proved to be ground requiring timber, and as a consequence the quantities given in the schedule for this kind of work proved to be much below what was expected. Indeed, it was quite impossible to say before the work was actually carried out what quantity of excavation of any particular description there would be. It is evident that if results did not turn out as the Department expected they did not turn out quite as Messrs Carter, Gummow, & Co expected either, or they would not have put such a low price on timber, by which, as it turned out, they lost heavily. They evidently speculated on a two-ring brickwork section that would stand without timbering. The schedule of quantities and prices attached to the contract provides for probable quantities only, and in the office estimate the prices were fixed to vary with the value of the work.

J. Davis.  
2 Sept., 1896.

From my own knowledge, it has been the habit for a number of years for tenderers to take advantage of the uncertainty referred to. No doubt in the case of Contract No. 69 the speculation assumed serious proportions. When Mr. Hickson saw the pitch it had reached, as indicated by that contract, he decided to adopt an entirely new system, which has since been introduced, where applicable, in the other branches of the Department of Public Works, and also by the Board of Water Supply and Sewerage, and, I understand, by his advice, by the Melbourne Board of Water Supply and Sewerage, where the same difficulty was being experienced. The tender for Contract No 69 was received on the 27th December, 1893, and the first tender under the new system was received in March, 1894; no time, therefore, was lost after the receipt of the tender for Contract No. 69 in adopting the new system. For some time before the change of system was decided upon it was unusual for a tender to be received which was not speculative to a greater or lesser degree

*New system of Tender.*

In inviting tenders for contracts now, no probable quantities are given in the schedule of prices, but a fair and reasonable rate is attached to each item of work, and the tenderers are asked to say whether they are prepared to carry out the work at the prices named, and if not, taking the rates as a whole, what percentage above or below the printed prices they are prepared to do the work for. The result of this has been to effectually prevent what was so glaring and objectionable a feature in the old system.

*Tenders for Contract No. 69.*

An examination of the eleven tenders submitted for this Contract (see printed papers, page 6) will show that Messrs. Carter, Gummow, & Co, were not alone in manipulating their prices. In the following table some of the conspicuous instances have been selected —

| Item | Office Estimate | Kerle and Kerle | Justin McSweeney | Holloway Bros | A Dean and Sons | Langtree and Owen | John Ahearne | Parry and Farley | T Stewart & Co |
|------|-----------------|-----------------|------------------|---------------|-----------------|-------------------|--------------|------------------|----------------|
| 6    | 50/-            | 25/-            |                  |               | ...             | ...               | 18/-         | 40/-             | 30/-           |
| 7    | 40/-            | 23/-            | 3 1/6            |               | 18/-            |                   | 15/-         | ....             | ...            |
| 8    | 30/-            | 23/-            |                  |               | 18/-            |                   | 16/-         | ....             | 50/-           |
| 9    | 60/-            |                 |                  |               | ..              | 42/-              |              | 38/-             | .....          |
| 10   | 55/-            | 35/-            | 35/-             | ..            | 25/-            | 41/-              | 18/-         | 33/-             | ....           |
| 11   | 45/-            |                 | 35/-             |               | 25/-            |                   | 19/-         |                  | ....           |
| 12   | 10/-            |                 |                  | 30/-          |                 |                   | ..           | 25/-             | 80/-           |
| 13   | 40/-            |                 |                  | 30/-          | 20/-            |                   |              | ..               | .....          |
| 14   | 30/-            |                 |                  |               | 20/-            |                   |              | ..               | ....           |
| 15   | 50/-            |                 |                  |               | ..              |                   |              | ..               | 80/-           |
| 16   | 10/-            |                 |                  | 30/-          |                 |                   |              | 25/-             | 80/-           |
| 17   | 40/-            |                 |                  |               | 20/-            |                   | 20/-         |                  | 100/-          |
| 18   | 35/-            | .....           |                  |               | 20/-            |                   | 18/-         | ....             | .....          |
| 19   | 30/-            | ....            |                  |               | 20/-            | .....             | 18/-         | ....             | .....          |
| 20   | 1/-             |                 |                  |               |                 |                   |              | ....             | .....          |
| 21   | 2/-             | -1              | -3               | 5/-           | 6/-             | 1/-               | ....         | 4/-              | -6             |
| 22   | 15/-            | 1/-             |                  | ...           | ...             |                   | .....        | ....             | -1             |

That the same sort of speculation occurred in other cases may be gathered, for instance, from Contracts Nos. 80 and 83. In No 80, Messrs. Parry & Farley's price for item 3, the equivalent of No. 9 above, was 110s. In Contract No 83, O'Neill & Co's. prices for items 6, 7, 8, the equivalent of 6, 7, 8 above, were 22s. 6d, 21s., and 21s., and for 9, 10, 11, and 12, the equivalent of 12, 13, 14, and 15, 4s. 6d., 20s, and 22s 6d. For timber left in tunnels (21 above), they had 6d, for cement facing, 4s., and for every further 1/4 mile lead to spoil, 1d.

With the exception of Mr. John Ahearn's tender, and perhaps Messrs. M'Kenzie's and Sons, Messrs Carter, Gummow, & Co's proved to be the best that could have been accepted. This will be seen to be the case if the attached schedule be examined, which I have prepared, showing the actual quantity of the work executed, computed at the rates attached to the several tenders.

The totals are as follows —

| No of Tender |                                  | Cost of work actually executed at different tenders received | Amount of Tender. |
|--------------|----------------------------------|--|-------------------|
|              |                                  | £ s d  | £ s d.            |
|              | At office prices .. ..           | 63,831 11 5  | 64,420 6 5        |
| 1            | „ Carter, Gummow, & Co.'s prices | 54,320 7 7   | 45,207 3 11       |
| 2            | „ John Ahearn's prices           | 47,459 6 6   | 47,061 3 0        |
| 3            | „ Kerle and Kerle's prices       | 56,864 4 8   | 52,735 10 9       |
| 4            | „ M'Kenzie and Sons              | 51,16 13 11  | 53,523 6 0        |
| 5            | „ J McSweeney's                  | 59,175 2 4   | 54,636 7 7        |
| 6            | „ Holloway Bros                  | 54,593 10 10   | 55,752 9 6        |
| 7            | „ J. F Carson's                  | 56,232 16 3  | 57,230 0 9        |
| 8            | „ A Dean and Sons                | 57,287 1 10  | 58,168 0 2        |
| 9            | „ Langtree and Owen's prices     | 66,371 9 9   | 59,676 14 0       |
| 10           | „ Parry and Farley's             | 66,695 6 6   | 63,095 11 11      |
| 11           | „ J. Stewart & Co.'s             | 75,404 17 6  | 68,173 10 11      |



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By a reference to the final voucher for this contract, it will be seen that items 1 to 10, being grouped into two rates, were condensed into two items, namely 1 to 4, at 9d., and 5 to 10, at 27s. 6d. Had the contract been carried out by any of the other tenderers, it would have been necessary to apportion the relative quantities to these ten items. It will be impossible to do this now, as the data, being unnecessary, were not recorded. The value of the work at the rates of the several tenders given in the above table is, therefore, not absolutely determinable. But, at all events, there are sufficient data to show that in two of these cases only (namely, Ahearn and Mackenzie) would the amount worked out have been under that of Carter, Gummow, & Co. In all other cases the amount payable would have been greatly in excess of the amount payable to Carter, Gummow, & Co.

It is scarcely necessary to point out that the reason why Messrs. Carter, Gummow, & Co.'s final voucher exceeds their tender, whilst the valuation of the work at the rates of either J. Ahearn's or Mackenzie and Son's tender falls below it, is due to speculation on the various items for excavation. The range of opinion upon this point, as exhibited in the tenders, shows the problematic nature of such estimates. If the average opinion be taken in order to arrive at a valuation of work—and this seems to be the only method to adopt under the circumstances—then the matter would stand thus:—The mean of the tenders, £55,933, and the mean valuation of the work as finished, computed at the various tender rates, £64,555. The office estimate was £64,420, and the value of the work, as executed, at the office rates, £63,831. Before the work was undertaken, therefore, and in the absence of the knowledge that has since been gained concerning the nature of the ground, a fair average value for the contract was fixed by the Department, at £64,420. Results have shown the average valuation of the finished work—made by eleven experts, under the most unprejudiced circumstances—is £64,555. In the light of this it may be fairly questioned whether Mr. Ahearn could have carried out the work at a sum of £16,961 below the office estimate, or below Carter, Gummow, & Co. Contractors do make mistakes sometimes, and suffer loss thereby, as admitted by Mr. J. Young (page 360, Q. 11779).

From the commencement of the sewerage works in Sydney and suburbs up to the change in the system of tendering, twenty contracts were let in which tunneling occurred. Ten of these have been carried out by Messrs. Carter, Gummow, & Co., or some member or members of that firm. There are not, therefore, many contracts other than those carried out by those contractors to which reference can be made. For many years very little speculation of the nature described was indulged in, but latterly the practice had greatly increased.

The speculative method of preparing tenders has not been confined to contracts comprising tunneling. Wherever the nature of the work has made the probable quantity uncertain, contractors have fixed their prices with a view to getting the minimum total sum for their tenders, and the maximum total sum for their final voucher. Notably amongst these might be instanced Contract No. 64 for the Main Western outfall aqueducts. At the time this contract was prepared it was impossible to say what kind of foundation would be found for the piers. It was thought that for about half the number of piers the foundations would be satisfactory without piling, and the probable quantity for piling was fixed accordingly. Considerably more piling, however, was necessary, and, as a consequence, the 40,000 cubic feet of timber in schedule was increased to double that quantity in the final voucher, and as the price was high (5s. per cubic foot) the contractor made double the profit he otherwise would have done. If the other classes of work on the same contract had been increased the result would have been different. For all that was known to the contrary when this contract was let the same thing might have happened as happened in the aqueduct contract across the Sewage Farm, in which, acting upon previous experience, a liberal quantity of piling was included in the schedule; but it turned out that a sufficiently good foundation was obtained for the piers without piling, and none therefore was paid for.

Preference is given to schedule rate rather than lump sum contracts for work of this description, especially for sewers in tunnel, because it would be unreasonable to expect a contractor to take the risk of stating a definite sum for which he would be prepared to carry out a practically unknown quantity of work.

The risk would be a heavy one and would naturally have to be paid for in proportion. Besides, there would be no check upon the final cost, and no way of arriving at an estimate of the value of the work. To prevent extravagance and secure economical administration in the Department it was necessary to take out preliminary quantities as accurately as circumstances might allow. It was deemed expedient to furnish the tenderers with these quantities in order that the tenders might be comparable with the office estimate. For many years the system worked very well, but at length its weakness was discovered and taken advantage of by the contractors.

The propriety of accepting a tender—based on high or low rates not representing the value of the work to be done—might be questioned; but it must be remembered that it has been invariably the practice to accept the lowest tender, without regard to the way in which the tenderer has fixed his rates, unless for some reason he has been disqualified. Indeed it is difficult to say what could be done otherwise than by altering the system of tendering.

The Department could not have rearranged the rates in a way that would have been satisfactory to any tenderer. Assuming, however, that this had been possible, it would have exposed the Department to really serious charges. If fresh tenders had been invited, it is highly probable that the same description of tender would have been received a second time. The only course, therefore, was to alter the system when it became manifest that it was subject to such grave abuses. This was done by Mr. Hickson, and tenderers were not permitted to arrange their own rates, as far as the Sewerage Branch is concerned, after March, 1894. Moreover, it must be borne in mind that, at the time the tender for Contract 69 was accepted, no one could say (except in the case of the pitching) whether the speculative rates fixed by Messrs. Carter, Gummow, & Co., especially in respect to the excavation in tunnels, would work out in the end for or against them.

#### *Subducts.*

This also applies in the case of subducts—because if the tunnel had proved to be wet, in so far as the pipes were concerned, the subducts provided for in the schedule would have been constructed. As it turned out, however, they were not required—not that it affects the question very much—as Messrs. Carter, Gummow, & Co.'s prices for subducts (although apparently low), when taken in conjunction with  
the



the excavation for the subducts, which is specified to be paid for at schedule rates, are probably set down at about a fair value, and are about the same as the other tenderers, as the following statement will show:—

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*Cost per lineal yard of Subducts, including Excavation.*

| Tender.                    | Item 24. | Item 25. | Item 26. | Item 27. |
|----------------------------|----------|----------|----------|----------|
|                            | £ s. d.  | £ s. d.  | £ s. d.  | £ s. d.  |
| Carter, Gummow, & Co. .... | 0 12 2   | 0 12 9   | 0 16 7   | 0 19 0   |
| John Ahearn.....           | 0 13 10  | 0 16 2   | 0 13 0   | 0 15 10  |
| Kerle and Kerle .....      | 0 15 6   | 0 16 6   | 0 11 2   | 0 13 9   |
| M'Kenzie and Sons.....     | 0 18 10  | 1 4 3    | 0 17 5   | 1 4 2    |
| J. M'Sweeney .....         | 1 1 6    | 1 3 3    | 0 18 0   | 1 1 9    |
| Holloway Bros. ....        | 0 16 0   | 0 17 6   | 0 19 6   | 1 3 9    |
| J. F. Carson.....          | 0 18 6   | 0 19 0   | 0 16 0   | 0 19 4   |
| A. Dean and Sons.....      | 0 18 9   | 1 4 2    | 1 7 7    | 1 11 0   |
| Langtree and Owen.....     | 1 2 6    | 1 4 6    | 0 11 9   | 0 13 9   |
| Parry and Farley .....     | 1 0 7    | 1 1 10   | 1 0 0    | 1 3 5    |
| J. Stewart & Co.....       | 1 9 4    | 1 11 7   | 1 3 0    | 1 6 0    |

If the tunnel is found to be so wet that the concrete, before it has time to set, would be damaged by the quantity of water passing along the bottom of the tunnel, subducts are used, but not otherwise. A tunnel that is dry, it is obvious, does not require any such provision. As it is impossible to say whether a tunnel will be wet or dry, before the excavation is carried out, it has been the practice of the Department in all tunnel contracts to provide items in the schedule covering the construction of subducts. Whenever it is possible to dispense with them they are not constructed, because in time they prove a source of weakness to the foundations of the sewer. Being laid with open joints, in order to admit the water, it is found that the soil creeps into them, no matter what precautions may be taken to keep it out, thus forming cavities under the sewer. In a part of the Bondi sewer driven through the sand the sub-ducts brought away so much of the foundations that a length of 8 ft. 6 in. x 7 ft. 6 in. sewer showed signs of failing some time after it was finished, and had to be strengthened. In this case every precaution was taken that experience could suggest in the way of boxing, &c., to keep out the sand.

*Items included in Schedule—but not often used.*

The uncertainty of the nature of the ground and other circumstances connected with the construction of sewerage work makes it expedient to provide in the schedule items for work which may possibly be necessary, in order to obtain prices for them. By this means a check is kept upon exorbitant extras; for contractors, if not tied down to prices at the time of tendering, would afterwards quote very much higher rates for extras.

*Final voucher.*

The foregoing fully explains why the quantities returned in the final voucher are so different from those in the schedule attached to the contract. It may, however, be necessary to give some explanation on several items.

The quantity returned for Item 1 is practically the same as that given in the schedule attached to the contract, although the price (9d. per cubic yard) is low, and represents probably 30 per cent. of the true value of the work. The parts of the tunnel paid for under Items 8 and 11 exceed the quantities provided for in the schedule, because the nature of the ground passed through required a larger cross section of excavation than was anticipated. The quantity of tunnelling estimated to be done was 9,580 yards, whereas the actual quantity was 14,373 cubic yards, or a difference of 4,793 cubic yards, which, at schedule rates (£1 7s. 6d. per cubic yard), amounts to £6,590. The tunnel excavation, therefore, is responsible for the major portion of the excess of the final voucher over the tender. I would point out also that this increased amount for excavation is not in any way due to payment at an exorbitant rate. £1 7s. 6d. per cubic yard on these items is not a high one, as may be seen by comparing the tenders, especially if due allowance be made for the low rate on the first four items.

The only item in shaft excavation which calls for remark is No. 16, where the quantity in the schedule is exceeded. This is due to the soft nature of the ground, which necessitated timbering, and consequently a larger sectional area of excavation than was anticipated.

It should be noted that the schedule rate for timber ordered to be left in open trenches and tunnels (Item No. 21) is put down at 1d. per cubic foot. As before mentioned this rate is absurdly low. The usual price for work of this description is 2s. per cubic foot, and, as the quantity given in the schedule has been exceeded, the contractors have been paid £950 less than they would have been paid had they tendered at the value of the work.

With regard to Item No. 36 for bluestone pitchers round manholes, the probable quantity given in the schedule is 12 square yards, whereas if all the manhole covers were to be pitched the quantity would work out to about 35 square yards. Messrs. Carter, Gummow, & Co. before putting in their tender evidently discovered this, and came to the conclusion that if all the manhole covers were to be pitched the quantity given in the schedule would be greatly increased. They accordingly put an extremely high price down for the work. The specification provided that these pitchers were to be put round all manhole covers, but after the tender was accepted, and the work came to be carried out, attention was called to the small quantity provided for in the schedule; and it was also pointed out that, while in the specification this provision was made, pitchers were not shown on the contract drawings to be put round all the covers. The Engineer-in-Chief (Mr. Hickson) took advantage of this, notwithstanding the strong protest on the part of the contractors, and decided that only those pitchers were to be carried out that were shown on drawing, and instructions were given to the officer-in-charge accordingly [see Parliamentary Papers, page 125, No. 17]. Before, however, the contract was completed, Mr. Darley was appointed Engineer-in-Chief for Metropolitan Sewerage Construction, and the works were taken over by him, and another Resident Engineer put in charge, who appears not to have known of Mr. Hickson's decision; and the contractors pitched, with two exceptions, the whole of the manhole covers, and were paid for them in the final voucher

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Since the inauguration of the Sewerage Branch in November, 1879, up to the present date, 117 contracts have been let and completed, with the following result:—Amount of tenders worked out at schedule rates £1,440,225. Total amount of final vouchers, £1,433,186. Showing that the amount of the tenders worked out at schedule rates has exceeded the amounts of final vouchers by the sum of £7,039, or a saving of that amount in about one and a half million pounds worth of work. It will therefore be seen that, although speculative tendering has been in vogue for sixteen years, while in some cases the quantities at schedule rates worked out to more than the amount of the tender, the opposite occurred quite as frequently.

I should like to add, with regard to the bluestone pitchers, that it is usual, when a contract is let, to forward to the supervising officer a schedule of prices, which is really a copy of the contractor's tender. At the time Contract 69 was let that was done. I received a schedule, and in that schedule a clerical error was made. As it happened it proved to be rather a serious one. The clerk, instead of putting down £50 opposite the item of bluestone pitchers, had put down 50s. per square yard. It was not until the beginning of May that I discovered that there had been a mistake. So that from December until May I was carrying out the contract upon the assumption that the bluestone pitchers were to cost the Department 50s. a square yard and not as it turned out £50 per square yard. (*Vide Appendix No. 81.*)

15481. This speculative tendering by contractors is no new thing at all? No; it is in vogue to a greater or less degree, not only in all the public departments in New South Wales, but from what I can understand, and what I have been able to gather from my own experience, much the same state of things exists all the world over.

15482. The only way to put a stop to it was by adopting a new system, and that has been done? That is the case.

15483. Contract 69 was dealt with in the ordinary way;—although it afforded a glaring instance of the operation of the old method, the contract was dealt with in the ordinary manner? Yes; the practice of the Department when tenders were received was to make out a list of the whole of them. This was forwarded to Mr. Bagge. He prepared a schedule of the tenders, and in sending on his recommendation to Mr. Hickson, if he found anything he did not approve of in the tenders, it was his duty to call attention to it. He does not appear to have taken that step in this case; and, unless Mr. Hickson's attention had been called to the matter in that way, I do not see how he could have known of it.

15484. At all events, no exception was made in this case in the way of dealing with the tender? No; except in regard to two minor matters which Mr. Bagge pointed out, and which Mr. Hickson thought were of no consequence. They appear in the Parliamentary papers.

15485. So far as you have been able to find out, there is nothing to show that any undue concessions were made to the contractors in respect of this contract? There most certainly were no undue concessions.

15486. I should like you to explain another matter: Mr. Parkes told us on the last sitting day that he had not the slightest doubt that these contractors must have had private information from the office before they sent in such an absurd schedule;—I should like to know what you have to say as to that? The only information I can think of which would have been of any use to the contractors was in the nature of getting a hint that a mistake had been made in the probable quantities in respect of the bluestone pitchers. Their attention might have been called to that. I do not say that it was, but it is possible that that may have been done. As to anything beyond that, I do not see how any one of the officers could have helped them. These contractors are men of experience, and in going through the probable quantities it may have struck them at once that they were wrong. For instance, there are over thirty man-holes; and as it takes more than a yard of bluestone pitching for each man-hole, it was evident that the 12 yards were wrong.

15487. The fact was, that the plan showed thirty-two man-holes, and anyone who saw the plan would come to the conclusion at once, on comparing it with the schedule, that an error had been made? Yes; they might do that without any assistance whatever from the officers of the Department.

15488. It is a mistake which anyone going carefully into the matter would have seen? Yes.

15489. The same information upon this point was open to all the other contractors who tendered? Yes.

15490. Is there anything else of any possible use to tenderers which could have been suggested by anyone inside the office—can you imagine anything else? No. Of course in the carrying out of the work it might be said that they had someone in charge of it who worked with them. I know that during the proceedings of this Commission it has been left to be inferred that that is the case. I swear absolutely that in regard to Contract 69, taking any of the items, the same practice was observed in regard to the excavation, for instance—in regard to the subducts, in regard to everything, that was observed upon contracts let to other contractors.

15491. Let me go one step further: Suppose, for a moment, that this firm of contractors had a paid agent in the office, what would be the value of his information—what facts could he have given to the contractors which would have assisted them? He could have given them no information, except by way of calling their attention to a clerical error of the description I have named.

15492. In fact, the whole of the information at the disposal of the Department, or any of its officers, was put before the contractors in the probable quantities? Yes; it was the office idea of the probable quantities of the work. The difference comes in this way: The contractors would take out the quantities for themselves, and they would say, in regard to a particular item, "We do not agree with the office. From our experience and local knowledge, we do not agree with the office as to this probable quantity." They would, from their experience and local knowledge, prepare a schedule of probable quantities, independent of the office quantities, and base their prices upon that schedule, instead of on the probable quantities given by the office.

15493. *His Honor.*] Did it turn out in the sinking of the shafts, after all, that beds of clay or soft shale were found underneath bands of fairly hard sandstone? No. What I say is this: that borings were taken along the line of sewer; and in the majority of cases, where you came on to hard sandstone with your bore, you might be sure that you would get no soft ground below it; but in regard to shale, you may come on to fairly hard shale, and we would then say "That is as far as we need go." The nature of the shale below may differ. It is most difficult to say from the bores what the shale may turn out to be. It may prove so hard as not to require timbering, or it may prove to be so jointy and soft, when the air operates upon it, that it will be absolutely unsafe for workmen to sink shafts in it unless they are timbered.

That

That accounts for the difference between the sectional area of excavation in one case and another. It affects the quantities in that way. J. Davis.

15494. Do you say that boring is too expensive for the Department to feel justified in putting the bores right down to the level of the sewer through apparently hard shale? Yes. If the shale proves to be very hard we do not go on. It is too costly; but if we can do the boring in the shale at a moderate cost we go on to below the invert of the sewer. The drawings which are already in evidence will show that we do not stop on the top of the shale, but that we go through it to what we consider very hard shale, which it might be too expensive to bore through. 2 Sept., 1896.

15495. In this case you did stop on the top of the hard shale? Not in every case.

15496. Otherwise there would not have been the same opportunity for the contractors to speculate successfully on the softer shale underneath? I would not like to speak positively as to that without examining the longitudinal sections. I am speaking now as to the general practice of the office. (*Vide Appendix D.*)

15497. *Mr. Smith.*] To come to another charge by Mr. Parkes affecting the Department—I mean Charge 2;—he there charges the Department with allowing a contract to be taken up by Carter, Gummow, & Co. with an insufficient bond, and with ultimately breaking that bond by remitting the retention money;—you have examined that matter, and you have a short statement of facts with regard to it? Yes; I have made a statement with regard to the sureties, and also the retention money, and the returning of the fixed deposit upon Contracts 79 and 79A. That is a kindred matter, and I have dealt with the whole of these subjects, therefore, in memorandum No. 2.

15498. I understand that your memorandum No. 2, then, will deal with the fifth charge as to Contract 79, which is of a similar nature? Yes; Contract 79A is also involved. First of all I deal with the sureties. The memorandum is as follows:—

#### MEMORANDUM No. 2.—SURETIES.

WITH regard to sureties having been accepted in lieu of the usual fixed deposit on Contract No. 69, the concession was granted owing to the tender having been accepted subject to the contractors being paid in Funded Stock, under the Funded Stock Act of 1892, in lieu of cash, the contractors having verbally represented to the Minister that it would be a hardship to ask them to provide the cash security required by the General Conditions, when they were not actually being paid in cash for the work. Several other contracts were accepted about this time on the like condition, and in each case personal security was accepted in lieu of the usual cash deposit. (See the list of contracts handed in to the Commission by Mr. Norrie when giving evidence on 3rd July, 1896, Q. 7224, and Appendix No. 66.)

In all these cases, inclusive of Carter, Gummow, & Co., a personal security was accepted in the penal sum of 10 per cent. on the amount of the contract, as against the 5 per cent. cash deposit provided for in the General Conditions.

At the time Carter & Co.'s sureties were accepted it was not known that Parbury, Henty, & Co. were to supply the cement—not that it makes any difference. Mr. Scrutton's firm did not supply the iron. It was obtained from Mort's Dock Engineering Co.

#### *Retention Money.*

It is not admitted that the Minister cancelled the bond in connection with Contract No. 69 by returning a portion of the retention money, nor that the contract was in any way broken. Upon the return of the £1,000 referred to in Mr. Parkes' speech of 12th May, 1895 (page 28 of *Hansard*, and page 127 of printed papers), the Department still held £1,300, in addition to the personal securities already referred to, for the due completion of the contract. It was therefore considered that the Department was amply secured, and perfectly safe in returning the £1,000 to the contractors.

It has been the practice of the Department to return portions of the retention money held on contracts where it was found that the Department was otherwise amply protected, it being the desire to assist contractors as far as could be legitimately done, and not to in any way harass or inconvenience them, so that the return of the sum in question to Messrs. Carter, Gummow, & Co. was only uniform with the general practice. The General Conditions provided that the clause relating to the cash security and retention money, in common with any other condition of the contract, may be varied by the Minister (*see clause 27*).

The General Conditions now in use provide that should the Minister, at his discretion, make any payments out of the retention or deposit money to the contractors, the action shall not in any way prejudice the Minister's rights under the contract, or be taken as an admission of any claims made by the contractor, so that, although formerly the Minister impliedly reserved to himself the right, under clause 27 of the General Conditions, to make these payments, he has since expressly provided for his so doing. I may mention, for instance, that on the 13th March, 1893, the Minister returned to Mr. O. McMaster, the contractor for the Milson's Point Railway extension, the sum of £1,500 retention money; and in October of the same year, to Mr. Justin McSweeney, the contractor for the tramway from King-street to Ocean-street, the sum of £2,000. Messrs. Proudfoot & Co., the contractors for the railway from Marrickville to Burwood-road, also received a portion of their retention money.

With respect to the retention moneys on Contract No. 79, regarding which Mr. Christie gave evidence on 22nd July, 1896, the explanation is that 5 per cent. only was kept back, so as to preserve uniformity of practice, the new General Conditions, providing that the maximum amount of retention money should be an amount equal to 5 per cent. on the amount of the tender, being at that time incorporated in the greater number of the contracts then being let. The contractors having, on the 28th December, 1893, represented that they would experience some difficulty in making satisfactory arrangements for the disposal of the Funded Stock, with which it was proposed to pay them for Contract No. 69, which was accepted on the 11th of that month, and having asked for assistance in the matter of making financial arrangements by the return of the retention money on Contract No. 79, amounting to £2,000, the Minister, in consideration of the contractors, having shown their willingness to meet the Department (with regard to the acceptance of payment for Contract 69 in Funded Stock), agreed to grant their request, and the £2,000 was accordingly returned to them. The work then remaining to be done on Contract No. 79 did not exceed £4,000, against which the Department held the contractor's deposit of £2,000 for its completion.

*Fixed*

J. Davis.

*Fixed Deposit—Contract 79 and 79A.*

2 Sept., 1896.

In June, 1894, when the whole of the works comprised in Contract 79 had been practically finished, and there only remained the extension (Contract 79A) to be carried out, the question of the fixed deposit was brought forward for consideration. It was not thought necessary to retain £2,000, and the contractors were allowed to substitute another fixed deposit, for the sum of £650, for the works comprised in the extension. In addition to this, the sum of £531 10s. 6d. was held until the expiry of the maintenance period set out in the main contract.

Fixed deposits were frequently returned to contractors prior to the expiration of the maintenance period, so often in fact that the clerk in charge of bonds and contracts had a form struck off to meet such cases; but every case was considered on its own merits. I attach a list hereto showing some instances in which this practice has been followed.

## FIXED Deposits, &amp;c., returned before Completion of Contracts.

| Date.            | Work.   | Contractor.               | Amount.    |
|------------------|---|---------------------------|------------|
| 28 Feb., 1893... | Contract 68, Sydney Sewerage, Beattie-street Sewer .....  | M. Waddington .....       | £ 350 0 0  |
| 16 Dec., 1892... | Pipe-laying, Duplicate Main, Pott's Hill to Sydney .....  | Gilliver and Curtus ..... | 1,000 0 0  |
| 20 Feb., 1893... | Railway, Culcairn to Corowa.....                          | Horne and Shand .....     | 5,000 0 0  |
| 11 Aug., 1893... | Railway, Lismore to the Tweed, Contract No. 2 .....       | Kerle and Kerle .....     | 7,000 0 0  |
| 5 Sept., 1893... | Railway, Kiama to Nowra.....                              | E. Pritchard .....        | 10,000 0 0 |
| 25 Dec., 1893... | Railway, Molong to Parkes and Forbes, Section No. 1 ..... | Baxter and Saddler .....  | 6,000 0 0  |
| 8 Jan., 1894...  | Railway, Cootamundra to Temora .....                      | " .....                   | 4,500 0 0  |
| 17 Dec., 1895... | Railway, Molong to Parkes and Forbes, Section No. 2.....  | " .....                   | 6,000 0 0  |
| 20 ,, 1895...    | Erection of Post and Telegraph Office, Homebush .....     | W. and J. Brown.....      | 65 0 0     |
| 6 Feb., 1896...  | Erection of Agricultural College, Richmond .....          | Grant and Mathieson ..... | 375 0 0    |
| 18 ,, 1896...    | Contract No. 102, Sydney .....                            | John R. Locke .....       | 197 12 0   |
| 28 ,, 1896...    | Lock-up, Marrickville .....                               | W. H. Smith .....         | 120 0 0    |
| 30 June, 1896... | Post and Telegraph Office, Parramatta North .....         | Thomas Cranney .....      | 40 0 0     |
| 2 Mar., 1896...  | Aluminum Roof, Works Office .....                         | E. D. Bush .....          | 50 0 0     |
|                  | Green-house, Government House .....                       | Thomas Simpson .....      | 15 0 0     |

I give this list so that it may be shown that Messrs. Carter, Gummow, & Co. were not treated differently from other contractors carrying out larger or smaller works, as the case might be, and that no concessions were made to them which were not made to other contractors in like circumstances. (*Vide Appendix No. 62.*)

15499. You have dealt with the advances made to the contractors on the three contracts you have just mentioned, 69, 79, and 79A? Yes; I have dealt briefly with them.

15500. Those are the matters referred to in Charge 4, affecting Contract 69, in Charge 10, affecting Contract 79, and in Charge 2, affecting Contract 79A? Yes; I have prepared the following memorandum:—

MEMO. No. 3.—RE ADVANCE ON CEMENT MADE TO MESSRS. CARTER & CO. ON CONTRACTS NOS. 69, 79, AND 79A. (*Vide Appendix No. 67.*)

WITH regard to the advances on material in connection with Contract No. 69, the Minister approved of the advance of sums to the extent of £1,000; but, as shown in Mr. Christie's evidence, page 382, this authority was only availed of to the extent of £450.

The minute written by me, and given on page 366 in the printed papers, does not contain the Departmental rule, but relates simply to Contract No. 79A. As a matter of fact, there is no rule of the kind in existence. The practice on Contract 79 was to advance at the rate of 16s. per cask, that being the schedule rate for one cask of Portland cement attached to the contract; and on Contract 79A at the rate of 75 per cent. of the market value of the cement—that is to say, 75 per cent. of 12s. 6d. per cask, which amounted to 9s. 4½d.

With regard to the high rate of advances made on Contract 79, the very expensive plant which the contractors had on the ground for the purposes of the work was also taken into account. This plant was probably worth £3,000; and, in addition, they had large stocks of bricks upon which no advance had been made. It must, however, be borne in mind, when reading Mr. Christie's figures, that the advance made in any particular month would either be reduced or increased in the next month, according to the quantity of material on the ground, and that the second advance would not be an addition to the first one; but the first one in the recapitulation attached to each voucher would not appear except in the money paid to the contractors, so that at no time was there a greater sum than £2,160 advanced on material. Mr. Christie's table should, therefore, be read as follows:—

- On the 13th progress return the sum of £720 was advanced.
- On the 14th progress return the advance was renewed.
- On the 15th progress return the advance was reduced to £696.
- On the 16th progress return the advance was increased to £1,360.
- On the 17th progress return the advance was increased to £2,160.
- On the 18th progress return the last advance was renewed.
- On the 19th progress return the advance was reduced to £1,760.
- On the 20th progress return the advance was reduced to £1,280.

15501. The security taken from the contractors included not only the cement, but also the plant and material? Yes; the moment the material and plant come on to the site of the works they become the property of Her Majesty, so that if at any time the contractors throw up the work they fall into the hands of the Department.

15502.

15502. Besides that, I think there was a special agreement with regard to material? Yes; that was more to cover the question of the cement being perhaps not technically on the site of the works. In some cases, as in the case of 69 and also 79, some of the cement was stored on private property, and although it was to all intents and purposes on the site of the works, still it may have been questioned, and for that reason this special agreement was taken from the contractors. J. Davis.  
2 Sept., 1896.

15503. So as to get security over the material wherever it might be? Yes.

15504. It was the common practice of the Department to make these advances to contractors in order to assist them? It is quite the usual thing.

15505. Mr. Christie, in his evidence upon page 380, refers to the application of Holloway Brothers, of Goulburn, who wrote to the effect that they were desirous of tendering for Contract 69, Sydney Sewerage, but that the cash deposit stood in their way. They asked whether the Department could not accept a less cash deposit in their case—say, £1,000 and sureties for the balance. The answer given was that the Minister could not consent to any reduction in the cash security required. That application was made before the tenders came in? Yes; on the 4th November, 1893, whereas tenders were received in December.

15506. It was dealt with before the tenders were received? Yes; it was referred to the Board of Reference and dealt with by the Minister before tenders were received.

15507. And it was after tenders had been received, and after Carter, Gummow, & Co.'s tender had been accepted, that the arrangement was made with them with regard to funded stock? Yes; the Minister, in accepting the tender, stipulated that the contractors were to be paid not in cash but in funded stock. That was made a condition of the acceptance. At the time Holloway Brothers wrote no one had any idea of the contractors' being paid in funded stock, and it was because the contractors were paid in funded stock that the personal security was accepted in lieu of cash deposit.

15508. It was because the contractors had met the Minister by taking funded stock that the arrangement was made for personal security in lieu of a cash deposit? Yes.

15509. Now that we are upon this subject, I might perhaps deal shortly with the several charges relating to the withholding of papers from Parliament. Those charges affect Contracts 69, 72, 79, and 77. Take Contract 69. Mr. Christie has pointed out that the two letters to which I have just referred—the letter from Holloway Brothers, of Goulburn, and the answer—were not printed in the Parliamentary return;—how do you account for that? It is very probable that at the time I selected the papers for the Parliamentary return I left out the two papers to which you refer, as being of no importance—that is to say, of no importance in regard to Mr. Parkes' inquiry.

15510. The application having been made before the tenders were sent in? Yes. I might explain that when the papers were asked for, Mr. Barling asked me to see that all the papers relating to the matter in question were sent on to the House. The record clerk got the papers together in a private room, and I then went through the whole of them and selected those which I thought would be pertinent to the matter, and which Mr. Parkes would be likely to require. It is quite possible that in regard to Holloway Brothers' letter I put it aside as not likely to be required.

15511. It related to a matter which occurred before the tenders came in? Yes; it did not seem to me to affect the matter of Carter, Gummow, & Co.'s contracts at all.

15512. Will you take the next four items referred to in Mr. Christie's memorandum upon page 380;—what do you say as to the omission of those papers from the Parliamentary return? They were not in the bundle, and I did not know of their existence. It is evident from the date of the last letter that they would be away at the time with the Water and Sewerage Board. They were certainly not in the bundle. I can say absolutely that they were not intentionally left out; they were left out quite by accident.

15513. With regard to Contract 72, those papers were not asked for, I believe, in the order of the House? No; the matter was considered by Mr. Barling, and it was decided that with certain exceptions those papers should be left out. I believe there was a difficulty in getting the papers; they were mixed up with M'Namara's claim. Mr. Barling was first of all under the impression that the papers were asked for, but I assured him that they were not. I remember reading to him the terms of the order, and telling him where the contract was. I pointed out to him that it could not by any means be covered by the terms of the order. Mr. Barling said, however, that in view of the fact that Contract 72 was mixed up with No. 79, and that Contract 72 was cited in the agreement made between the contractors and the Department in respect of No. 79, it would be well, at any rate, to give the contract itself and the final voucher. They were put in accordingly. That is the reason why those particular papers were put in. (*Vide Appendix No. 68.*)

15514. Then with regard to Contract 77, the charge is the plans were withheld;—what have you to say as to that? To begin with, plans were not asked for. I do not myself understand the term "papers" to mean "plans." The motion winds up with these words, "including the specification, schedule, &c., for original contracts." There is no mention of the plans. That matter, also, was discussed at the time, but we considered that as plans were not called for, it would be very wrong to send them along to be printed at such a serious cost.

15515. I suppose the expense would have been very great indeed? Yes; of course the expense of printing weighed with us at the time the papers were sent forward.

15516. At all events, in preparing the papers for Parliament every care was taken, and there was absolutely no intention to leave out anything at all which was material? Yes, every care was taken. A clerk was engaged exclusively upon the work of getting the papers together for fully a fortnight. Then, under my direction, the papers were selected. I used my discretion as to what papers should be sent on and what papers should not be sent on. I thought I included every paper that would be likely to be required.

15517. With regard to Contract 72—and charges 1 and 2 affecting that contract,—in the first place, the Department are charged with paying away large sums of money to the contractors which the Departmental officers were not obliged to do under the contract conditions, and with settling a claim without a proper test as to the liability of the Crown for a sum of £4,050 9s. 6d., by granting the contractors a preference over other contractors, and by not re-tendering for the contract, when in the interests of the Crown it was the clear duty of the Departmental officers to do so. In the second place, the Department are charged with granting the contractors concessions in payment upon the contract by which the Crown was the loser.

J. Davis. loser;—you have made a memorandum dealing with those matters? Yes; I have a statement of fact as to those matters which I will read. It is as follows:—

2 Sept., 1896.

MEMO. No. 4.—CONTRACT No. 72.

*Stoppage of Work.*

WHEN the channel was finished, or nearly finished, up to the foot of McDonald-street, all the money available for the work had been expended. The Engineer-in-Chief then wrote, on the 13th October, 1891, giving the contractors notice that it was intended not to construct the channel beyond that point. He referred to clause 3 of the specification, which is virtually a repetition of the last paragraph of section 4 of the general conditions, hoping that it would put the idea of a claim out of the contractors' heads. Mr. B. C. Simpson, however, forwarded a claim on behalf of the contractors, stating that, in his opinion, the general clauses referred to did not contemplate such a large portion of the contract not being carried out. Money was, however, voted for the continuation of the work, on the 1st April, 1892, and the contractors, Messrs. Carter & Co., were then instructed to resume and finish it. The contractors, therefore, would most clearly have been entitled to compensation for stoppage of work from October to April, a period of six months, in accordance with the fifth paragraph of the tenth section of the general conditions.

When Mr. Lyne wrote his minute of 23/2/92, in which he states, after having seen Mr. Hickson, that Carter & Co. would, in all probability, be able to make good a claim for something like £2,000, as compensation on Contract 72, the compensation referred to was for this stoppage of work.

A similar case to this occurred on the sewerage works at Bondi (contractors, A. J. Smyth & Co.) in 1884. The works were stopped on account of the representatives of the Cooper family having obtained an injunction, and, although they were only suspended for a period of about two months, the contractors were paid, on the advice of the Crown Solicitor, the sum of £3,000 as compensation. In the present instance, it must be borne in mind that no compensation was paid, and that it was merely thought that the contractors might be able to sustain a claim of upwards of £2,000 for the suspension of the work from October, 1891, to April, 1892. If it had come to a question of actually paying a sum for compensation, the papers would most unquestionably have been sent to the Crown Solicitor.

*Difference between Final Voucher and amount of Tender.*

The difference between the amount of the tender accepted and the amount of the final voucher (£20,650 and £25,264 19s. 4d. respectively) arose through additional excavation having to be carried out at the outlet of the channel along the site of the proposed Shea's Creek canal. When the contract was let, it was thought that there existed a suitable outlet for the channel into the swampy ground below Mitchell Road, but it was afterwards found that it would be prudent to continue the channel from Mitchell Road to Shea's Creek, and cut an earth channel along the site of the proposed canal, in order to give a proper outlet for the storm-waters draining to that point. Provision had been made in the specification (clause 3) giving the Engineer power to omit 13 or 27 chains of the lower portion of the channel, but for the above reasons this specific clause was not made use of.

*Wrought-iron Girders used in construction of Channel, Contract 72.*

In Contract No. 72 wrought-iron girders were included for covering a junction, and for the construction of a flume where the Shea's Creek crosses the concrete channel. Mr. Hill, agent for Mr. Cooper, the owner of the land through which the sewer passes, after the tender was accepted, would not allow the work to proceed unless a certain length of the channel were covered through a sandhill, which lay between the Macdonaldtown Creek and Shea's Creek; but he stated that if this were done he would allow the work to go on without compensation. It was contemplated that, in the ordinary course, compensation would have been paid for the land through which the channel passed, and this being the case, it was considered that, as the additional work asked for by Mr. Hill, which included these girders, would only involve an expenditure of about £600, and save not only a stoppage of the work but also a large sum for compensation and severance, the best plan would be to comply with his request. The channel was accordingly covered with girder iron and jack arches, and paid for at schedule rates.

15518. With regard to the charge of defective work upon Contract 69, can you tell us anything about the evidence which was given by Benson and Darcus? I think Mr. Griffiths could speak more positively as to that, I think it would be better to leave that matter to him.

15519. Those were the only two witnesses as to that matter, excepting that Mr. Parkes made a general reference to what he called "the talk of the town"; for instance, in reply to question 15,302, he said, "I can tell you that amongst workmen in the city of Sydney, it is a common thing for the men to talk about the way cement structures are carried on; every man will tell you—I do not care where he is about the city of Sydney—that he can get a shilling a day extra if he can save a cask of cement every day";—I suppose it is a fact, well known to the Department, that contractors generally want a good deal of watching in the matter of cement? If they did not there would be nothing for many of us to do.

15520. It is well known in the Department that it is a thing you have to watch pretty closely, no matter who the contractors are? Certainly.

15521. What arrangements are made to ensure the right quantity of cement being put into the work in these sewerage structures? The specific arrangements which are made are these: Where brickwork and concrete are carried out, there is first of all a chief inspector, whose business it is to overlook the whole of the work. In addition to that, where concrete is being done, an overseer is put on to watch every gauge made. Every gauge of concrete that is measured is under the immediate supervision of an overseer, whose business it is to see that the gauge-box is properly filled, and that the proper quantity of cement is put in. He is there for that and no other reason. He has no discretion. He has simply to see that the specification is complied with in that respect, and at the end of the day he gives to the principal inspector the quantity of cement which has been used in the concrete or brickwork, as the case may be. The principal inspector then returns the quantity to the head office. In addition to that, what might be termed the general arrangement is this: There is a resident engineer, whose business it is to be about the contracts generally during the whole of the day. He is supposed to see that the inspectors do their duty; and, being a man of experience, one glance at the concrete, whether it is in process of being mixed or in position, would tell him roughly—not perhaps accurately, but still roughly—whether the proper quantity



quantity of cement was being used in the work. Over and above that there is what the Department call the supervising officer. His business is to go round the whole of the contracts. He being also a man of experience is able to tell whether the right thing is being done; so that it seems to me that to say that the proper quantity of cement has not been put into the work amounts to saying that the inspectors have been got the better of by the contractors. There is no other possible explanation. You are limited to that. As far as the Department itself is concerned it provides ample supervision.

J. Davis.  
2 Sept., 1896.

15522. The instructions to the inspectors are very strict, and they are allowed no discretion? No discretion whatever. If it is found that things are wrong—and evidence of that has been brought forward during the sittings of the Commission—the inspectors are dealt with, and dealt with very severely too.

15523. If any such matter is brought before the engineer-in-charge I suppose he reports it? He reports it, and then action is taken. In addition to all that, we have an absolute check in the quantity of cement brought on to the ground; so that on the termination of a job we know absolutely whether the cement brought on to the ground tallies with the quantity of cement which has been returned by the inspectors, and what would be the proper quantity of cement to be used in the work; so that we have a check on every hand.

15524. I might ask you this question in a general way: it has been suggested that concessions were made to Carter, Gummow, & Co. with regard to an alleged shortage of cement; I should like to ask you whether, in regard to any of the contracts which have been referred to, the Department, through its officers, had any knowledge whatever of any shortage of cement? None whatever.

15525. If they had had, the man who passed the work would have been called to account at once? Certainly.

15526. As to the alleged defective work upon Contract 60, I believe you have discovered a minute which was written by Mr. Bagge? Yes; it is a minute dated 22nd January, 1891, and it is with reference to charges of the witness Wright. It is as follows:—

Mr. T. Wright brings two distinct charges, viz., drunkenness and allowing the contractors to use condemned cement, against Mr. O'Hanlon and Inspector Inwood.

The first was fully inquired into on the 14th October, 1890, when Wright withdrew all charges against Mr. O'Hanlon, but repeated his charge of drunkenness against Inspector Inwood, who, as his conduct appeared to have been somewhat indiscreet, was disrated for some time. He has since, on account of his subsequent exemplary conduct, been reinstated.

With regard to the second charge, Wright, on the 14th instant, wrote to Mr. Davis, accusing Mr. O'Hanlon and Inspector Inwood of being the cause of his dismissal from the employ of Messrs. Carter & Co., contractors for Contract No. 60, North Shore, and of allowing these contractors to use condemned cement.

Mr. Davis, on inquiry, finds that the contractors dismissed Wright for using very abusive language; and, with regard to the cement, the whole of the cement used on the contract up to the 11th October, 1890, amounted to 212½ casks, consisting of fifteen casks of approved cement obtained from another contract in order to start the work, and about 200 casks tested and approved on the 31st July last. The charge of allowing condemned cement to be used cannot, therefore, be substantiated, unless the cement in the contractor's store-room had been changed at night for slightly-damaged cement of the same brand. This, however, would be very dangerous and unprofitable for any contractor to attempt; and I do not believe that Messrs. Carter & Co. would lend themselves to such a proceeding.

The impression made by T. Wright at the inquiry on the 14th October last was that of being a very abusive and vindictive person, and I believe he has now preferred these charges for the purpose of annoying the contractors (his late employers) and the Department.

C. H. OHLFSEN BAGGE,  
22/1/91.

15527. With regard to charge No. 7 in connection with Contract 79—I mean the charge of improperly paying an amount of £350 6s. 8d. to the contractors for removing material, which work they never performed—I believe it is dealt with by papers 95, 96, 97, and 98, which appear upon pages 329 and 330 of the Parliamentary Return? Yes. The papers are as follows:—

The Council Clerk, North Sydney, to Supervising-Engineer Davis.

Sir,

Borough of North Sydney, Town Hall, 31 July, 1894.

Referring to the conversation between yourself and the Mayor yesterday with respect to the removal of ballast from the sewer shafts at North Sydney, I am directed to request that instructions may be given to the contractor to remove this surplus ballast to such places in the borough as may be pointed out by the Council. This ballast is extremely valuable to the borough, and for some time past the Council has been removing and using it for municipal purposes. This has been done by arrangement with the contractor, the Council being unaware that, in terms of his contract, the contractor had to remove it where directed; and the rates paid by the Council for such removal have been 7½d., 10d., and 1s. 3d. per load.

The Mayor understood, during his conversation with you yesterday, that your Department had also paid the contractors for removing it, and if such be the case it would appear reasonable that the Council should be refunded the amount of £123 9s. 4d. which it has also paid for the work.

This, however, is not put forward as a claim; but the Mayor will be glad if you can inquire into the matter, and if, upon consideration, you think it a fair suggestion, that you will allow the amount to be refunded to the Council.

Having now ascertained the exact position of the contractor in this matter, the Mayor has directed that no more material be removed at the cost of the Council, and he will feel obliged if instructions can be given to the contractor to remove all such surplus material to places to be pointed out by the Council, and which will be within reasonable distance of the works.

I have, &c.,

W. BARNETT SMITH,

Town Clerk.

Register.—J. D., 3/8/94.

On the 30th ultimo the Mayor and another gentleman called upon Mr. Bagge with reference to this question of the spoil, and I was asked to see them. I told them that, in accordance with the terms of the contract, the contractors (Messrs. Carter & Co.) had to remove the surplus material from the shafts to such places as they were ordered, and that they were paid at the rate of 1s. per cubic yard. I do not see what we have to do with any private arrangement which the contractors may make for its removal. We do not require the spoil, and Carter & Co. have disposed of it as they have thought proper, and I was not, therefore, aware that they were receiving payment from the local Council. The question that now arises is whether the request of the Council can be complied with. We have full power under the contract to ask the contractors to deliver to such places as the Council may point out to us from time to time, and it would not entail any extra cost to us, provided the tip was within half-a-mile of the shaft or open cutting, as the case might be. It will give a little trouble, but I am inclined to think that the Council's request should be acceded to.—J. D., 6/8/94. Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage.

The Mayor of North Sydney did call here respecting this matter, when I called Mr. Davis in, and his suggestions I beg now to recommend to the consideration of the Engineer-in-Chief.—C. H. OHLFSEN BAGGE, 6/8/94. Engineer-in-Chief.



J. Davis.

2 Sept., 1896.

The Engineer-in-Chief for Sewerage to Supervising-Engineer Davis.

*Minute Paper.**Subject:—*Council Clerk, North Sydney—Application for Surplus Material.Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 7 August, 1894.

INFORM Council as no application was made for the surplus material, and, as it was not required by the Department, contractors were allowed, as is usual in similar cases, to dispose of it as they thought proper, no questions, of course, being asked as to payments for same.

Before contractors can be instructed as to placing material in situations suggested by the Council it will be necessary for the Council to specify the exact spots where the material is required, as the Department will not pay a greater distance than the minimum specified, viz.,  $\frac{1}{2}$  mile. R.H., 8/8/94.

Contractors and Council Clerk informed, 8/8/94. Mr. Weedon to see.—J.D., 9/8/94. Seen.—S.H.W., 11/8/94. File.—J.D., 11/8/94.

The Council Clerk, North Sydney, to The Engineer-in-Chief for Sewerage.

Sir,

Borough of North Sydney, Town Hall, 10 August, 1894.

I am directed to acknowledge the receipt of your letter, dated 8th instant, on the subject of ballast from sewer-shafts, North Sydney, and to inform you that a further communication will shortly be made to you, this being merely an intimation that your letter has been received.

I have, &c.,  
W. BARNETT SMITH,  
Town Clerk.

The Council Clerk, North Sydney, to The Engineer-in-Chief for Sewerage.

Sir,

Borough of North Sydney, Town Hall, 14 August, 1894.

In reply to your letter, dated 8th instant, with reference to the surplus material from sewer contract in this borough, I am directed by the Mayor to thank you for your attention to the matter, and to request that the material may be deposited at the junction of Arthur-street and Lavender-street, or in Miller-street, opposite St. Peter's Presbyterian Church, subject to the conditions mentioned in your letter.

With reference to the suggested refund of £123 9s. 4d., I am directed to point out that this money was not paid to the contractors, as you seem to consider, but to men specially employed by the Council.

The Mayor will feel obliged if you can, therefore, see your way clear to refund to the Council the amount in question.

I have, &c.,  
W. BARNETT SMITH,  
Town Clerk.

Arthur and Lavender Streets would be within half-a-mile of all the shafts, and Miller-street, opposite St. Peter's Presbyterian Church, also, excepting the shaft in Campbell-street, the material from which could be taken to Arthur and Lavender Streets. The contractors might be instructed to deliver the surplus material to these places. The Council appear to have made special arrangement with Messrs. Carter & Co.'s draymen, to deliver the surplus material where they required it. I cannot see what power we have to call upon these men to repay the money to the Council, even supposing it would be advisable to do so, which I very much question.—J.D., 17/8/94. Engineer-in-Chief.

Approved.—R.H., 17/8/94. Mr. Weedon to see that the surplus material is delivered to the places named.—J.D., 21/8/94. Mr. Weedon.

The contractors are stacking the balance of the spoil from tunnel for purposes of refilling. It is doubtful whether there will be any more surplus material on this contract.—S.H.W., 22/8/94. Mr. Davis.

Seen. File.—J.D., 24/8/94.

15528. Will you turn now to Contract 77;—with regard to the cost of that portion of the work which is Monier-work, I believe you have made a calculation? Yes; it is as follows:—

## NO. 5.—MEMORANDUM AS TO COST OF "MONIER" WORK ON CONTRACT NO. 77.

| Description of Work.  | Unit.        | Quantity arranged by Messrs. McCredie, Thompson, & Davis. | Rate.               | Amount.              | Amount.     |
|---|--------------|---|---------------------|----------------------|-------------|
| Monier structure .....  | Cub. yards   | 1,533   | £ s. d.<br>*3 16 10 | £ s. d.<br>5,889 5 6 |             |
| Ironwork, excluding grill .....   | Tons .....   | 18.2  | 20 0 0              | 364 0 0              |             |
| Expansion joints .....  | Each .....   | 140   | 1 10 0              | 210 0 0              |             |
| Rendering, 1 to 1 .....   | Sq. yards... | 10,625  | 0 1 10              | 973 19 2             | 7,437 4 8   |
| Bluestone concrete in piers, &c. ....   | Cub. yards   | 158.213   | 2 10 0              | 396 13 4             |             |
| Sandstone concrete in piers, &c. ....   | "            | 1,350   | 1 8 0               | 1,890 0 0            |             |
| Cement facing, 2 to 1 .....   | Sq. yards... | 1,016   | 0 2 3               | 114 6 0              |             |
|   |              |   |                     | 2,400 19 4           |             |
| Deduct 28½ per cent. in accordance with tender .....  |              |   |                     | 684 5 6              |             |
|   |              |   |                     |                      | 1,716 13 10 |
| Sewer in tunnel, common to both aqueduct designs, deducting 28½ per cent. in accordance with tender (see attached sheet). |              |   |                     |                      | 6,340 9 11  |
| Total .....   |              |   |                     | £                    | 15,494 8 5  |

\* Mr. Bagge's estimate for this class of work, made in connection with Contract No. 112, was £4 and £4 10s. per cubic yard (see Parliamentary papers).

QUANTITIES

QUANTITIES common to "Monier" and Departmental designs in tunnels, roadways, &c., &c., not including aqueducts (30·02 chains aqueducts).

J. Davis.  
2 Sept., 1896.

| Item.     | Description of Work.      | Unit.              | Quantity. | Rate.   | Amount.    |
|-----------|---------------------------|--------------------|-----------|---------|------------|
|           |                           |                    |           | £ s. d. | £ s. d.    |
| 1         | Excavation .....          | Cubic yards .....  | 4,243     | 0 2 0   | 424 6 0    |
| 2         | " .....                   | " .....            | 140       | 0 7 0   | 49 0 0     |
| 3         | " .....                   | " .....            | 1,160     | 0 6 0   | 348 0 0    |
| 4         | " .....                   | " .....            | 90        | 3 5 0   | 292 10 0   |
| 5         | " .....                   | " .....            | 100       | 3 0 0   | 300 0 0    |
| 6         | " .....                   | " .....            | 1,000     | 2 17 6  | 2,375 0 0  |
| 7         | " .....                   | " .....            | 70        | 0 6 0   | 21 0 0     |
| 8         | " .....                   | " .....            | 4         | 1 2 6   | 4 10 0     |
| 9         | " .....                   | " .....            | 70        | 1 0 0   | 70 0 0     |
| 10        | " .....                   | " .....            | 2         | 1 10 0  | 3 0 0      |
| 11        | Filling .....             | " .....            | 2,300     | 0 1 0   | 115 0 0    |
| 13        | Sandstone ballast .....   | " .....            | 740       | 0 4 0   | 148 0 0    |
| 14        | Bluestone metal .....     | " .....            | 370       | 0 12 0  | 222 0 0    |
| 15        | " screenings .....        | " .....            | 180       | 0 5 0   | 45 0 0     |
| 16        | Subducts .....            | Lineal yards ..... | 50        | 0 1 6   | 3 15 0     |
| 17        | Timber .....              | Cubic feet .....   | 300       | 0 1 8   | 25 0 0     |
| 18        | Piling .....              | Lineal feet .....  | 960       | 0 4 0   | 192 0 0    |
| 27        | Curbing .....             | " .....            | 650       | 0 2 6   | 81 5 0     |
| 26        | Ashlar .....              | Cubic feet .....   | 130       | 0 3 0   | 19 10 0    |
| 28        | Gully covers .....        | Each .....         | 4         | 0 18 6  | 3 14 0     |
| 30        | Bluestone pitchers .....  | Square yard .....  | 8         | 0 12 6  | 5 0 0      |
| 31        | Freestone .....           | Rod .....          | 320       | 0 8 0   | 128 0 0    |
| 32        | Fencing .....             | " .....            | 50        | 0 18 0  | 45 0 0     |
| 33        | " .....                   | " .....            | 100       | 0 8 0   | 40 0 0     |
| 34        | 21-inch pipes .....       | Lineal yard .....  | 120       | 1 13 0  | 198 0 0    |
| 35        | 12 " .....                | " .....            | 20        | 0 6 9   | 6 15 0     |
| 36        | 9 " .....                 | " .....            | 15        | 0 5 0   | 3 15 0     |
| 38 and 39 | Surplus material .....    | Cubic yard .....   | 4,580     | 0 1 1   | 248 1 8    |
| 40        | Fixing ironwork .....     | Cwt. .....         | 55        | 0 4 0   | 11 0 0     |
| 41        | Flap-traps .....          | Each .....         | 10        | 1 5 0   | 12 10 0    |
| 19        | Sandstone concrete .....  | Cubic yard .....   | 322       | 1 8 0   | 450 16 0   |
| 20        | Bluestone .....           | " .....            | 707       | 2 10 0  | 1,767 10 0 |
| 22        | Brickwork .....           | " .....            | 156       | 2 10 0  | 390 0 0    |
| 23        | Rendering, 1 to 2 .....   | Square yard .....  | 2,835     | 0 2 3   | 318 18 9   |
|           |                           |                    |           |         | 8,867 6 5  |
|           | Deduct 28½ per cent. .... |                    |           |         | 2,527 16 6 |
|           | Total .....               |                    |           |         | 6,340 9 11 |

15529. In making this estimate you have worked upon the quantities arranged by Mr. McCredie, Mr. Thompson, and yourself? Yes; and I have used the schedule rates as far as they apply, deducting the 28½ per cent., so that it narrows it down to the price per cubic yard of the Monier structure.

15530. Your figures show that the cost of the work, calculated upon that principle, would be £15,494 8s. 5d.? Yes.

15531. Which is substantially the same as the amount for which the contract was let, namely, £15,500? Yes.

15532. I suppose it took you a considerable time to work out these quantities? Yes.

15533. You have spent a good deal of time over them, and you have employed others to assist you? Yes.

15534. It is not a thing which has been done in a day or two? No. In all probability, if an estimate had been made by Mr. Bagge at the time the tender was accepted he would have made it more. If the contract had then been referred to Mr. Bagge for an estimate, then, judging from what he did a few months previously in the case of another work, his estimate would have been considerably more than mine.

15535. With regard to Contract 118, there is a charge made by Mr. Parkes to the effect that the contractors were allowed to have the benefit of labour performed by the unemployed, paid by the Crown, in draining their works, for which drainage the contractors had to take the responsibility under their agreement with the Crown. Some evidence has been tendered with regard to that matter. Can you offer any explanation? The first I heard of it was very early in the progress of 118. Mr. Millner, the officer-in-charge, came to me one morning—he has already given evidence on the point—and he said that it was impossible for Carter, Gummow, & Co. to proceed with their contract at the same time that the reclamation was being proceeded with. It was pointed out that the sand-pumps which were working there, throwing up sand and water, were flooding the channel.

15536. *His Honor.*] Were they throwing sand and water on to the land side of the retaining bank? Yes. The first thing done at Johnstone's Bay was to construct a dyke. That formed the outside limit of the reclamation seaward, and then the sand-pumps were sent there, and they threw up sand on to the inside of the wall.

15537. They were working on the outside and throwing up on to the inside? Yes.

15538. And with the sand a lot of water would be thrown up? Yes; probably 95 per cent. of what the sand-pumps threw up would be water. That must find its way back again into the bay.

15539. By the channel of the creek? Yes; supposing the channel to be in existence. But in this particular case there was no channel. The reclamation had virtually blocked the original channel, and, as a consequence, as the water was thrown up by the sand-pumps on to the reclaimed area it certainly flowed off towards the bay, but it also flowed off towards Carter, Gummow, & Co.'s works.

15540. And backed up the whole creek? Yes. Carter, Gummow, & Co. could not proceed with their work. Mr. Hickson and I went out one morning to look at it. We saw the man in charge of the reclamation, and Mr. Hickson instructed him to cut a channel, which is usually done in all such cases, to allow the water to find its way back again into the bay, instead of part of it going towards Carter, Gummow,

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Gummow, & Co.'s works. The men were put on to do this work. I ought to explain that Carter, Gummow, & Co. had two pumps which were quite sufficient to deal with the water which they could be legitimately asked to pump out of their works, but they had made no provision to cope with the water from the sand-pumps, so that it meant this, that, unless something were done in the way of cutting a channel, Messrs. Carter, Gummow, & Co. must stop their work, or the reclamation works must stop. One or the other had to be done.

15541. *Mr. Smith.*] The clause referring to the unwatering of the contract is, I think, clause 85, which appears on page 409 of the Parliamentary Return? Yes; it is as follows:—

85. All water, which, during the progress of the work, may drain to excavations, to be properly, effectively, and continually pumped out, and the whole to be kept dry until after the completion, setting, and hardening, of all brick and concrete work and pipe sewers, at the sole cost of the contractor. The greatest care to be taken to prevent running water passing over any of the brick, concrete, and pipe-work, until it has set perfectly hard; any concrete, mortar, and cement jointing, exposed to wash of water must be taken up at once, and replaced by fresh concrete, mortar, and jointing, at contractor's expense.

15542. Look now at clause 83, upon the same page? Yes; that is as follows:—

83. During the construction of these works the contractor shall, at his own cost, do all work which may be required for the effectual diversion of surface-water, subsoil-water, and storm-water, across and beyond the site of the works, to keep the trenches free from water during the whole time the works are in progress, and in preventing any injury to the works by floods or any other causes.

You will see that the one clause deals with sewage, and that the other deals with water.

15543. You and Mr. Hickson did not consider that these clauses applied to a case where the water was really brought on to the site of the works by the Department itself? Certainly not. The first clause deals with surface-water, subsoil-water, and storm-water, and by no stretch of imagination could you bring under that clause sea-water which was pumped on to the contract by sand-pumps. The second clause to which you have referred me deals with sewage.

15544. *Mr. Carter.*] Referring to the matter of personal securities, with the exception of Contract 69 and Contract 77, where both securities were given, were personal securities ever accepted for any of our work by your Department? No, not to my knowledge. There was a special reason for it. It has not been the practice of the Sewerage Branch, although it has been the practice of the Roads and other branches, to accept personal securities. In the case of the Sewerage Branch, we have always taken a fixed deposit.

15545. A different course was taken in the case of Contract 69 only, on account of our taking Treasury bonds in payment? Yes, that was the reason—the only reason.

15546. Referring to the question of the disposal of surplus material, do you not as a rule throw the onus of taking the necessary steps for that on to the contractors? Yes.

15547. It is often a difficult matter to deal with? Yes.

15548. Consequently the contractors are permitted, as you said this morning, to dispose of the surplus material as they think fit, providing you do not want it for any special purpose? Yes, that is the practice, not only in the case of sewerage works but in the case of every public work, I believe.

15549. *Mr. Smith.*] As to charge No. 3, affecting Contract 79, that of manipulating items in the schedule of Messrs. Carter, Gummow, & Co., so as to increase the profits of contractors to the loss of the Crown, you have, I believe, made a short memorandum? Yes; it is as follows:—

MEMO. No. 6.—SUBSTITUTION OF BLASTING FOR GUTTERING AND GADDING, &c. (*Vide Appendix No. 71*).

When the shafts were sunk to the level of the tunnels, and the contractors were about to start driving, comparative estimates were made for the different modes of excavating the tunnel provided for in the schedule. Although the price for guttering and gadding was somewhat above that for blasting—taking into consideration the fact that if the tunnels were driven by the latter means they could not be taken out to the precise size required, and therefore more concrete would be used in the lining than if the excavation were done by guttering and gadding—it was found the Department would effect a saving of about £1,250 on the whole length of the tunnels, if they were taken out without the use of explosives. The contractors saw the Engineer-in-Chief in my presence respecting the matter, and offered, if they were allowed to do the excavation by the use of 4 inches of compressed powder, to allow an equivalent to the above sum in the quantity of concrete paid for. On these conditions the Engineer-in-Chief approved of the excavation being done by blasting, and the work was carried out accordingly; and in the final voucher the concrete which was included was reduced equal to £1,302 9s. 8d., as the following statement will show:—

|                             |     |     |     | <i>Sandstone packing in tunnels paid for.</i>     |             |         |       |
|-----------------------------|-----|-----|-----|---|-------------|---------|-------|
| Total amount                | ... | ... | ... | 13,255  | 96          |         |       |
| Less Ernest-street          | ... | ... | ... | 1,877   | 60          |         |       |
|                             |     |     |     | 11,378·36 cubic feet = 421·42 cubic yards.        |             |         |       |
|                             |     |     |     | <i>Bluestone sewer lining in tunnel paid for.</i> |             |         |       |
| Total amount                | ... | ... | ... | 35,868  | 24          |         |       |
| Less Ernest-street          | ... | ... | ... | 2,928   | 58          |         |       |
|                             |     |     |     | 32,930·66 cubic feet = 1,219·98 cubic yards.      |             |         |       |
|                             |     |     |     | <i>Summary.</i>                                   |             | £ s. d. |       |
| Sandstone packing (actual)  | ... | ... | ... | 797·70  | cubic yards | 1,495   | 13 9  |
| Sandstone packing paid for  | ... | ... | ... | 421·42  | "           | 790     | 3 3   |
| Difference                  | ... | ... | ... | 376·28  | " at 37/6   | £705    | 10 6  |
| Bluestone in sewer (actual) | ... | ... | ... | 1,433·18  | "           | 4,012   | 18 1  |
| Bluestone in sewer paid for | ... | ... | ... | 1,219·98  | "           | 3,415   | 18 11 |
| Difference                  | ... | ... | ... | 213·20  | " at 56/-   | £596    | 19 2  |

*Final*

*Final Voucher.*J. Davis.  
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When the whole of the work was finished, including the small extension at Ernest-street, which cost £1,220, another at the outfall, Long Bay, and some work in connection with the reticulation at Maclean-street, the total cost of the contract amounted to £40,023 10s. 3d. The amount of the tender for Contract No. 79 alone was £39,890. It will, therefore, be seen that there was a considerable saving on the contract. (*Vide Appendix No. 72.*)

*Ernest-street Branch.*

The Ernest-street Branch Extension was carried out in order to intercept the sewage from a large district (which had been reticulated) and divert it into the main outfall sewer at the earliest possible moment. In addition to this the work was more economically performed in conjunction with Contract No. 79 than it otherwise could have been at a later date.

*High-street Branch.*

An extension was also given in conjunction with Contract 79A, called the High-street Branch. This was also constructed, as it was urgently needed to enable a district to be reticulated. It was found that by carrying out this branch in conjunction with Contract No. 79A, a less number of shafts would be required, and the cost would, therefore, be correspondingly reduced.

It is not infrequent for extensions of contracts to be made to suit the convenience of the Department. The following might be instanced as examples:—

Rookwood Cemetery.  
Rushcutter's Bay Stormwater Channel.  
Stormwater Channel, Burwood.  
Long Cove Creek Stormwater Channel, Ashfield.  
Long Cove Creek Stormwater Channel, Henson-street Branch.  
Outfall Works at Bondi.

Indeed it may be said that it would be difficult to find any contract of magnitude to which, during the progress of the work, circumstances did not require some extension to be made.

15550. *Mr. Carter.*] In your experience of our firm, as an officer of the Department, can you remember any instance of what may be termed an undue concession being granted to us—that is, a concession which has been refused to any other firm of contractors? No.
15551. I mean in the way of advance on material, refund of retention money, or in any other way that might be suggested? No; I do not think so.
15552. We have been on exactly the same footing as have other contractors? Yes, most decidedly, as far as I am concerned.
15553. *Mr. Smith.*] And also as far as Mr. Hickson is concerned? Yes; I never observed anything in Mr. Hickson's conduct to lead me to suppose that he thought of Carter, Gummow, & Co. in a way different from that in which he thought of other contractors.
15554. *Mr. Carter.*] As to the advances on cement—is it not a fact that other contractors received that concession, if it can be called a concession, much earlier than we did? It has been the practice to advance on material since I have been in the Sewerage Branch—a matter of thirteen years.
15555. We were refused advances on material on more than one occasion when other contractors had obtained them? I know that for some years it was a practice to make advances on material. It was discovered, however, that it caused so much trouble that the practice was discontinued. We used to give advances on plant as well, and that practice was also discontinued. The matter was afterwards reconsidered, and it was thought to be only a reasonable thing to make the advance. Your firm of contractors have not been specially dealt with since the resumption of the practice of making advances.
15556. *Mr. Parkes.*] Upon what date was the practice of making advances on material discontinued in the first instance? I could not give it to you just now, but I could get it.
15557. When was it resumed? It was resumed probably four years ago.
15558. Could you get the exact dates of the discontinuation and the resumption? Yes.
15559. You have not made the Commission acquainted with details showing how you make out the value of the Monier work in Contract 77;—could you supply those details? I have them. I dare say that if necessary I could put them in.
15560. *His Honor.*] At all events you could prepare yourself by reference to your notes to answer any questions as to the details which Mr. Parkes may see fit to ask you at the next meeting of the Commission? Yes.
15561. *Mr. Parkes.*] With reference to allowing this firm of contractors to put in personal securities when they had undertaken to receive payment in funded stock, how many cases do you say there were in which personal sureties were accepted? There are a number of cases. I should think there would be a dozen in the Sewerage Branch alone. Mr. Norrie handed in a list of them.
15562. But at the particular time at which Messrs. Carter, Gummow, & Co. received this concession there were three cases? There were three tenders accepted at the same time, but there were a number of others afterwards accepted on the same condition, and in which the contractors were allowed a like privilege.
15563. But I mean at that time? On that occasion, that is so.
15564. Mr. Gilliver sent in the name of his son as a surety? I could not say.
15565. Do you know whether his son was rejected as a surety? I could not tell you; I should have to look that matter up.
15566. Mr. M'Arden was proposed as a surety for Mr. Ahearne, was he not? Yes.
15567. And was Mr. M'Arden objected to? I think he was not exactly objected to, but Mr. Hickson said that inquiry should be made as to his financial stability.
15568. Were inquiries made as to the financial stability of the sureties in both Gilliver's and Ahearne's cases? I do not think there were any inquiries except such as would generally take place—those which Mr. Darley explained to the Commission were generally made in the case of personal sureties. I do not think there was any inquiry beyond that.

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15569. Were those two contractors, Mr. Gilliver and Mr. Ahearn, not called upon to come to the office and were they not questioned about their sureties? Mr. Ahearn was.
15570. Was not Mr. Gilliver asked? I should have to make inquiry about that.
15571. Did not Mr. Gilliver himself protest to you that his son was a man of property, and that he could prove it? He did not.
15572. Did he not do so to Mr. Hickson? He may have done so to Mr. Hickson, but he did not do so to me.
15573. Did you not hear of his son's being objected to on account of his relationship? No; I know that Mr. Gilliver has a son who is employed by the firm of Gilliver and Curtis on their contracts. Further than that I do not know anything about him.
15574. Were any inquiries made as to Henty and Scrutton as sureties for Messrs. Carter, Gummow, & Co.? I scarcely think there would be any. It would be unnecessary in a case like that. They were merchants of standing, and would be accepted without inquiry, I take it.
15575. Had you the firms as sureties? By inquiry we could not get to know much more of them and of their position than we knew already.
15576. What did you know? We knew of the firm of Parbury, Henty, & Co., of which Mr. Henty was a member. We knew that they were in a large way of business as merchants, and the same thing of course applies to Mr. Scrutton.
15577. But you had the individuals, not the firms, had you not? I am only a layman, and it is possible that I may have made a mistake in supposing that if we had members of the firm we had the firm itself. I am told that that is not the case.
15578. But were any inquiries at all made as to these securities? I should scarcely think there would be any.
15579. As to Contract 72, is it not a fact that work was done on that contract up to February, 1892? Do you mean the lower portion of the work?
15580. I mean any portion of the contract? It was going on almost to the end of 1892, I think.
15581. But a stoppage took place in 1891, did it not? In October, 1891, the contractors were informed that they would not be allowed to proceed beyond a certain point.
15582. But the work was going on all the same? It was being brought to a conclusion.
15583. It was not actually stopped? Notice was given in October that the work would not be continued beyond Macdonald-street, but the contractors between October and the date on which the work may have been finished would have had to continue work.
15584. It was in the contractors' hands in April, 1892, was it not? I do not think it was ever out of their hands until it was finished, and that was at the end of 1892.
15585. There was not any actual stoppage of the contract? Yes; it was stopped, as I say, from October to April.
15586. Were they working during that time on the part of the contract you speak of? There was no work done on the contract between the foot of Macdonald-street and Munni-street between October and April.
15587. Was work done on other portions of the contract? It was being brought to a conclusion, as I have already explained.
15588. Work was being done on other portions of the contract? Below the foot of Macdonald-street.
15589. Vouchers, as a matter of fact, were paid up to the end of April, were they not? It may be so, or not. I do not know without referring to the vouchers, but that would not necessarily mean that the work was in progress.
15590. But a voucher was paid in January and another was paid at the end of February showing an increase of work;—that work must have been done between January and February? Not necessarily at all. At the end of a work of that nature there are always a number of things left to be squared up when the work is finished.
15591. As a matter of fact there was no cessation of the work upon the contract. There was only a notification of one end being taken off? There was a cessation of work upon the upper portion of the contract.
15592. But not all over the works? I have explained that notice was given to the contractors in October 1891, and under that notice they were not to proceed with work beyond the foot of Macdonald-street.
15593. But they were going on with the other portions of the contract? They had to finish up to the point beyond which they were informed they were not to proceed.
15594. There was never any real discontinuance of work. They did not leave the job? The job was finished to the foot of Macdonald-street, and then, as I had stated, nothing was done until the beginning of April, when they were instructed to proceed with the upper portion.
15595. Were they not going on with the lower portion during the months of January and February? I think the work on the lower portion would be finished in November or December. It may have been that at the latter part of December there would be a little bit of rendering to repair, but I think the bulk of the work was finished in November.
15596. Will you swear that no work was done in January or February? If you want definite information about it I will look it up and give it to you.
15597. But will you, yourself, swear that no work was done in January or February? I would not like to swear about that without refreshing my memory, but what I will swear is this—that the contractors received notice in October to discontinue the work at the foot of Macdonald-street, and that there was very little done after that. They were working about Mitchell's Road, and there could be only a little bit of concrete to do before they got to the foot of Macdonald-street, when they would have to cease.
15598. On what date was the extra channel which was cut given to them? To what do you refer?
15599. I mean the channel that made an opening from the canal to Shea's Creek? That was the first thing that was done.
15600. It was not in the first contract? Yes; it is shown in the contract drawing.
15601. Was it part and parcel of the contract? Yes.
15602. Was it signed for as part of the contract? To the best of my belief—yes.
15603. Was it not afterwards referred to as extra work? I think it was not included in the probable quantities given in the schedule, and it increased the contract to that extent.

15604.

15604. The original contract as signed was £20,000? That was working it out at schedule rates, but we took power to reduce it. J. Davis.
15605. When you started them with an extra piece of work which was supposed to be taken off and not constructed? No. 2 Sept., 1896.
15606. For instance, in Mr. Bagge's explanation of the reason why Parliament was asked for an extra amount of £9,000, he states that when this contract was let he found that there was no opening—that it was filled with deposit;—was not that so? I do not know to what you refer.
15607. If you look at the schedule of Contract 69, you will see an item of 9,000 cubic feet of timber—is not that so? Yes.
15608. And the whole of the timbering paid for was 9,000 cubic feet? Yes.
15609. So that it was anticipated that the large excavation would be done, was it not? I do not think so. It could not have been, or greater provision would have been made in the excavation.
15610. How comes it that provision was made for that amount of timbering? It must have been measured off some how.
15611. What was it measured off? It was an approximate amount. No one quite knew how much timber would be ordered to be left in. Take the shafts for instance. The shafts might be in soft ground and yet the timber might be withdrawn, and in that case the timber would not be paid for. So that you cannot draw any comparison between the excavation in soft ground and the item of timbering, for that reason.
15612. But are not the quantities of the schedule measured off any definite thing? The timbering is purely a problematical item. Supposing you have soft ground, it does not follow that you will have to pay for the timbering. You do not pay for the timbering wherever there is soft ground. You pay for whatever timbering it is necessary to leave in.
15613. *His Honor.*] It is principally in the drives that the timbering is left in? In the case of the tunnels we have to leave it in.
15614. It is not left in so much in the case of the shaft? No.
15615. Even though the ground be soft? No; it is put in in such a way that it can be withdrawn.
15616. And as a matter of fact it generally is withdrawn? Except in the case of deep shafts. There might be a little danger in withdrawing it in such cases. Even then, however, it is sometimes withdrawn. In the case of open cuttings it is invariably withdrawn.
15617. However soft the ground? Yes.
15618. The Department prefer to have the timber withdrawn rather than covered up. If it is practicable and safe to have the timber taken out of the ground and the ground filled in solid, the Department prefer, as a rule, that that should be done? Yes; because the timber must eventually rot. It is, therefore, never left in unless it is absolutely necessary to do so.
15619. *Mr. Parkes.*] The difference between schedule and the actual payment is something like 6,000 cubic yards in the tunnel and excavation? I said something of the sort in my memorandum, I think.
15620. The contract was let on 8th January, 1894? The tender was accepted on 27th December, 1893—that is the time the contract was let. The date of completion is taken from the date of the acceptance of the tender. That is the time from which we date the duration of the contract.
15621. Not from the time the contractor signs? No.
15622. Suppose you accept a tender and the contractor does not sign the contract for three months? That is his fault. To begin with, we would not allow it to go for three months. The contract would be cancelled. Of course, if the contractor withdraws there is a formal cancellation.
15623. On 18th January, 1894, you wrote the letter which appears upon page 123 of the Parliamentary return, enclosing a list of the sizes of the shaft excavation. Upon the margin of that letter you figured all the sizes of the various sections requiring timber, did you not? Yes; that must be so.
15624. You figured the exact size of the timbering in the letter, a copy of which I now produce? I do not know that I figured the exact size.
15625. Is not the copy I produce an exact copy of what you wrote? It seems to be so.
15626. Is not the size of each section requiring timbering given in the margin? Yes; but they are very indistinct in this copy.
15627. You can read the figures distinctly enough, can you not? Not in the case of the third section—it is obliterated.

FRIDAY, 4 SEPTEMBER, 1896.

George Christie recalled and further examined:—

15628. *Mr. Parkes.*] You have obtained information as to the value of properties in the name of Mr. George Forrest in New Zealand? Yes. I have obtained full information from the Land and Income Tax Department as to the freehold property held by Mr. George Forrest in that Colony. G. Christie.  
4 Sept., 1896.
15629. How did you obtain that information? Through Mr. J. C. Gavin, who is the Deputy Auditor-General of New Zealand, and a personal friend of mine. He has forwarded me an official letter, signed by Mr. John McGowen, the Commissioner of Taxation. I have prepared the following memorandum, dealing with the matter:—

MEMO. No. 21.—*Re Mr. George Forrest's Property in New Zealand.*

(a) Since giving evidence on 21st August relative to the financial position of Messrs. James Gillan and George Forrest in connection with their bonds, Contract 77, as per my Memo. No. 19, I have obtained a statement of the real property assessed in the name of Mr. George Forrest by the Land and Income Tax Commissioner of New Zealand.

(b) This statement is contained in a letter of the Commissioner (Mr. John McGowen), dated Wellington, 21st August, 1896, and is addressed to Mr. Gavin, the Deputy Controller and Auditor-General of New Zealand, whom I have asked to obtain the information.

(c) The properties enumerated in this statement correspond with those in the certificates of the Valuator of the Borough of South Dunedin, and also include one additional property in another Borough.

This additional property is of the value of £28, and is described as follows:—"In the Borough of St. Kilda, a vacant allotment, sec. 7, blocks 13, 20 poles; value, £28."

The letter is appended hereto.

4/9/96.

GEO. C.  
The

G. Christie. The letter is as follows :—  
4 Sept., 1896.

Dear Mr. Gavin, Land and Income Tax Department, Wellington, 21 August, 1896.  
Referring to your inquiry as to the real property assessed in the name of Mr. George Forrest, of Sydney, I find that the only land assessed to that gentleman is as follows :—  
In the Borough of South Dunedin, sections 12, 13, block 10,  $\frac{1}{2}$  an acre, £525 (which value includes two cottages assessed at £325, the land representing the difference); in the Borough of St. Kilda, a vacant allotment, section 7, block 13, 20 poles, value £28. There is no property in George-street, Dunedin, assessed in the name of Mr. Forrest; but I find that in George-street, South Dunedin, there is a vacant allotment, section 4 of block 6, 5 poles, valued at £20, and sections 24, 25, and 26, in the same block, 16 poles, valued at £245, the house on which is worth £200—the land representing the difference; but these are assessed in the name of Mrs. Forrest, and the locality is entirely different, being miles away from George-street, Dunedin, which is one of the principal streets in the city.  
There is no secrecy with regard to the assessment of real property, and you are therefore perfectly in order in making the inquiries you have made. Your correspondent evidently does not know the Land Tax Department in New Zealand, or else he would have known that any such inquiry from New South Wales would have been attended to with the utmost promptitude. The "Tasmania" leaves this afternoon at 3 o'clock, due in Sydney on the 28th instant. The direct steamer left on Wednesday, and perhaps, therefore, you had better send your letter by the "Tasmania."  
Yours, &c.,  
JOHN M'GOWEN,  
Commissioner.

William James Millner recalled and further examined :—

W.J. Millner. 15630. *Mr. Davis.*] In conjunction with Mr. Thompson, acting on behalf of Mr. Parkes, you have made an examination of the Alexandria Park sewer? Yes.  
4 Sept., 1896. 15631. When did you make that examination? On last Friday and on last Tuesday.  
15632. Will you tell His Honor what occurred on Friday last? We met Mr. Wright out there, and he selected a spot where a hole was put down. We made one hole a foot right round to a depth of over 8 inches, and we found concrete at the bottom and right through. We commenced another hole, but we did not finish it that night. We went back on the Tuesday morning, and we then got down to a depth of 6 inches in the second hole. Afterwards, according to instructions, we went down a further 3 inches.  
15633. How far was the first hole from the outlet? About 10 feet.  
15634. How far was the second hole from the outlet? About 30 feet.  
15635. In either case did you go through the concrete? No.  
15636. What was the class of concrete that you passed through? It was all blue-metal concrete.  
15637. Do you consider it good and satisfactory work? Yes, it was as sound as a bell.  
15638. *His Honor.*] How far from the centre of the invert were the holes you made? They were made right in the centre of the invert.  
15639. *Mr. Parkes.*] What is your position in the Government service? I am Assistant Engineer for Sewerage.  
15640. When did you get in the Government service here? About seventeen years ago.  
15641. Where were you previous to joining the service of the Government of New South Wales? I was in the service of the Government of South Australia.  
15642. What position did you occupy there? I was in the Engineer-in-Chief's office.  
15643. In what branch—are there not branches to that office? The whole office was under one man when I was there.  
15644. On what date did you leave South Australia? Seventeen years ago.  
15645. Do you remember the month? I left there shortly after the Christmas holidays, I think, and I arrived here early in January.  
15646. Why did you leave South Australia? I left of my own accord.  
15647. Did you resign? They were advertising for men over here. I saw the advertisement, and came over. I came on a holiday.  
15648. But did you resign from the South Australian service? I did.  
15649. You sent in your own resignation? Yes.  
15650. What were you doing there? I was on railway or water works—just as they had work for me to do.  
15651. Was there any trouble about public works in Adelaide at the time you left? Not that I know of.  
15652. Was there any Board of Inquiry? I could not say.  
15653. Do you not recollect some disturbance in connection with public works there? No.  
15654. Did you get work here immediately? I applied to Mr. Whitton, and on the strength of my testimonials he gave me a position.  
15655. In what position did you make a start? As a surveyor in the Railway Department.  
15656. When did you come to the Sewerage Branch? At about the time of Mr. Bennett's death.  
15657. After Mr. Bennett died? Yes.  
15658. What was the first thing you did in the Sewerage Department? I set out the western suburbs branch.  
15659. Did you know Mr. Hickson when he was in Adelaide? I did not.  
15660. What contracts have you been on in the Sewerage Branch? I was on Contract 62.  
15661. Whose contract was that? M'Sweeney's.  
15662. And after that? On contract 64—Carson's contract.  
15663. And after that? On No. 101—Ahearne's.  
15664. After that? I think I was on some works between those contracts. I was on No. 69—Carter, Gummow, & Co.'s.  
15665. And after that? After that I was on No. 118—also Carter, Gummow, & Co.'s.  
15666. Did you ever take a commission to back horses for a contractor? No.  
15667. Are you sure of that? I have backed horses.  
15668. For a contractor? Yes.  
15669. That contractor was the owner of the horses, was he not? I could not say.  
15670. You were paid a commission for doing it? No.  
15671. Are you sure of that? Quite certain.  
15672. *Mr. Davis.*] Were you working under Mr. Hickson in South Australia? No.  
15673. You did not know him there? No.  
15674. After you left the Railway Department you were employed by Mr. Bennett? Yes.  
15675. On what work were you engaged with Mr. Bennett? On the Centennial Park work.



15676. When you had finished that work did Mr. Bennett make any promise to you? He told me that I was to be transferred to the Sewerage Branch. W.J. Millner.
15677. So that when you were brought into the Sewerage Branch it was simply in fulfilment of a promise which Mr. Bennett had made to you before his death? Yes. 4 Sept., 1896.
15678. Did you hear of any public works trouble in Adelaide before you left that colony? I do not know of any.
15679. Did you hear of any commission having been appointed to inquire into any public works in South Australia? No.

Joseph Davis recalled and further examined:—

15680. *Mr. Parkes.*] When you prepared the papers in connection with these contracts for presentation to Parliament did you do so with the object of their being printed? I did not know whether they were to be printed or not, but I assumed that probably they would be. J. Davis.
15681. Do you not know that when papers are moved for they are wanted for the perusal of Members of Parliament? I do not know for what purpose they are moved for. The member who moves for them would be more likely to know why they are wanted. All that I was concerned with was that papers were asked for, and I took care that all the papers which I thought would be required were sent forward. 4 Sept., 1896.
15682. But when the House makes an order that certain papers be produced, do you not take into consideration the fact that the papers are to be printed? I have already said that I took care to send forward in this particular instance all the papers which, to the best of my belief, were required.
15683. Would it not appear to your mind that the object of asking for the papers would be to see exactly what they were? Of course I assumed that those who asked for them knew what they wanted.
15684. But when Parliament is asking for information from a Government Department, do you not think the fullest information ought to be supplied? Certainly; and in this case I believe it was done. I do not think that anything was knowingly kept back from this return.
15685. Supposing the contract plans were kept back? Those were not regarded as being asked for.
15686. But, seeing that contract plans are the very essence of a contract, ought they not to have been included? If they were asked for, certainly; but in this case they were not.
15687. But, when a motion is made asking for papers generally in connection with contracts, ought not all the vital papers to be supplied? If a general motion had been made, then no doubt one could have used one's discretion a little bit; but in this particular instance there was not a general motion. The motion asked for specific things.
15688. But where do you get any right to exercise discretion in the placing of papers before Parliament? I did not say that I had any right to exercise a discretion. What I say is, that when we are endeavouring to comply with an order of the House we must of necessity use our sense.
15689. The order asked for copies of all papers and correspondence in connection with certain contracts. Ought not all the papers, therefore, to have been supplied? Yes, and they were.
15690. But would not the plans be papers? I do not regard them as papers, and I do not think they are usually regarded as papers.
15691. You used your discretion as to what you would give to Parliament? No, not at all. We gave Parliament what was asked for.
15692. Coming to Contract 72, the plan I place before you is marked "Drawing No. 1"—is that a tracing of the work as completed? I should have to compare the upper portion of the work with another plan already put in before I could speak positively to that.
15693. Does not that plan cover the whole of a contract? Yes; but the upper portion was slightly modified, and I am not sure whether this plan shows the modification or not. Speaking generally it is a correct plan.
15694. Will you point out at what points the signed contract commenced and ended? The contract commenced at Union-street and terminated below M'Namara's dam.
15695. I mean the contract signed by Messrs. Carter & Co. in the first instance? I believe that that was what was signed for, but I would not be positive. The contract drawing would show it precisely. This is not the contract drawing.
15696. *His Honor.*] What is the drawing now before you? It is supposed to be a tracing of the contract drawing. The only question is whether the proposed canal was shown as it is shown here.
15697. *Mr. Parkes.*] Will you point out where the extra piece of work was? I do not say that there was extra work.
15698. What was the total sum of the contract that was signed for? The total sum was really not in existence, because it was a schedule-rate contract. No one therefore could say precisely what the total sum would be until the work was carried out. It was not a lump sum contract.
15699. What was the amount of work signed for in the first instance? It was a schedule rate contract. Therefore no lump sum came into question except for the purpose of estimate.
15700. Will you kindly produce the original contract drawings? I was under the impression that they had been put in.
15701. *His Honor.*] Is the channel shown upon the tracing before you part of the original contract? I am under the impression that this plan shows the modification to which I referred just now in the upper portion of the contract from the foot of Macdonald-street to Union-street.
15702. *Mr. Parkes.*] It is a contract plan, is it not? It is a plan which was prepared some time at the beginning of 1892, after the contract had been carried out up to the foot of Macdonald-street.
15703. In giving your evidence on Wednesday you said in your Memorandum No. 4:—"When the channel was finished or nearly finished up to the foot of Macdonald-street all the money available for the work had been expended. The Engineer-in-Chief then wrote on 13th October, 1891, giving the contractors notice that it was intended not to construct the channel beyond that point." Now, if all the money was expended was not the contract complete? When I say that all the money was expended it must necessarily mean from the context that it would be absorbed by the time the work up to the foot of Macdonald-street was finished.
15704. Was that the amount of the contract which was signed for? I think I have already said many times what was included in the contract, and I have also explained that the contract was a schedule-rate contract. 15705.

J. Davis. 15705. But what was the total sum of the contract? I have already said that it was only for the purposes of estimate that a total sum existed; it was a schedule-rate contract, not a lump-sum contract.  
4 Sept., 1896. 15706. Therefore it might have gone on for 20 miles? Therefore it might have included all that was shown in the drawings.

15707. Was there not in your specification a description of the extent of the contract? There is a description of the extent of the contract generally at the beginning of the specification.

15708. You say:—"The Engineer-in-Chief then wrote on the 13th October, 1891, giving the contractors notice that it was intended not to construct the channel beyond that point." He referred to clause 3 of the specification, which is virtually a repetition of the last paragraph of section 4 of the general conditions, hoping that it would put the idea of a claim out of the contractors' heads." That is how you explain that letter? To what explanation do you refer?

15709. I mean "hoping that it would put the idea of a claim out of the contractors' heads"? You must know, as you have read through these general conditions and the contracts generally, that there are a number of clauses that might very properly be cited in a letter, and that it might, in the opinion of the officer who wrote the letter, be that they would apply. That would be a question to be tested afterwards—whether they did apply or not.

15710. If you will look at paper No. 2, upon page 135 of the Parliamentary Return, you will see a reference to the schedule of prices? That is the way in which all these contracts are accepted. No lump sum is introduced. The Minister accepts the schedule rates for the work in question.

15711. And you may extend the contract as many miles as you like? I do not say that. If you think that a reasonable construction to put upon what I say, I must leave it for you to do so.

15712. Mr. Barling, on the 28th February, 1891, wrote the following letter to Carter & Co. :—

Sir, Department of Public Works, Sydney, 28 February, 1891.  
I have the honor, by direction of the Secretary for Public Works, to inform you that your tender, dated the 18th instant, is accepted for Contract No. 72, Sydney Sewerage, Construction of a Stormwater Sewer, Munni-street to Shea's Creek, at your schedule of prices.

The work is to be carried out in strict accordance with the several contract exhibits relating to this contract, and to be completed within eight months from this date.

I have to refer you to the Commissioner for Roads for further information, and to request that you will call upon the Officer in Charge of Bonds and Contracts at this office, for the purpose of executing the necessary documents for the due observance of your contract.

I am, &c.,

J. BARLING,

Under Secretary.

Is not that virtually an acceptance of a certain amount of work, limited to the distance between Munni-street and Shea's Creek, for the sum of £20,650? It is not. No such sum is referred to in the letter.

15713. But is not that the total sum of the contract? No. There is no total sum in existence, except for the purposes of estimate.

15714. Was not a schedule of tenders submitted to the Engineer-in-Chief on 18th February, 1891, containing this information:—"No. of tenders received, 12; amount of lowest tender, £20,650; name of lowest tenderer, Carter & Co." Then follow a list of the tenders, and finally there is this minute by Mr. Hickson:—"I recommend acceptance of Carter & Co.'s tender at schedule rates"? That is so. It distinctly states that the tender is accepted at schedule rates, and not at what you seem to think, namely, a sum of £20,650. That sum exists, as I said before, simply for the purposes of estimate and comparison.

15715. *His Honor.*] For the purpose, I understand, of determining who is to get the contract? Exactly—for a comparison of tenders.

15716. *Mr. Parkes.*] I will ask you now to read some correspondence which took place in relation to this contract—for instance, there is a letter signed by Mr. Hickson, and dated 13th October, 1891, informing the contractors that the work is to terminate at the foot of Macdonald-street? Yes, that is so.

15717. Will you now read this minute of the 23rd October, 1891? Yes; it is as follows:—

Two sums of £15,500 and £8,500 were voted for a storm-water sewer in Macdonaldtown, and the subsequent continuation of same to Shea's Creek.

To complete same, two amounts of £18,764 and £6,500 will be required, leaving a deficiency of £1,264.

It is absolutely necessary that these two works should be joined, otherwise neither of them would be of any use.

Pending, therefore, another Loan Vote, it is requested that this amount be made available from the Treasurer's Advance Account next year.

A further extension of Contract No. 72 was contemplated when tenders were invited, amounting to about £7,000.

This work is also very necessary, and to cut it out of the contract now (though, perhaps, strictly speaking, we have the power) would be very unfair to the contractors, as it is by far the easiest portion of their work, and one which they expected to make some money upon, and, in fact, pick up the losses which they have made on the heavier portion of the contract.

The contractors have approached me in connection with this matter, and I am of opinion if the £7,000 cannot be granted they will in equity have a claim on the Department.

For the Commissioner,

E. A. NARDIN.

Under Sec.

It is signed for the Commissioner by Mr. Nardin. He may be a very good officer as a Roads officer, but he certainly knew little or nothing about sewerage matters; and I do not know how he came to sign that letter.

15718. I will now ask you to read this minute of Mr. Hickson's, dated February 5th, 1892. It is as follows:—

TENDERS were opened in February, 1891, for sewer from B to E, the lowest being that of Messrs. Carter & Co. for £20,650 (at per schedule rates).

This tender was accepted on the understanding that the cost of the work be reduced so as to bring the cost of the work within the amount allowed without reference to the Public Works Committee.

At the commencement of the contract the sum of £15,500 was available, and this was proposed to be expended on the work between the Mitchell Road and Munni-street (C to E on sketch), a clause allowing a reduction of the work, A to C, being inserted in the specification.

On starting the work, however, it was found that there was no outlet to the sewer at Mitchell Road at C, and a channel had to be cut along the proposed course of Shea's Creek Canal (A to B), at a cost of £4,000, to provide an outlet, and the sewer continued from Mitchell Road (C) to the commencement of the outlet channel (B), at a cost of £8,000.

This unavoidable construction of the sewer in the first instance, from A to D, exhausted the funds, and that portion of the work from the Macdonaldtown Park junction at D to the point of commencement at Munni-street (E), which formed part of the original contract, has had to be omitted for the present.

ROBT. HICKSON.

15719. That minute contains a sketch? Yes, explanatory of the minute.

15720.

15720. *His Honor.*] Does not it show that the starting point of the original contract was point B in the sketch? No; the earth channel extends for about 50 chains down the centre of the Shea's Creek canal, which is also shown on the contract drawing, and which is, therefore, comprised in the contract. At the same time the quantities of the earth channel were not comprised in the sum of £20,650.

J. Davis.  
4 Sept., 1896.

15721. But can the earth channel be called a storm-water sewer in any sense? No; it was a temporary channel cut in anticipation of the canal.

15722. The contract is for the construction of a storm-water sewer from Munni-street to Shea's Creek? I am afraid that we had not used the word "sewer" or "channel" quite in the way in which you use it. As you will observe upon drawing No. 1, instead of sewer the word "channel" is used. The earth channel would certainly be covered by that. Mr. Barling, in writing his letter, seems to have used the word "sewer" instead of the word "channel."

15723. Where would you say that Shea's Creek began? I could not answer the question as to where Shea's Creek would be originally; at the termination of the contract there was no creek. It would be down near Ricketty-street. I am inclined to think that the term "Shea's Creek" has been used in a more or less vague and indefinite way. The idea was to get an outlet for the Munni-street storm-water channel, and it was considered to be Shea's Creek.

15724. *Mr. Parkes.*] Upon page 141 of the Parliamentary Return you will find a paragraph as to the extent of the contract? Yes; it is as follows:—

2. The works comprised in this contract consist in the necessary excavation, shoring, timbering, piling, unwatering, concrete, brickwork, stonework, rendering, refilling, pipe-laying, carpenter's work, ironwork, pitching, paving, ballasting, metalling, leading surplus materials to spoil, &c., required in the construction of the following, viz. :—

|                      |              |              |   |
|----------------------|--------------|--------------|---|
| From Shea's Creek to | 20 chains    | open channel | 11 ft. 6 in. x 7 ft. 6 in.  |
| "                    | 20 chains to | 28 "         | oval sewer 10 ft. 6 in. x 6 ft. 6 in.   |
| "                    | 28 "         | to 39·12 "   | " 10 ft. 6 in. x 6 ft.  |
| "                    | 39·12 "      | to 39·77 "   | junction of two creeks, with flat concrete decking between wrought-iron rolled girders. |
| "                    | 39·70 "      | to 48·17 "   | oval sewer 7 ft. 2 in. x 6 ft.  |
| "                    | 48·17 "      | to 58 "      | circular sewer of 6 ft. internal diameter.  |
| "                    | 58 "         | to 62·50 "   | " of 5 ft. 10 in. internal diameter.  |
| "                    | 62·50 "      | to 66 "      | " of 5 ft. 2 in. internal diameter.   |
| "                    | 66 "         | to 72 "      | " of 3 ft. internal diameter.   |
| "                    | 72 "         | to 76·58 "   | " of 2 ft. 6 in. internal diameter.   |

15725. Do not those dimensions correspond with the plan? As far as they go, but they do not include the lower portion that I have referred to. The paragraph goes on to say, "And all other works in connection with those herein enumerated."

15726. Where do you find that? Lower down in the same clause, so that although the channel is not enumerated it is at the same time comprised.

15727. Does not that denote the extent of the contract? Generally, yes; but it does not include the lower portion.

15728. Will you read this paper, dated 3rd October, 1891? Yes; it is as follows:—

THE amount of tender for Contract No. 72 was £20,650, but it was accepted conditionally upon the contract being reduced by £3,000.

It is advisable that Contract No. 72 should be continued so as to give an outlet to Contract No. 75.]

|   |         |    |    |
|---|---------|----|----|
| The cost of doing this will be .....          | £18,764 | 4  | 10 |
| Deduct amount paid to date.....               | 9,680   | 13 | 9  |
| Amount required to finish to Contract 75..... | 9,087   | 11 | 1  |
| Amount available from vote.....               | 5,754   | 0  | 0  |
| Balance to be provided .....                  | £3,333  | 11 | 1  |

I beg to suggest that this amount be paid from the following votes, viz. :—

|  |        |   |   |
|--|--------|---|---|
| (1.) There will probably be a balance of £2,000 from the Macdonaldtown Storm-water Channel Vote, after that channel has been paid for, which might be used for Contract No. 72, which is part and parcel of the same work..... | £2,000 | 0 | 0 |
| (2.) The following amounts, being balances left from votes from the undermentioned storm-water channels, might also be used for this purpose :—  |        |   |   |
| University storm-water channel .....   | 131    | 0 | 0 |
| Phillip-street, Alexandria, storm-water channel .....  | 815    | 0 | 0 |
| Pymont Bridge Road, storm-water channel .....  | 265    | 0 | 0 |
| Alexandria Park, storm-water channel .....   | 57     | 0 | 0 |

Mr. Bagge.

£3,268 0 0

(Signed) J. DAVIS.

That is supposed to be a copy of a minute of mine.

15729. It is your minute, is it not? It is a copy of it.

15730. Is it not signed by you? No; it is supposed to be a copy of my minute.

15731. It is your production? It is supposed to be a copy of it.

15732. *His Honor.*] But the original is your production? Yes. I say that this purports to be a copy of my original minute.

15733. In whose writing is it? In the writing of a man named Young.

15734. *Mr. Parkes.*] Was he not your clerk? Yes.

15735. *His Honor.*] For what purpose has this copy been made? I have no idea.

15736. *Mr. Parkes.*] Where would the original be? I do not know even that.

15737. *His Honor.*] Do I understand that the signature and everything is a copy, and that the document is not actually initialled by you? The document attached to it is initialled by me. It is a copy of the completed work upon Contract 72. The paper itself simply purports to be a copy of my minute.

15738. *Mr. Parkes.*] Is there any minute attached to it? There is a little minute by Mr. Hungerford, under date of 21st November, 1891. He says:—"91-2,424. Not returned from Works Department." I do not know what that refers to at all.

15739.

J. Davis. 15739. Does not that document show that you limited the contract in order to keep it from the clutches of the Public Works Committee? I do not think I mentioned the Public Works Committee.

4 Sept., 1896. 15740. Do you not mention that it is reduced? The amount of the tender for Contract 72 was £20,650, and that amount was reduced by £3,009.

15741. But was it not reduced so that it would not go before the Public Works Committee? I cannot tell you that.

15742. Will you read this minute, under date of October 28th, 1891? Yes; it as follows:—

On the Loan Estimates for 1890 the following votes were taken:—

Macdonaldtown Park Stormwater Sewer, from Swanson-street to Ashmore-street; thence from Ashmore-street to Macdonald-street—£8,500.

Stormwater Channel from Munni-street, Newtown, through Macdonaldtown Park to Shea's Creek—£15,500.

The work comprised in the first item is shown on the accompanying plan marked "A" to "B." It is being carried out by Messrs. Parry and Farley, and is nearly completed. The cost will be about £6,500, leaving a balance on the vote of about £2,000.

The work comprised in the second item is now being carried out by Carter & Co. Its position is shown on plan starting from point "C," and it is intended to terminate at "E," supposing sufficient funds are at disposal for the purpose, the contract being a schedule one. It was found during the progress of this work that an earthen drain was required from point "C" to "F" on plan, running along the course of Shea's Creek Canal. This work was one which it was first understood would be carried out by the Harbours and Rivers Branch in connection with the canal works, but it was subsequently decided to include the work in the Roads Branch Contract. This earthen drain will absorb £4,000 of the money, leaving a deficiency on the vote of something like £9,000. The contract of Messrs. Parry and Farley has been shown as terminating at point "B" on plan, and a small gap has been left between "B" and "D," which it is estimated will cost £1,264 to complete. This can be paid for out of the balance available on the £8,500 vote. It will be seen, therefore, that a further sum of £9,000 will be required to complete the whole of the work from "E" to "F." Of this sum £4,000 is required on account of the earthen drain referred to, and which was not contemplated when the work was undertaken, and the balance, £5,000, is required to complete the work up to "E." In other words, the £9,000 represents "extras," not contemplated when the contract was let.

It is represented that the matter is so urgent that the Minister is asked whether special arrangements cannot be made to permit of this work being proceeded with, in anticipation of further funds being voted. None of the additional sum will be required until next year. This further amount will bring the cost of the Munni-street sewer to about £25,000. (Vide Appendix J.)

J. B.

15743. That is accompanied by a plan? Yes.

15744. What are the minutes upon the paper? There is this minute: "The tender of Carter & Co. at their schedule prices originally amounted to £20,657; but as that exceeded the limit of £20,000 provided by the Public Works Act it was decided to reduce the work to the extent of £3,000." Then there is this minute: "Resubmit as soon as Estimates are passed."

15745. Does not that clearly indicate that the contract was within certain limits, and that there was a certain amount of extras upon it? At the time the contract was accepted Mr. Bruce Smith stipulated that when the work was finished it was not to exceed £17,000.

15746. Did you tell Mr. Bruce Smith that you were taking funds from votes for other contracts to pay for the extension of this work? I did not; and no money was so taken.

15747. What is the meaning of that minute of yours indicating where the money was to come from? It was written in good faith. It was my idea, but it was never acted upon.

15748. Where did the money come from which made up the vouchers which were paid prior to April, 1892, making a sum of £17,000? The amount was available, as far as I can remember, from the original vote.

15749. But the original vote was £15,500? Yes.

15750. Upon April 2nd a Loan Bill freed another £9,000 referred to in your minute? Yes.

15751. Where did the money come from which was paid in January and February, 1892, to make up the £17,000 represented by the vouchers? You say it was paid, but I should have to look up the vouchers myself before I could say.

15752. For instance, on 3rd March, 1892, a payment was made, making a total payment of £16,381—is not that so? No.

15753. Then will you explain it? From that amount of £16,381, there are overtime penalties deducted.

15754. For how much? £240.

15755. But the balance exceeds the £15,500, does it not? It exceeds the £15,500 by about £600.

15756. Where did the excess money come from? It must have come from somewhere. I think I can explain it. The £600 would be taken probably from the Macdonaldtown Park sewer vote, inasmuch as portion of the Munni-street work would be part of the Macdonaldtown Park work. The junction and a portion of the sewer at the foot of Macdonald-street is really part of the Macdonaldtown Park sewer. For that reason I have no doubt that a portion of the money would be taken from the Macdonaldtown Park sewer vote. I think if you refer to the head of that voucher you will see that the excess money was taken from the vote of £8,500 for the stormwater channel at Macdonaldtown Park.

15757. The voucher I now hand you shows a total of £18,605 of the work performed, does it not. Yes.

15758. That exceeds the contract amount, does it not? No.

15759. Not the original contract amount? No.

15760. How is that? Because, as I already explained, there is no contract amount.

15761. There is no finality at all to the matter? There is no contract amount.

15762. But there must be some finality to the contract? It is reasonable to suppose that there would be.

15763. The amount of £18,605 would have to be paid? I presume it was paid eventually.

15764. The contract was going on in January and February, was it not? You asked me about that on Wednesday, and I think I then answered your questions pretty fully.

15765. The contract was going on in those months? I said on Wednesday what I say now—that in October a letter was sent to the contractors that they were to terminate the work up to the foot of Macdonald-street. They had to finish the work up to that point before they stopped.

15766. Will you read your minute of November 14th, 1892? Yes; it is as follows:—

WHEN this contract was finished from Shea's Creek to the foot of Macdonald-street the contractors were informed, in accordance with the terms of the contract, that they were not to proceed beyond that point. Afterwards a further sum of £9,000 was voted, and the Minister decided to allow Messrs. Carter & Co. to complete the contract to Munni-street, and they were given until the 18th August (four months) to do this. The contractors have lost no time since they received instructions to proceed with the work, and I am therefore of opinion that the four months was scarcely sufficient time to do the work in.

The contract was finished on 22nd September, or five weeks overtime, and the contractors have therefore been fined five weeks at £20 = £100, which sum they now ask should be remitted, and for the reason stated above I beg to recommend that their request should be granted.

J. D.

Mr. Bagge.

15767.

Mr. Hickson wrote this minute on the same date:—"I recommend that the fines be remitted. The time given (four months) was too short." Mr. M'Lachlan says "list," and then the matter is approved by the Minister, Mr. Lyne, on 19th November, 1892, and Carter & Co. were informed. 15767. Will you now read the letter of the Council Clerk of the Municipality of Macdonaldtown, dated February 24th, 1892, to the Under Secretary for Public Works? Yes; it is as follows:—

J. Davis.  
4 Sept., 1896

I have the honour, by direction of the Mayor, to ask you to be good enough to inform me if the Hon. the Minister for Works will be pleased to receive a deputation from this Council on the subject of the stoppage of the construction of the storm-water sewer along M'Donald-street to Munni-street.

Trusting that the Council's application will be favourably received.

I have, &c.,  
WILLIAM F. BRAY,  
Council Clerk.

Mr. Barling wrote upon that this minute "May perhaps be informed that there is no need for a deputation, and that as soon as the additional money required is voted the work will be proceeded with." That was approved by Mr. Lyne on 5th March, 1892.

15768. Mr. Baggé wrote a minute on 21st November, 1891, which I will ask you to read? Yes; it is as follows:—

These three letters, 91/2,793, 91/2,802, and 91/2,816, all refer to the same subject, namely, the extension of the Shea's Creek storm-water channel from the Macdonaldtown Park branch channel, along Macdonald-street to Munni-street.

I quite agree with the writers that the work is most important, and the question of constructing this extension is now before the Minister [see papers, 91/2,424] for the purpose of procuring funds.

C. H. OHLFSEN-BAGGE.

15769. Will you read the following minute by Mr. Hickson under date of April 5th, 1892? Yes; it is as follows:—

Now that the necessary funds (£9,000) are voted for this work, I should be glad to have authority to continue the sewer, which was stopped some months ago for lack of funds. The contractors have kept some of their plant and a lot of material on the ground, there is nothing therefore to prevent the work, which is much needed, being gone on with at once and thus provide employment for a considerable number of men.

ROBT. HICKSON.

Mr. Barling says upon that "Some agreement as to time should be made, I think." That is approved by Mr. Lyne on 6th April, 1892.

15770. Here is a minute by Mr. Weedon which I should like you to read. It is dated 31st December, 1892? Yes; it is as follows:—

I have the honour to forward to you herewith a statement of Contract No. 72, giving the original contract amount, and also the final amount for the completed work. The difference between the amounts shows that the cost of the work exceeded the original contract; this was occasioned by extra works that had to be undertaken, which were not contemplated when the contract was let [see Minute Papers 91/2819—21.11, 28th October, 1891, and 5th February, 1892], the most important of which were—first, the cutting of an open outlet (of over half a mile in length) from the termination of the concrete channel to the canal in Shea's Creek; secondly, covering the open concrete channel with jack arches where it passed through the sand-hill near the outlet. An extra grant of £9,000 was made to meet the above.

Yours, &c.,  
STEPHEN H. WEEDON,  
Resident Engineer.

Attached to that is a statement of the final quantities.

15771. Are there any minutes on that? Yes; there is a minute by myself, "Forwarded with final certificate." That is dated 31st December, 1892. Mr. Hickson says "Seen" on 3rd January, 1893.

15772. Will you read the following minute under date 13th March, 1891? Yes; it is as follows:—

It has just come to my knowledge that in carrying out the works of the the Munni-street to Shea's Creek Sewer, a part of which is along the centre line of the proposed Shea's Creek Canal, and is itself an open channel, the material from the open channel is being disposed in such a position as in the event of the Shea's Creek Canal being extended to Buckland-street the whole of their material will have again to be moved: it may be possible that this material can be so disposed as to make one moving sufficient: I would suggest that the Engineer-in-Chief for Roads and Bridges' attention be drawn to the matter.

GEO. TILLET,  
For Engineer-in-Chief.

That is addressed to the Engineer-in-Chief. Whether it was sent on to him or not I do not know.

15773. In connection with that sewer, the contractors received 2s. 6d. a yard for excavation, did they not? Yes.

15774. Is not the excavation entirely through sand? No.

15775. What is the excavation at that end of the canal? It is soft excavation; not sand.

15776. What is it composed of—shale? No; it is soft excavation.

15777. Is it not sand? No.

15778. Is it not the same as the bed of Shea's Creek? What part of Shea's Creek do you speak of?

15779. Is it not the same kind of ground that you will see at the excavation in the bed of the Shea's Creek canal? The upper portion of the ship canal will be the same as that channel, but not the lower portion. The lower portion of the ship canal is in sand.

15780. Mr. Tillet in writing that minute says that the contractors are depositing their spoil within 25 feet of the channel, and that that would be in the way of the ship canal excavation—I want to know whether the contractors were paid the shilling in addition for filling, for putting that spoil along the bank? No. I think you will find some minutes of mine in connection with the same thing. I wrote the following minute, dated 16th March, 1891:—

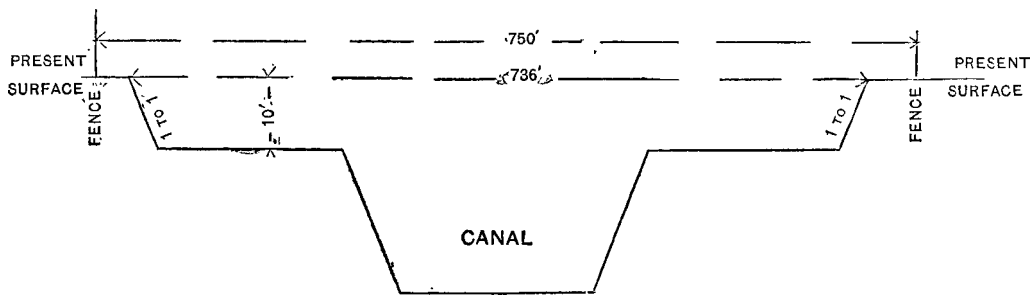
Before this work was commenced last week I saw the importance of not only cutting our channel in such a way that ultimately it would form part of the proposed canal, but also that the earth excavated should be so deposited that it would not have to be moved a second time. I therefore asked Mr. Boys to see Messrs. Tillet and Williams of the Harbours and Rivers, and ascertain from them what distance from the side of the canal they would require the excavated material deposited, so as to be clear of their work.

Mr. Boys understood that if we kept 25 feet outside of the edge of the canal there would be sufficient room for the canal banks. I gave our contractors orders accordingly.

Since

J. Davis  
4 Sept., 1896.

Since receiving Mr. Tillett's minute I have seen him, and he informs me that there will probably be an excavation 736 feet wide, thus:—



at the point where our storm-water channel joins the line of canal.

The ground is of such a soft nature that I do not think it practicable to move our excavated material clear of the 750 feet proposed canal resumption, except at great expense, and as it does not appear that the cross section of the excavation for the canal is definitely settled, I recommend that our contractors be allowed to go on depositing the earth parallel with the canal, leaving 25 feet from the edge of the canal for the future bank.

J. DAVIS.

That is addressed to Mr. Bagge. He sends it on to the Engineer-in-Chief, who says, "I should be glad if Mr. Tillett would see me about this." There is then another minute by Mr. Hickson, "Arrangements made with Mr. Tillett as to the disposal of this material." I am then asked to note that, and I initial it.

15781. Did the shilling a yard apply to that? I have already said that it did not.

15782. In the final payment upon Contract 72 there is an increase on filling; what do you call filling, to begin with? The specification would define that.

15783. But I want you to define it? I should have to go to the specification.

15784. Can you not define it, speaking from your experience as an engineer? My experience as an engineer teaches me that I should not go outside the two covers of the specification.

15785. Do you not go outside the two covers of the specification? I endeavour never to do so.

15786. Have you never done so? I cannot say that I have never done anything wrong, but the proper thing to do is to administer the specification. It is put into our hands to administer, and in regard to this matter of filling you must take what the specification says in regard to it.

15787. Has your evidence before the Commission been that you have stuck absolutely to your specifications? Yes.

15788. Has that been the effect of your former evidence? Yes.

15789. What is the filling in this case? You will find the definition of refilling in clause 55, upon page 145, of the Parliamentary return. Clause 60 gives what is comprised in the price for one cubic yard of filling.

15790. Did the contractors receive 1s. a yard for filling for putting the spoil 25 feet from the bank? No.

15791. What became of the spoil of the canal? It was put as the minute that I have just read—the minute of the 16th March—indicates.

15792. Where was it put? As that minute indicates.

15793. What does the minute say? I think 25ft. from the edge of the proposed canal.

15794. And did the Harbours and Rivers Branch remove it again? I do not know what happened afterwards.

15795. The Harbours and Rivers Branch excavated the ground where it was deposited? I do not think so, I believe that after we had drained the swamp a period elapsed before the ship's canal was brought up to that point. I suppose a couple of years elapsed. The swamp being drained Chinamen started to cultivate upon the soil we had put there—in fact, they had some nice gardens there, and it was not until the ship canal was put into operation that the gardens were abandoned.

15796. Do you call that the losing end of a contract where the contractors were receiving 2s. 6d. for excavating soft material, and where they deposited it at 1s. a yard? It was a very nasty end of the contract.

15797. But do you call that the losing end? I should say it was a very nasty, and, therefore, an expensive end. It was simply a swamp.

15798. But the material was not difficult to remove? It was most difficult to remove.

15799. *His Honor.*] It was soft to excavate? If you could get it into the barrow. They had to use planks to stand upon; it was a very nasty place.

15800. You mean that it was in a state of sludge? Yes; I tried to go across myself, and I know that if you put your feet off the reeds you did not know where you were going to.

15801. In dry ground what would be a fair price for excavating the same sort of stuff? I suppose that if it were dry a shilling a yard would cover it pretty well.

15802. That would be a good price, would it not? I do not know that it could be done for much less if you take plant and profit into consideration.

15803. But excavation for large tanks has gone down to 6d. and 9d. in soft ground? Yes; we are getting excavation done for 7d. now, but you have to take everything into consideration.

15804. *Mr. Parkes.*] Will you read your minute of 23rd May, 1891? Yes; it is as follows:—

The ground between the outlet and 4 chains is so bad that it will be necessary to strengthen the concrete for this length. I propose to put in an additional 12 inches of sandstone concrete, and under this 12 inches of quarry refuse, as shown on the attached sketch.

The extra cost will be as follows:—

|   | £   | s. | d. |
|---|-----|----|----|
| Sandstone concrete, 145 cubic yards, at 34s.....    | 246 | 10 | 0  |
| Excavation, 290 cubic yards, at 2s. 6d. ....        | 36  | 5  | 0  |
| Quarry refuse, filling 145 cubic yards, at 1s. .... | 7   | 5  | 0  |

Total ..... 290 0 0

J. DAVIS.

Mr.

Mr. Bagge wrote upon that the following:—"I beg to recommend Mr. Davis's proposition to Engineer-in-Chief's favourable consideration. Mr. Davis intends to have the layer of quarry refuse well rammed, and the concrete up to invert in specified layer of long lengths finished before the sides are built, so that all may settle gradually." Mr. Hickson approved, and Carter & Co. were informed.

J. Davis.

Sept., 1896.

15805. Mr. Weedon wrote a letter concerning some filling in the canal. He says, "The total quantity of excavation by the cross-sections, allowing an average area of 6'32 square feet between 33'50 and 38'28 chains?" Mr. Weedon referred there not to the canal but to the earth-channel which was cut on the site of the proposed canal, and the chainages referred to are those measured from below M'Namara's dam upwards, taking the point below M'Namara's dam as being 0.

15805½. *His Honor.*] What do the three close parallel lines on the tracing represent? They are drains.

15806. *Mr. Parkes.*] In one of your memoranda you referred to clause 4;—will you read the 5th section of that clause, which appears upon page 152 of the Parliamentary Return? Yes; it is as follows:—

The Minister, or the Engineer, acting on his behalf, may, from time to time, by writing under his hand, require the omission of any particular portion or part of the works described in the specification or shown on drawings; and the contractor shall have no claim for loss of profit, sustained damage, or other compensation on account of any such omission.

But I referred to section 4.

15807. Will you read the special clause 3 which appears upon page 141 of the Parliamentary Return? Yes;—it is as follows:—

3. It is to be understood that the lower 13 or 27 chains of the channel shall not be constructed until the Engineer gives a written order to that effect; and the Engineer shall have the power to suspend the execution of these portions of the work, or any other part of the contract, or to reduce the length of the contract by the extent of the said 13 or 27 chains, or any other part of the sewer shown on the drawings, that he may consider necessary, and the contract shall not thereby be invalidated, nor shall the contractor be entitled to any compensation on account of such temporary suspension of any part or parts of the contract or permanent reduction of same.

15808. You say that that clause is simply a repetition of clause 4;—how do you make that out? It is, with the exception of a special part of it, referring to the 13 and 27 chains.

15809. Can there be any chance of a man signing that contract having any claim? There would be no chance whatever if the clause were put into operation with regard to the 13 and 27 chains. Then, with regard to the general clause, it would be a question as to how far it would be equitably operative.

15810. But if you were a private individual, and had made special provision for cutting your coat according to your cloth, as it were, and a man made a demand upon you in violation of such a clause as that which you have read, what would you have considered—would you think he ought to be paid? As I said before, it is just a question as to how far that clause should be availed of—to what extent. But, at the same time, if it is in reference to the upper portion of the channel, I say at once that it does not come into the question.

15811. Why? Because that portion of the channel was constructed by Carter & Co. It was not omitted. At the time the letter was written it was intended to omit it altogether. We did not know whether the Minister would sanction any more moneys being voted, and it was intended to omit that portion, but virtually in the end it amounted not to an omission, but to a suspension of the work.

15812. Was there any doubt at all but that the contract would go on? I think the papers you have asked me to read show pretty clearly what the intention of the Department was.

15813. No doubt they do, and it was that Carter & Co. should continue the contract? That when money was available the contract was to be continued; but you will find no such statement as that until a certain date, when the Minister virtually approved of £9,000 being put upon the Estimates. It was then decided to complete the contract.

15814. In the meantime the portion they had in hand was being constructed? The portion to which you refer was omitted in the first instance, but when money was likely to be available it resolved itself into a suspension, so that, whether the clause of which you are speaking applied or not, it refers only to the first part of the transaction, and not to the second—suspension being a totally different matter.

15815. As a matter of fact, you gave the contractors extra work which would make up for the piece of canal that ran down Shea's Creek? No. I do not say that we did. In the correspondence it may have been put in that way for convenience sake, but at the same time it could not be regarded as an extra. It was all embodied in the work.

15816. When the officers of the Department were making arrangements for that extra work, why could they not have made definite arrangements if they anticipated that there was going to be any claim for the cutting off of work? I do not admit that there was any extra work.

15817. In your memorandum, No. 4, you say, "When Mr. Lyne wrote his minute of 23/2/92, in which he stated after having seen Mr. Hickson that Carter & Co. would in all probability be able to make a claim, &c."? You must bear in mind that that is not an extract.

15818. But it has the intent of an extract, and it is not an absolutely correct statement? You will see what Mr. Lyne said if you refer to the minute.

15819. Mr. Lyne says, "As Mr. Hickson thinks Messrs. Carter & Co. could make good a claim for something like £2,000 as compensation on Contract 72, &c.," but you say in your memorandum that Mr. Lyne stated that Carter & Co. would in all probability be able to make good a claim;—he does not say that in his minute? I confess that I do not see much difference. They are different words, certainly, but the meaning, as far as I can see, is precisely the same. I think I have fairly represented what Mr. Lyne said.

15820. Except that you throw the responsibility on to Mr. Lyne. You heard his evidence, and you heard him say that if Mr. Hickson had not told him that the claim was a valid one, he would not have let Carter & Co. have the contract? I do not think he said that.

15821. He said, I think, that he acted in the matter entirely upon the recommendation of his officers? He said, as far as I can remember, that he might or might not have seen the claim, but that before he wrote his minute he was perfectly satisfied on the point.

15822. Let me refer you to Mr. Lyne's answer to question 9180. He there says that the chances are that the claim was put before him, and that he should have imagined that he obtained particulars of the claim. At all events he must have been satisfied that Mr. Hickson had had particulars of the claim before him. It would seem from that answer that Mr. Lyne was not the originator of the acceptance of the tender? I take Mr. Lyne to mean that, after seeing Mr. Hickson, he wrote a certain thing—that he did not write it apart from Mr. Hickson.



- J. Davis.  
4 Sept., 1896.
15823. Would it not have been better for you to quote the Minister's minute? These minutes are quoted so frequently that it seems almost superfluous to quote them again and again when there is not absolute necessity to do so.
15824. You say also in your memorandum No. 4:—"A similar case to this occurred on the sewerage works at Bondi, contractors, A. J. Smyth & Co., in 1884? The works were stopped on account of the representatives of the Cooper family having obtained an injunction, and although they were only suspended for a period of about two months the contractors were paid on the advice of the Crown Solicitor the sum of £3,000 as compensation."
15825. Upon that particular contract, was there any anticipation before it started of the stopping of any part of it? I do not see what that has to do with it.
15826. *His Honor.*] But was there in point of fact? I think the case speaks for itself.
15827. *Mr. Parkes.*] What I want to know is whether there was any idea of stopping the works when they were first commenced; are the cases at all similar in that respect? They are two cases of suspension of work from different causes. They are dissimilar as far as the reason of suspension is concerned, but not otherwise.
15828. In the case of the contract at Bondi the works were stopped during the course of construction by another party taking action—is not that so? They were stopped by the Supreme Court.
15829. And in the other case the works were stopped because there were not sufficient funds? Yes.
15830. Which was known when the contract started? I do not quite know how to answer that. It was known—if you mean that—that we had not more than £15,500 and £8,500 for that particular work.
15831. And you made provision that the contract should not exceed that amount? We made provision for the reduction of the £20,650 by £3,000. I have already explained with regard to the upper portion of the work that it was perfectly proper and justifiable to take a portion of the vote of £8,500 for the Macdonaldtown Park sewer.
15832. From another contract—from Parry and Farley's? Parry and Farley's contract was paid from the vote of £8,500, and part of Carter & Co.'s contract was also paid from that vote.
15833. Will you now turn to your memorandum No. 6, dealing with the substitution of blasting for guttering and gadding upon Contract 79. Will you explain the figures by which you show that a saving is made? You say, "On these conditions the Engineer-in-Chief approved of the excavation being done by blasting, and the work was carried out accordingly, and in the final voucher the concrete which was included was reduced equal to £1,302 9s. 8d." I do not quite know what explanation you require beyond that statement. If you will indicate what explanation you require I shall be glad to make it.
15834. Will you explain where a reduction equal to £1,302 9s. 8d. comes in? The actual sandstone packing carried out at schedule rates amounted to £1,495 13s. 9d., and the sandstone packing paid for amounted to £790 3s. 3d. The difference between what was actually carried out and what was actually paid for represents a sum of £705 10s. 6d. Then, as regards bluestone concrete in the sewer actually carried out at schedule rates, the amount was £4,012 18s. 1d., whereas the bluestone concrete in the sewer actually paid for amounted to £3,415 18s. 11d., or a difference of £596 19s. 2d. If you add that to the amount of £705 10s. 6d. you get the total of £1,302 9s. 8d.
15835. Will you explain in detail how you make up these items? Do you mean how we arrived at the quantities stated in this summary?
15836. Yes, taking the schedule of the contract? First of all, when the tunnel was driven before the lining was put in, cross-sections were taken of the excavation, and they indicated that in the case of sandstone packing there would be required 797·70 cubic yards, and in the case of the bluestone concrete 1,433·18 cubic yards. But, in accordance with the Engineer-in-Chief's decision, only 421 cubic yards in the case of the sandstone packing, and only 1,219 yards in the case of the bluestone concrete, were paid for. The difference makes up the amount of £1,302 9s. 8d.
15837. These quantities are in excess of the items as shown on the final voucher? The £1,302 9s. 8d. is not included in the final voucher.
15838. Therefore, if the final voucher has 1,872 yards of sandstone concrete the contractors were paid an excess amount? That is correct.
15839. The 421 cubic yards of sandstone packing was paid for in excess of the contract, was it not? No.
15840. Then why do you say that the sandstone packing actually paid for was 421 cubic yards? It was paid for in conformity with the contract.
15841. But in excess of the 1,872 cubic yards? It is included in that.
15842. Is it not an extra over and above the amount anticipated in the contract? I do not follow your question.
15843. The sandstone concrete in the schedule prepared by the Government was given as 1,020 yards, was it not? Yes.
15844. And it was finally paid for with an increase of 850 yards? The final voucher included 1,872 cubic yards.
15845. Therefore there was an extra upon the sandstone packing, between the estimated amount and the actual payment, of 850 yards? Yes.
15846. Upon what is your calculation based when you say that there is a difference of only 376 cubic yards? I say there is a difference of 376 cubic yards between the sandstone packing actually put into the sewer and the sandstone packing actually paid for.
15847. Will you produce, for the perusal of the Commission, the detailed figures upon which you worked out this return? Yes.
15848. I will also ask you to produce the details of your calculation on the value of the Monier work in Contract 77? I can produce the figures in both cases if necessary, but I can explain how I arrived at the results in cross-examination.
15849. Will you put the figures in tabulated form? I can do so if His Honor thinks it necessary.

MONDAY, 7 SEPTEMBER, 1896.

Joseph Davis recalled and further examined:—

15850. *His Honor.*] You desire to make a statement? Yes; before Mr. Parkes resumes his cross-examination I should like to refer to one matter of which I spoke on Friday last, with reference to the placing of plans upon the Table of the House. I was asked by Mr. Parkes this question:—"Supposing the contract plans were kept back?" I said in reply that they were not regarded as being asked for. I find, on reference to *Hansard*, that Mr. Young, the Minister, thought precisely as we did in the office, because, speaking in reply to Mr. Parkes in the House, he said "As a matter of fact, the honorable member did not move for plans at all."

J. Davis.  
7 Sept., 1896.

15851. *Mr. Parkes.*] I presume he received that information from the office;—I presume he referred to you in the matter? I did not give him any information, and I do not think anyone else did. I think Mr. Young's statement was the result of his own reasoning in the matter.

15852. In connection with Contract 69, you say, in your memorandum No. 1, "It was known when the tenders were accepted that there would be three descriptions of ground through which the tunnels and shafts would pass, viz., soft ground requiring timber, shale, and hard rock." Further down you say "It is not difficult, therefore, to see why in this particular instance (Contract 69) the tunnel excavation should have been so materially increased compared with the quantities given in the schedule. It was thought, when the contract drawings were prepared, that the tunnel in more or less hard ground would have been in hard shale, whereas it proved to be ground requiring timber, and as a consequence the quantities given in the schedule for this kind of work proved to be much below what was expected;"—but you must have anticipated the nature of the ground? We anticipated that it would be shale. The borings showed that.

15853. This contract was let on what date? The contract was signed on 22nd January, 1894, but the date of the letter of acceptance is 27th December, 1893.

15854. On the 18th January, 1894, you wrote a letter fixing the cross-sections, did you not? Yes; as far as they could be fixed at that date.

15855. But are they not the cross-sections on which the contract was actually carried out? They were fixed at that date. They may have been modified slightly after that. Generally speaking, no doubt those are the sections.

15856. Your measurements there are to the inside of the timber, are they not? It does not say in the letter, as far as I can see.

15857. The drawing I hand you, No. 32, is the plan upon which the work was actually paid? It is supposed to show the work as actually paid for; but I observe that there is only one polling-board shown on the plan. The polling-boards overlap each other. Whether that was taken into consideration in plotting these sections or not, I do not know.

15858. Take your letter of 18th January, 1894, which appears in the Parliamentary return—what is the largest section given in that communication? The section of the sewer, 6 ft. 8 in. x 5 ft. 8 in.

15859. That corresponds with the section of the 6 ft. 8 in. by 5 ft. 8 in. sewer shown upon this drawing, does it not? Yes.

15860. What is the size of the next section? Five feet 2 in. by 4 ft. 2 in.

15861. Does that correspond with the drawing? Yes.

15862. What is the next? Five feet 1 in. by 4 ft. 1 in.

15863. Does that correspond with the plan? It corresponds with it as far as the internal measurement of the sewer is concerned.

15864. That is the plan upon which the contract was measured and paid? I do not say that.

15865. You said so in your former evidence;—you produced this as the plan upon which the contract was paid? I said that this plan was supposed to correspond with the measurements, but that, as I had not compared them, I was not in a position to say whether that was so or not.

15866. Did you not say that this was the plan upon which the contract was paid? No, I did not. What I said then I say now.

15867. *His Honor.*] What is the date of the making of that plan? It is dated 6th December, 1895.

15868. *Mr. Parkes.*] This plan was made after the contract was completed? It was finished after the contract was completed.

15869. The measurements correspond with those which were given when the contract commenced? The measurements contained in my letter of 18th January, 1894, are those sent to the contractors for their guidance; but they were subject, and necessarily so, to alteration during the progress of the work.

15870. To make these cross-sections you must have anticipated the kind of ground that would be met with? I anticipated that these cross-sections would apply to certain kinds of ground, but what lengths of the different kinds of ground would be met with was another matter. I did not anticipate that.

15871. *Mr. Smith.*] This plan was made under Mr. Darley? Yes.

15872. *Mr. Parkes.*] In your memorandum No. 1 you also say, "When Mr. Hickson saw the pitch it had reached (referring to the speculation in tendering), as indicated by that contract, he decided to adopt an entirely new system, which has since been introduced, where applicable, in the other branches of the Department of Public Works and also by the Water Supply and Sewerage";—have you any documents connected with that change of system? Of what description?

15873. Minutes, letters, instructions—are there no records? I think I have already said in my evidence that the only instruction I can remember being issued by Mr. Hickson was one upon a sheet of note-paper which was sent to Mr. Bagge, but whether that was registered in the usual way or not I am not in a position to say. The instruction, I know, was given.

15874. Were there any other documents besides that? Not in connection with the initiation of the system.

15875. You say further on in your memorandum, "Before the work was undertaken, therefore, and in the absence of a knowledge that has since been gained concerning the nature of the ground, a fair average value for the contract was fixed by the Department at £64,420. Results have shown the average valuation of the finished work made by eleven experts under the most unprejudiced circumstances is £64,555";—who were those eleven experts? The tenderers.

15876. You call them experts? I would, certainly.

J. Davis. 15877. You say that the office estimate was £64,420, and that the value of the work, as executed at the office rates, was £63,831, but there were a great number of items which were put into the office estimate which were altogether eliminated? There were a number of quantities put into the schedule which were not carried out.

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15878. Which went to make up the sum total? Which were included in the office estimate.

15879. But they go to make up the total of the estimate? Yes; but you must remember that the whole of these quantities in some cases were not carried out, there being no necessity for them. On the other hand there was a necessity in some cases for increasing the quantities. You have to take the one against the other. What we say is this, that the office idea of the value of the work was £64,420; and that, taking the opinion of the eleven experts of whom I have spoken, proves to be practically correct.

15880. The habit of the Department, then, is to fill their estimates with every probable quantity of material and labour, whether it be adopted or not? The habit of the Department is to make provision for the different kinds of work that are likely to be carried out in any contract. The working of it out may result in this—that some of the items may not be required. On the other hand, some of the items may be increased, and you have to put the one against the other.

15881. You make this statement: "Since the inauguration of the Sewerage Branch in November, 1879, up to the present date, 117 contracts have been let and completed, with the following result:—Amount of tenders worked out at schedule rates, £1,440,225; total amount of final vouchers, £1,433,186";—no definite conclusion can be drawn from that, judging from what you now say? A very definite conclusion. To begin with, although the contractors take advantage of the uncertainty of the probable quantities, and in many cases put in fancy prices and in other cases put in absurdly low prices, on the whole, although we have these large and small prices to contend with, and although the quantities in the schedule have to be adjusted to the work as it is carried out, there was a saving to the Department, upon the old system, of £7,000 in £1,500,000; so that it is pretty evident from that—it is pretty conclusive—that the Department did not lose in the past. What it might have done in the future, if the system had not been changed, is another thing.

15882. When you take out some items and increase others, how can you tell whether a contract has been expensive to the country or otherwise; it may come out at a certain sum total, but when you change the items, how is it possible for you to say whether the contract has been an expensive or a cheap one; take Contract 79; a certain number of items were eliminated from that and some were put in, still the total comes out at practically the same? I think we are talking a little at cross purposes. When you speak of elimination, I do not for a moment admit that there has been elimination. I say that in preparing our contracts we have, to a certain extent, to work on problematical lines. We have to provide for every emergency that may arise. We have to put in items which may be required or which may not. In some cases items may be reduced, in other cases they may be increased; but taking everything into consideration, and in spite of the fact that contractors have speculated to some extent—and more especially immediately before the change of system—we have been £7,000 to the good in work of an uncertain nature amounting in value to £1,500,000.

15883. It would be all right if the range of prices put to each schedule were correct, but where the range of prices rises sometimes as much as 100 per cent., and where in other cases it is lowered 200 per cent. you cannot tell what the total is as far as the saving to the country is concerned? Yes; you can. I think the evidence I have just given in answer to your question is conclusive on the point.

15884. That is what you think? That is my opinion.

15885. In your first memorandum dealing with Contract No. 69 you also say, "The uncertainty of the nature of the ground, and other circumstances connected with the construction of sewerage works, make it expedient to provide in the schedule items for work which may possibly be necessary, in order to obtain prices for them. By this means a check is kept upon exorbitant extras, for contractors, if not tied down to price at the time of tendering, would afterwards quote very much higher rates for extras." You have a clause in your specification stating that extras shall be paid for according to the value put upon them by an arbitrator if the Government engineer's estimate is not accepted by the contractor—is not that so? I do not think so.

15886. Look at clause 16 relating to extras, which is printed upon page 116? Yes; but the question you asked me was in reference to the arbitration clause, I understood.

15887. But take clause 16? If you take that clause, my answer to your question would be slightly different.

15888. Would it not be preferable to allow the extra work to be valued and paid for under clause 16, and also under your arbitration clause, rather than to allow it to remain to be paid for as a fixed extra, when you see that contractors' schedules are sometimes accepted with items 500 per cent. above value? I would say first of all that the arbitration clause has very little to say in the matter, because before you can put the arbitration clause into operation, the amount in dispute must be over £500. Then, secondly, as to clause 16, relating to extra work, the omission of work, and so on, if the engineer and the contractors cannot agree as to the rate to be paid for any particular work, it is within the power of the engineer to omit that work altogether from the contract. It would, however, be most inconvenient, and almost impossible. Take subducts. How would it be possible to call in another contractor to carry out subducts?

15889. You are now departing from my question. You say in your memorandum, "By this means a check is kept upon exorbitant extras, for contractors, if not tied down to price at the time of tendering, would afterwards quote very much higher rates for extras." I say that when you are compelled by your contract to pay the contractors extras 500 per cent. above value if they happen to put that price into their schedule, would it not be better to leave those extras to be paid for according to their reasonable value? I think the proper way is to include in a schedule every item that is likely to be required in a contract. That is the most economical, and certainly the most business-like way of dealing with the matter. I again say that in my judgment, gathered from my own experience, in connection with contractors, certainly the Department would be at a decided disadvantage if they had to arrange rates for any particular kind of work after the contract had been let.

15890. In the same memorandum you also say, "And it was also pointed out that, while in the specification this provision was made, pitchers were not shown on the contract drawing to be put round all the covers. The Engineer-in-Chief, Mr. Hickson, took advantage of this, notwithstanding the strong protest on the part of the contractors." There is no strong protest on the part of the contractors disclosed by the Parliamentary papers? It was a verbal protest made in my presence.

15891.

15891. And what was the nature of it? They considered that, seeing that they had Contract 69, and that the specification required from them pitchers round every manhole cover, it was only fair and equitable that they should carry out the work in accordance with the specification in spite of the fact that the Department would have to pay very heavily for the pitchers.

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15892. *His Honor.*] Who was present on that occasion? Mr. Carter, I think, was the only representative of the contractors. I am not quite sure upon the point. It is possible that Mr. Snodgrass may also have been there.

15893. Who else was there? Mr. Hickson and myself.

15894. Where did the interview take place? In Mr. Hickson's room.

15895. Will you repeat as nearly as possible the actual conversation which took place to the best of your recollection. First of all can you tell us how the meeting came about? To the best of my recollection, in May, 1894, as I have already explained to the Commission, it was discovered that £50 per square yard had to be paid for these pitchers. I immediately wrote a minute, which is given in the Parliamentary papers, and I think Mr. Hickson then instructed that Carter & Co. might be asked to call. They knew that the matter was being taken into consideration, and they did call, and they saw Mr. Hickson in my presence. Then it was that the whole matter was discussed. My position—and I put it down in writing—was this—that if the contractors got the 12 square yards given in the schedule they would certainly not be dealt hardly with. Mr. Hickson thought that, although the schedule did mention 12 yards, that was only a probable quantity, and that as the drawings showed 32 square yards the fairest way would be to allow the contractors that number. He made that suggestion, and to that the contractors eventually agreed.

15896. When Mr. Hickson expressed that opinion did the contractors press the matter further, or were they inclined to accept his suggestion? They thought they were entitled to the whole in accordance with the specification, but Mr. Hickson said that he would not go any further than he had indicated, and the contractors finally agreed to that.

15897. Was there much discussion as to the balance—the difference between the amount shown upon the plan and the amount calculated from the specification? No; I do not think there was a very great deal said. Mr. Hickson thought the course he indicated was the fairest one to adopt.

15898. The contractors strenuously objected, I suppose, to their being tied down to the 12 yards? Yes; very strongly. They thought that would be a most unfair and unjustifiable proceeding. Mr. Hickson, taking into consideration the low rates they had upon other items, thought that although the price for the pitchers was absurdly high they ought to have the advantage of it.

15899. Did the interview take place between the 9th—the date upon which you wrote your minute—and the 11th—the date upon which Mr. Hickson wrote his minute—or after? Between the two dates. I think it was on the 11th. I think it very likely that Mr. Hickson would put his decision down on paper at once. That was his usual practice. My impression is that Mr. Carter was asked to call. It is probable that, when I submitted my minute of 9th May, Mr. Hickson would ask me to write to the contractors or to telephone to them, asking them to call. But there is no record of that.

15900. Do you remember whether or not Mr. Hickson expressed his opinion as to the price of £50 a square yard for the pitchers in the presence of the contractors? He foresaw that we were in a fix. Notwithstanding what Mr. Bagge said in his evidence, this price of £50 per square yard was not known to exist, except to the contractors, until the contract had been in force for some time. It was due, I think, entirely to the clerk who wrote out the schedule from the original. When a contract is signed, Mr. Norrie sends it in to me, and I get a number of copies made from the schedule attached to the contract. In some unaccountable way the clerk put down opposite this particular item £50 instead of 50s.

15901. The clerk must have assumed that £50 was a mistake? I knew nothing about it until the price was challenged by the contractors. I sent for the bond immediately, and I then found that 50s. was wrong and £50 correct.

15902. Do I understand that Mr. Bagge was the only officer of the Department who would have gone through the schedule, and who would, therefore, be likely to have noticed the error? He was the only officer who would do anything of the kind. He had that duty wholly and solely to himself. The tenders when they were received by the Tender Board were put into a list. They were then sent on to Mr. Bagge for report. He then would submit them to the Engineer with his report, and, unless he called attention to any enormity or anything out of the way in connection with any particular tender, it would go on for acceptance.

15903. He never did call attention to this item of £50? Not so far as I know. He certainly did not say anything to me. He spoke to me of the two small matters which he mentioned in his report, and which Mr. Hickson thought of no importance. If you turn to page 66 of the Parliamentary return, you will see that he says:—

Messrs. Carter, Gummow, & Co., being the lowest tenderers for the construction of the Western Suburbs Main Eastern Branch Sewer, Contract No. 69, I beg to recommend acceptance of their tender, amounting to £45,207 8s. 11d., at schedule rates, on condition that they fill in and initial in their tender the average price per ton for all irregular castings, weighing in all 33 tons 12 cwt. 3 qrs. 12 lb., and the average price per ton for all cast-iron pipes, weighing in all 783 tons 8 cwt. 2 qrs. 27 lb.

Mr. Hickson writes upon that "Not necessary." I remember Mr. Hickson's seeing me about the matter and discussing whether it would be necessary to get the alteration made. Mr. Hickson came to the conclusion that it would not be necessary, and he then recommended Carter & Co.'s tender for acceptance.

15904. When the interview took place, according to your recollection, it had only just come to your knowledge, and, as far as you could see, it had only just come to Mr. Hickson's knowledge, that those pitchers were scheduled in the tender at £50 per square yard? Yes; I positively swear that.

15905. Do you remember whether Mr. Hickson did or did not say something to the contractors, when they came, in relation to that matter? In the first interview in regard to the pitchers, I submitted my minute to Mr. Hickson. He thought that we should have to consider the fact that it was a schedule rate, and that, although it was a very high one, there were also low ones in the schedule. He did not say positively, then, what he would do until he had seen the contractors. That was the first conversation I had with him in reference to the matter.

15906. Did it not strike everyone that it was a little trick on the part of the contractors—that they had taken advantage of a mistake made in the schedule—12 yards being substituted for a larger number? That was very clear.

15907.

J. Davis. 15907. That being so, were no strong comments made by anyone at the interview as to the impropriety of that course? I dare say there were; but I do not recollect the precise words used.

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15909. It would be admitting that the Department had made a mistake? Whether the Department made a mistake or not, he put it in that way. I know, from what he said, that he was of opinion that anything which had to be said on the point should have been said before the tender was accepted.

15910. *Mr. Parkes.*] You say:

The Engineer-in-Chief (Mr. Hickson) took advantage of this, notwithstanding the strong protest on the part of the contractors, and decided that only those pitchers were to be carried out that were shown on drawing, and instructions were given to the officer-in-charge accordingly [see Parliamentary Papers, page 125, No. 17]. Before, however, the contract was completed, Mr. Darley was appointed Engineer-in-Chief for Metropolitan Sewerage Construction, and the works were taken over by him, and another Resident Engineer put in charge, who appears not to have known of Mr. Hickson's decision; and the contractors pitched, with two exceptions, the whole of the manhole covers, and were paid for them in the final voucher.

With regard to that, how comes it that the vouchers which were paid prior to the work going over to Mr. Darley showed 17 square yards? I do not know that that is the case; but, supposing the quantity to be 17 square yards, the explanation is very simple. There would be only that quantity carried out at that time. The bluestone pitchers would be almost the last thing that would be done on the contract.

15911. If in the voucher just before the work was handed over to Mr. Darley 17 square yards are shown, that would show that Mr. Hickson and your Department intended to pay the item right through, does it not? I do not quite understand the question.

15912. What I mean is that the 17 yards exceeds the 12 given in the Schedule? Yes.

15913. *His Honor.*] Ultimately 35 yards was the quantity paid for? Yes.

15914. Two manholes in addition to that number were shown upon the plan which were not pitched at all? That is so.

15915. *Mr. Parkes.*] With reference to the retention and fixed deposit money being returned to the contractors, you give a list showing that two contractors in the Sewerage Department, five contractors in the Railway Department, one in the Telegraph Department, one for the Agricultural College, and so on, going right through the other Departments, were dealt with in this way;—were the two cases in the Sewerage the only two cases in that Department? I do not say that. I asked the clerk in charge of the fixed deposits to make a list representing the general practice of the Department. I do not say by any means that this list exhausts the number of cases.

15916. But did you not say before His Honor that they were in the Sewerage Department alone? I did not say that these were the only cases. What I say is, that it is a fair representation of the practice of the Department.

15917. But can you prove the existence of any other cases in the Sewerage Department? I do not know that I could. I might be able to do so.

15918. Can you prove any cases beside the two which I have enumerated in this list? I do not know.

15919. Do you know of any other cases? I do not remember any.

15920. I will ask you to produce a list of any further cases that may exist? I will do so. Remember that I am speaking now of fixed deposits only, not of retention money.

15921. Can you prove the existence of any other cases? I asked the clerk in charge of fixed deposits to supply me with a list representing fairly the practice of the Department, and this is the list with which he supplied me.

15922. *His Honor.*] If any other cases can be found to have existed in the Sewerage Department will you produce them? Yes.

15923. *Mr. Parkes.*] The clerk who prepared the list appears to have gone all over the Department? My intention was to show that what was done in one case was done in another, and that we were dealing with Carter, Gummow, & Co. in full unison with our practice as regards other contractors.

15924. The railways have nothing to do with the Sewerage Department? I am speaking now of the Department of Public Works. What Mr. Deane has done in the Railway Department, Mr. Hickson has done in the Sewerage Department. What Mr. Vernon has done in the Architect's Department, Mr. Hickson has done in the Sewerage Department. What has been done in the Post and Telegraph Department—altogether another Department, I admit—has also been done in the Sewerage Department.

15925. The other day I asked you for some information with reference to the sureties in the case of Gilliver and Ahearn; have you that information? Yes; the papers are here now, I think.

15926. In the case of Gilliver, did you not object to having his son as a surety, although Mr. Gilliver assured the Department that his son was a man of independent property? Gilliver and Curtis wrote to Mr. McLachlan, as Chief Clerk of the Public Works Department, on 28th December, 1893, as follows:—"Sir,—We have the honour to submit Mr. Henry J. P. Gilliver and Henry S. Gilliver as sureties for our Contract No. 97, Rookwood Cemetery drainage, first division.—We are, sir, yours obediently, GILLIVER AND CURTIS." Mr. McLachlan refers that letter to Mr. Hickson, and asks if the names are satisfactory. Mr. Hickson evidently sees Mr. Gilliver between 29th December, 1893, and 2nd January, 1894, and he writes: "I saw Gilliver and Curtis, who are to submit another name." Then, on the same dates, Mr. Hickson wrote: "The names of Messrs. R. C. Watkins and H. L. Gilliver might be accepted." Mr. Barling writes, "Accept." That is the history of the case as far as it appears from the papers.

15927. Mr. Gilliver's son was accepted? Mr. H. L. Gilliver was accepted.

15928. In the case of Ahearne's contract, what was done? On the 31st January, 1893, Mr. Ahearne wrote to the Under Secretary for Public Works as follows:—"Sir,—I have to submit, for the approval of the Minister, the names of the following gentlemen as security for my Contract 101, main outfall sewer, viz., Henry Hudson, Darling Point; Hugh M'Ardle, Sydney.—I am, sir, your most obedient servant, JOHN AHEARNE." I ought to explain that Mr. M'Ardle's address was given originally as Brisbane; but the word "Brisbane" has been crossed out, and the word "Sydney" substituted in different ink, the alteration being initialled by Mr. Ahearne. Mr. Hickson says: "I recommend that Mr. Ahearne be asked if Mr. M'Ardle has property to the value of the penal sum required in the Colony; if not, he should be asked to give a name of some one who has." Mr. Barling writes "Ask"; and Mr. McLachlan writes "Mr.

Ahearne

Ahearne states that Mr. M'Ardle is a large property owner in this Colony." Mr. Barling then says, "This seems to be all right." The matter is referred to Mr. Norrie, and Mr. Hickson then says, on the 8th Jany., 1894, "Yes." That is the history of that matter as it appears from the papers.

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15929. *His Honor.*] The form of undertaking which you now produce is the form which is now used? Yes.

15930. Can you fix the date of the initiation of the system? It has been in vogue for a great number of years. To the best of my belief it has always been the practice more or less to meet the contractors when they made an application of this description relating to a fixed deposit, so long as the Department do not incur any risk.

15931. It was Mr. Norrie's idea to put this undertaking into a printed form for convenience sake? Yes.

15932. *Mr. Parkes.*] Coming now to the advances upon cement to Messrs. Carter, Gummow, & Co., why do you, in dealing with the advances on material in your memorandum No. 3, take Contract 69 as the first contract, when Contract 79 bore a prior date? There was no particular reason.

15933. Mr. Christie's report deals with the contracts in the order of their date;—why did you take Contract 69 first? I expect, because 69 stands before 79 in the order of the contracts. I do not know of any other reason.

15934. *His Honor.*] You are referring to their numerical order? Yes.

15935. *Mr. Parkes.*] Was there any Ministerial authority obtained for the advance in the case of Contract 79? That I could not say; if there was I presume it would appear in the papers.

15936. If it is not in the papers would there be any? There might be, but it is not probable.

15937. In the case of Contract 79, your certificate shows that the advance is not on the material, but that cement is stipulated; you say in your memorandum that the contractors receive a large advance because they had plant to the value of £3,000 on the ground? I do not say "because," I say that, in giving the large advance which was given on cement, that was taken into consideration.

15938. You took into consideration the plant? Yes.

15939. But your specification says that the plant is to be held as security by the Government, does it not? No.

15940. Are you sure there is not a clause to that effect? Yes; I think you are referring to clause 8 of the general conditions.

15941. The clause I refer to is clause 14; is it not evident that the plant is held as part of the security of the Government under the contract? I think that in making an advance as we did in the case of the cement, it would be taken into consideration that the plant was the property, in accordance with the contract, of Her Majesty.

15942. Ought the plant to be taken into consideration at all; that is the question? All I have to say is that it was in this instance. The plant was there. It was security in addition to the fixed deposit. In addition to plant we had a large stock of material, and in making the advance upon the cement the whole circumstances connected with the securities were taken into consideration. That would be done in all cases.

15943. But the clause to which I refer says that the material is the property of Her Majesty, until the completion of the contract? Well, the material is advanced upon this month, but it would be in the work next month, and paid for.

15944. But as to the plant? I am talking of the material.

15945. The greatest amount you had authority to advance as regards the material, was £1,360, was it not? £1,360 is the amount named in the agreement upon page 317 of the Parliamentary papers.

15946. Yet you advanced to the extent of £2,160; that is the fact, is it not, according to your own evidence? It appears to be so.

15947. *Mr. Smith.*] The agreement was to cover future advances besides the £1,360? Yes.

15948. *Mr. Parkes.*] You said in your evidence that the Department kept the most complete check upon the cement that went to various contracts? Yes.

15949. Do they test every parcel of cement that goes to a contract? Yes.

15950. What about the cement which is shifted from one job to another? That is tested.

15951. But how do you know that it is the same cement that is moved? We take care to know.

15952. But how do you find out. Take the Marrickville contract and the Johnstone's Creek contract. Supposing cement is taken from the one job to the other, how do you know that they may not have taken cement which has never been tested? I do not quite understand you. I have already said that if cement is tested upon Contract 69 we know it to be tested. Suppose the cement goes to Contract 77 we know that the tested cement leaving Contract 69 goes to that contract.

15953. Suppose that cement is moved from Johnstone's Creek to Marrickville, is it tested again when it comes on to the Marrickville contract? It is tested at Johnstone's Creek—taking that contract for illustration—and, if the cement goes to the Marrickville contract, it is known when it goes to that contract that it is approved cement.

15954. How do they know that? It does not leave the control of the Department at any time.

15955. Suppose the contractor shifts it? It would be just the same.

15956. But cement may be brought upon one job which has not been taken from another. How would you know that? We should know in this way—the cement which would leave the Johnstone's Creek contract would be branded with the Departmental brand, and marked. In addition to that, apart altogether from the delivery of the cement, the officer at Johnstone's Creek would communicate with the officer at Marrickville the fact that certain cement was going to the Marrickville contract. The communication would be to the effect that so many casks of cement had left the Johnstone's Creek work, and that it had been branded in a certain way on a certain day. That cement would go to Marrickville, and it would be accepted on that certificate.

15957. It would not be shifted without the knowledge of the Department? What I say is that cement, after it is approved, is kept in the hands of the Department until it is used, and if it is not in the hands of the Department during the whole of the time, from its approval until it is put into the work, it is not accepted as approved cement. If it leaves the control of the Department at all it is not accepted as approved cement.

15958. Your tests on Contracts 79, 69, and 79A, according to your test book, and your certificates, amount to 11,740 casks—would that be a proper record? I do not know what you are speaking from.

15959. The list is taken from your record book, and in conjunction with the evidence of Mr. Roberts, who tested



- J. Davis. tested the cement. These documents show that 11,740 casks of cement were tested for these three jobs;—  
 7 Sept., 1896. that would be the full amount? I do not say so. I do not know what you are reading from.
15960. It has been put in in the evidence of Mr. Christie—you will find it upon page 294 of the evidence—you will see there a tally of the certificates signed by Mr. Hickson for the whole of the cement which passed the tests for these three jobs, amounting in all to 11,740 casks;—I suppose your books would be right if they tallied with the sheets of the inspectors' returns? What have the inspector's return sheets to do with it?
15961. These tests of yours will be reliable as to all the cement which went on to these jobs? It will be reliable as far as they go.
15962. You have said in your evidence that nothing wrong can occur because your check is so absolutely complete? That is what I say now. I do not refer to the check by Mr. Christie. I mean the check to which I referred in my evidence.
15963. What is that check? I described it very fully.
15964. In your former evidence you have given a full description of it? Yes.
15965. And you said then that every portion of cement was tested when it went on to a job? I say so now.
15966. So that the test-book is accurate; and according to that the record produced by Mr. Christie is also correct? I say it is not.
15967. Why? Mr. Christie's record is a copy of the certificates as they appear in Mr. Roberts' book.
15968. It is a copy of the certificates issued and checked by Mr. Roberts' book—would that not be correct? No.
15969. Why not? Because they represent the thing only as far as it goes.
15970. How much further can it go? It may go to any extent.
15971. In what way? What I say now is what I said before—that the inspectors' returns made upon these contracts fairly represent the quantity of cement—I do not say to within 5 per cent.—used upon the contracts, let it come from where it may. If Mr. Christie's statement here does not show that quantity then I say that his statement does not go far enough.
15972. But Mr. Christie's statement is not a return from the inspector's reports; it is a return from your certificates and test-books? I understand that; and I say that, although that may be so, it does not go far enough if it does not go as far as the inspectors' returns which you have had.
15973. Supposing the inspectors' returns show that 13,000 casks were delivered on these three jobs, would that be correct? The inspectors' returns would, to within 5 per cent., fairly represent the quantity of cement used; but half a cask of cement is used here, a full cask there, and three-quarters of a cask in another place. They would have to collect all these small bits of cement together, and make out a total. You can easily understand that, in making that up, they might be a little out.
15974. How can you account for a discrepancy of 2,000 casks between the inspectors' returns and the certificates? I do not say that there is a discrepancy. I have not seen any evidence as to the inspectors' returns. (*Vide Appendices Nos. 31, 38, and 55*).
15975. Have you not made up the inspectors' returns? Necessarily I know what the inspectors' returns are.
15976. Do they not amount to 13,000 casks? I do not know.
15977. Did you not give me all the inspectors' returns and books? I believe you have all the information for which you asked.
15978. And if I have gathered the information without any break of date from these books and returns, would it be correct? I should like to hear the evidence given. I should then be better able to answer the question.
15979. Accepting the return as correct, can you tell me how the discrepancy of 2,000 casks would occur, speaking with reference to Contracts 79, 79A, and 69? I think I can account for it in more ways than one. I will take one. At the time work was suspended on Contract 72 there must have been from 3,000 to 4,000 casks of approved cement upon Contract 72. A portion of that cement, from evidence which has been given to this Commission, to the extent of, say, 2,000 casks, was carted from Contract 72 to Contract 79. That would be one way of accounting for it. That may have occurred in the case of other contracts. I know that it was the practice of Carter, Gummow, & Co., and of other contractors, in order to keep their works going, to move approved cement from one contract to another, so that it is difficult to say how much cement would be taken from one contract and how much from another.
15980. The 2,000 casks you have mentioned would make up the discrepancy? I do not say that there is any discrepancy. You are pleased to call it so.
15981. If a discrepancy did exist, that would account for it? I do not know if it would. It might or it might not. You want me to be definite, but I cannot be definite because evidently you have not all the facts before you.
15982. But have you not carefully taken out this very return I am speaking of? Yes, necessarily so.
15983. Therefore you have no excuse for speaking indefinitely? I can speak as definitely as your questions will admit of, and I am endeavouring to do so.
15984. Do not the returns of your inspectors show that 13,000 casks was the number used in connection with these three contracts? I could not tell you without looking the matter up.
15985. Will you produce the returns? I will look up the returns of the quantities actually used in these three contracts.
15986. *His Honor.*] The testing of cement for a contract does not prove conclusively that the cement is used on that contract, as it may pass through one contract to another? Yes; there is another thing which Mr. Parkes leaves out of his calculation in referring to Mr. Christie's statement, and it is this—he tabulates what, I have no doubt, he finds in the test-book as tests made for these particular contracts. He forgets altogether that it is the practice of the Department to pass cement in bond, irrespective of where it is used. The cement is carted from the bonded store to the contract, and in that way would not show in the test-book at all. Suppose 1,000 casks of cement are tested in bond, they would be issued from the bond to a particular contract where they might be required.
15987. How do they appear in the test-book? They do not appear there at all. You might have 10,000 casks tested in bond, and they might be distributed, perhaps, all over the Colony.
15988. Would it not appear in the test-book under some heading? As tested in a certain bond for a certain merchant.
- 15989.



15989. But not relating to any particular contract, on the face of the test-book? No; as I say, it will be possible for 10,000 casks of cement to be sent all over the Colony for different purposes. We test for the Military Department, and for the Mines Department, and for all branches of the Public Works. They will get any cement they require from time to time from some of the large parcels of cement which had passed the test. Any Government contractor, for instance, might go to an agent for a particular brand of cement and buy of him cement which had been passed. J. Davis.  
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15990. Will you swear that your certificate sheets do not correspond with the certificates that you issued to the contractors? We issue no certificates to the contractors. I am speaking of cement certificates. If a contractor requires a certificate he has to pay for it in the usual way. The agents often ask for certificates. They will often ask for a test to be made and they have to pay for the test and certificate in conformity with the scale of prices approved by the Minister.

15991-2. *His Honor.*] A good deal of cement is passed for merchants before it is actually sold to any contractor? Yes. I will explain the process. Take Parbury, Henty, & Co., perhaps the largest cement importers—at all events they have been in the past. They come to us when they get a cargo of cement, and say, "We have 10,000 casks of such and such a brand of cement in bond. We propose to use 5,000 casks on public works." We say, "Very well; we will test it." We send down a man and take samples. They hand to us, as a matter of good faith, the bond certificate. We hold this bond certificate. If the cement is in a store we put our own lock on the store, and we retain possession of the cement until the tests are completed. When the tests are completed we say we will accept or reject the cement, as the case may be. If we reject the cement we hand back to the merchants their bond certificates for them to do what they please with, and from that time we have nothing to do with the cement. If we approve of the cement the bond certificate is handed to our storeman, and he attends from time to time at the bond and brands the cement as it leaves. We issue with the cement a delivery note to the officer to whom the cement is going, and by that means we keep control over it from the time samples are taken until it is in the work.

15993. The casks are not branded until they go out? No; we could not brand them before we have approved of the cement, and we could not brand them afterwards until they are leaving the bond, because they are all piled one on the top of another.

15994. You have no opportunity of handling each individual cask until they are handled on leaving the bond? No.

15995. *Mr. Parkes.*] Here are certificates, which have been found in the portfolios of the various contracts, which correspond with the contents of Mr. Roberts' book; I will ask you to read that application to the office? Yes. "Sample of cement to be tested has been forwarded to you; brand, Red Cross; manufactured by Wouldham Cement Co., London, and selected by Messrs. Carter & Co. from a parcel of fifty casks, to be used on Contract 79 by Messrs. Carter & Co., contractors.—(Sd.) J. W. T. BOYS, Officer Superintending Contract." In that case it should not be cement selected by Messrs. Carter & Co., but cement selected by Inspector Lougheed.

15996. Will you read the heading on this certificate? Yes. "Sample of Portland cement selected by a Government officer on 2nd April, 1894, at Contract 79 from a shipment of fifty casks manufactured by the Wouldham Cement Co.; brand, Red Cross; contractors, Carter & Co." (*Vide Appendix No. 38*).

15997. The other certificates I hand you also apply to cement going to Contract 79? They appear to be certificates in respect of cement which was stored on Contract 79.

15998. The certificates I now hand you are for parcels of cement stored on Contract 69? Yes; in so far as they relate to cement.

15999. Do they relate to anything but cement? Yes.

16000. They are all signed by Mr. Hickson, and countersigned by yourself? One is signed by Mr. Bagge, one is not signed, and the rest are signed by Mr. Hickson.

16001. There is no doubt that if they correspond with the purchases from the merchants and the deliveries they must be correct? If what correspond?

16002. If these certificates of test upon the ground correspond with the deliveries of the purchases of cement from the merchants by Carter & Co., they must be correct? The certificates themselves are correct enough.

16003. Is it not the fact that in your certificate book you mark every item of cement to whatever contract it is going? I have already said that we do not.

16004. Then why do you put at the head of your certificates 500 bags, 180 bags, 620 casks, and so on? At the time the sample is taken those quantities would be where the certificates say they are, but beyond that the certificates do not go. After the cement is approved it may be used in one place or it may be used in another.

16005. No perfect check could be kept then? There is an absolutely perfect check, and the proper quantity of cement, moreover, has been used in the work.

16006. The perfect check to which you refer is contained in the returns of the inspectors? That is one of the checks. That would be a check as far as it goes; but there are a number of checks.

16007. What other checks are there? There is the measurement of the concrete.

16008. How do you make up those measurements;—what is your standard measurement? It varies—there is no standard. There are two or three things to be taken into consideration in coming to a conclusion as to the quantity of cement that should be used in any particular concrete work.

16009. But you have a standard have you not? No; it would be utterly foolish to attempt such a thing.

16010. Then how can you rely upon your measurements? You must take the circumstances into consideration before you can say what quantity of cement would be used in any particular work. The question of the dryness or otherwise of the concrete, for instance, makes a difference of, perhaps, 7 per cent. Then there is the position of the concrete to be considered. In some cases it has to be put in vertically, and in other cases horizontally. Everyone who has had to do with concrete also knows that you can make as much as 10 and 15 per cent. of difference in the ramming; then the smallness and the shape, generally, of the stones has to be taken into consideration, so that for anyone to say that you can have one standard, and make it apply to any piece of concrete work, is simply folly.

16011. Have you the particulars as to how you made up the cost of the Monier work in Contract 77? I have some notes here. I have taken the cost of the material by itself. I have taken the cost of the labour, the cost of the timber, ironwork, supervision, and plant, and I have added 10 per cent. for profit. I have left out of the question what might be fairly allowed for guarantee, or patent rights.

J. Davis. 16012. Will you read the particulars? Yes. They are as follow:—  
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## JOHNSTONE'S AND WHITE'S CREEKS AQUEDUCTS.

Estimate of cost per cubic yard of Monier Structures.

|  |   | £     | s. | d. |
|--|---|-------|----|----|
| 1. <i>Cost of Labor.</i>                         |   |       |    |    |
| Labor in building                                | 17 spans of aqueduct, at 63/16/- per span .....                       | 1,084 | 12 | 0  |
| "  | " 42 small end arches, at 3/4/- .....                                 | 134   | 8  | 0  |
| "  | " 574 lin. feet of carrier at ends, at 19/15/- per 82 ft. 10 in. .... | 136   | 17 | 2  |
| Estimated cost of labour in both aqueducts ..... |   | 1,355 | 17 | 2  |

Cost of labor per cubic yard would then be  $\frac{£1,355 \text{ 17s. 2d.}}{1,533 \text{ cubic yards}} = 17/8.$

2. *Cost of timbering, including labor in making, ironwork, &c.*

|   |  | s.     | d. |
|---|--|--------|----|
| Timber in ribs of main centering, &c., 13,248 superficial feet, at 29/- ..... |  | 3,842  | 0  |
| " trestles, &c., 25,776 superficial feet, at 12/- .....                       |  | 3,093  | 6  |
| " lagging, boxing, &c., 30,100 superficial feet, at 14/- .....                |  | 4,214  | 0  |
| Estimated value of requisite timber .....                                     |  | 11,149 | 6  |

Cost of timber per cubic yard would then be  $\frac{11,149\text{s.}}{1,533 \text{ cubic yards}} = 7/3.$

3. *Cost of supervision.*

Assuming that the aqueducts will take twelve months to build, and allowing £300 per annum for supervision of an engineer, the cost of supervision per cubic yard would then be  $\frac{6,000\text{s.}}{1,533 \text{ cubic yards}} = 3/11.$

4. *Cost of iron grilling.*

40½ tons of rod iron from ¼-in. to ¾-in. diameter at £11 .....

8,910 0

Cost of grilling per cubic yard would then be  $\frac{8,910\text{s.}}{1,533 \text{ cubic yards}} = 5/9\frac{3}{4}.$

8. *Cost of material in compo.*

Given 12 cubic feet of sand, and 1 cask of cement—in place 13½ cubic feet.

Sand costs 7s. 6d. per cubic yard on works ∴ 12 cubic feet costs .....

3 4

1 cask of cement costs on works .....

11 9

Cost of 13½ cubic feet .....

15 1

∴ 27 cubic feet of material in place would be .....

30 2

6. *Cost of bluestone concrete material.*

Given 10 cubic ft. stone, 6 cubic ft. sand, and 1 cask cement, equal in place 15 cubic feet.  
Blue metal costs on wharf 6/10 per ton.

Taking weight of bluestone at 170 lb. per cubic foot, and assuming 30 per cent. of void in bulk, 1 ton of metal would measure, say, 18.5 cubic ft., ∴ 27 cubic ft. would cost .....

£ s. d.

0 10 0

Carting to site of works .....

0 2 6

Cost of metal per cubic yard .....

0 12 6

If 27 cubic feet costs 12/6, 10 cubic ft. would cost .....

0 4 7½

6 cubic feet of sand, at 7/6 per cubic yard .....

0 1 8

1 cask cement .....

0 11 9

Cost of 15 cubic feet of material .....

0 18 0½

∴ cost of 27 cubic feet of material in place would be 32/5½.

7. *Average cost of cement structure per cubic yard.*

In the 2 aqueducts there are 358 cubic yards compo., at 30/2 .....

539 19 8

" " 1,175 " concrete, at 32/5½ .....

1,906 18 6

Cost of material in compo. and concrete .....

2,446 18 2

Cost per cubic yard would then be  $\frac{£2,446 \text{ 18s. 2d.}}{1,533 \text{ cubic yards}} = 31/11.$

8. *Cost of plant, &c.*

|  |      |    |    |
|--|------|----|----|
| Half value of two sheds, estimated at £100 .....                         | 50   | 0  | 0  |
| " office, " £100 .....   | 50   | 0  | 0  |
| " tools, " £20 .....   | 10   | 0  | 0  |
| Value of barrows worn out on work .....                                  | 15   | 0  | 0  |
| Service of watchman for 52 weeks at 36s. ....                            | 93   | 12 | 0  |
| Half value of 200 lin. ft. of water-pipe at 5d. per ft. ....             | 20   | 16 | 0  |
| Cost of water, at 1½d. per cubic yard of structure, = 1,533 at 1½d. .... | 9    | 11 | 7½ |
|  | £249 | 0  | 3½ |

Cost of plant per cubic yard would then be  $\frac{£249 \text{ 0s. 3½d.}}{1,533 \text{ cubic yards}} = 3/3.$

Summary.

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| <i>Summary.</i>   |  | £  | s. | d.              |
|---|--|----|----|-----------------|
| Estimated cost of material in compo. and concrete per cubic yard (see item 7) ..... |  | 1  | 11 | 11              |
| „ labour per cubic yard (see item 1) .....  |  | 0  | 17 | 8               |
| „ timber „ (see item 2) .....   |  | 0  | 7  | 3               |
| „ ironwork „ (see item 4) .....   |  | 0  | 5  | 9 $\frac{3}{4}$ |
| „ supervision „ (see item 3) .....  |  | 0  | 3  | 11              |
| „ plant, &c. „ (see item 8) .....   |  | 0  | 3  | 3               |
|   |  | £3 | 9  | 9 $\frac{3}{4}$ |
| Add 10 per cent. for profit .....   |  | 0  | 7  | 0               |
|   |  | £3 | 16 | 9 $\frac{3}{4}$ |
| Estimated total cost per cubic yard .....   |  | £3 | 16 | 10              |
| Say .....   |  | £3 | 16 | 10              |

16013. In the memorandum you read the other day dealing with this matter, you put down as your second item: "Ironwork, excluding grill, 18·2 tons, at £20"; is not that an enormous price? No.

16014. Where is that ironwork? It is the channel iron and the tie bars.

16015. Is that all? There is the grilling, the fitting, and all the rest of it. I think I have allowed the usual price for that kind of work.

16016. Does that amount include the iron which goes over the expansion joints? No.

16017. Then the iron in the expansion joints appears in item No. 3 in your memorandum No. 5? Yes.

16018. What do the expansion joints include? The bolts and the fitting in connection with them.

16019. And the mastic? The whole joint.

16020. Why did you take off 28 $\frac{1}{2}$  per cent. from these three items—bluestone concrete in piers, sandstone concrete in piers, and cement facings, 2 to 1? Because I regard the schedule rates as being the value of the work arrived at in open competition, and I say that you cannot get nearer to the value of the work than that.

16021. Take the item of 12,190 cubic feet of freestone ashlar at 3s. 6d.; you could not afford to take 28 $\frac{1}{2}$  per cent. off that price? The contractors undertook to do the work for 28 $\frac{1}{2}$  per cent. below that rate, and M'Sweeney and the other contractors backed them up, so that they must be right.

16022. The difference between Mr. Gilliver's schedule and the schedule of this contract in the items for excavation is excessive? You must take every contract by itself. There were circumstances in connection with No. 77 which did not occur in the next contract, No 117. There were circumstances, on the other hand, in No 117 which did not occur in No. 77. To arrive at one price for the whole of the excavation in the two works, because they happen to adjoin, would be folly.

16023. But they go through the same country;—the same sort of sandstone occurs in Contract 77 that occurs in Contract 117? Not necessarily.

16024. It is the same sandstone exactly, is it not, through both contracts? It is sandstone, but sandstone varies. In one case the excavation is put down at 28s., and in the other case at 60s., 57s. 6d., and 65s.

16025. Those are excessive prices, are they not? I think that if you take the two contracts, and deduct the percentage which appears in each case from the schedule rates, you will get at the relative value of the two works.

16026. But, as a matter of fact, 3s. 6d. for the ashlar is a very fair price, without taking 28 $\frac{1}{2}$  per cent. off? The office thought that 3s. 6d. was a fair price. That was Mr. Bagge's idea of the value of the work. The contractors disagreed with him to the extent of 28 $\frac{1}{2}$  per cent, Mr. M'Sweeney to the extent of 25 $\frac{1}{2}$  per cent, and so on, until you arrive at some contractors who did agree with him.

16027. The contractors do not take 28 $\frac{1}{2}$  per cent. off each item when they are drawing up their schedules—for instance, they take 20 per cent. off one item, 50 per cent. off another, and then strike a balance? I do not know what they do; it may be so.

16028. But do you not know that that is so, as a matter of fact? I have nothing to do with the contractors in that way.

16029. Coming to your memorandum No. 6, you have made a calculation in connection with Contract 79 as to the difference between guttering and gadding and blasting, as if there were an intention to do either guttering and gadding or blasting right through the contract,—have you not? I have made a calculation on the facts.

16030. But you have made it on the assumption that you were going to do the whole of the work, either by guttering and gadding, or blasting? That would be the case. My original proposal was to do the whole of the tunneling by means of guttering and gadding. We should have done the whole of the tunneling ordinarily with 4-in. charges.

16031. But the calculation you have made is that you might do the whole of the work either by guttering and gadding or by blasting? I have based the statement in my memorandum No. 6 on my minute relating to that matter.

16032. Lower down in your memorandum you say "When the whole of the work was finished, including the small extension at Ernest-street, which cost £1,220, another at the outfall, Long Bay, and some work in connection with the reticulation at Maclean-street, the total cost of the contract amounted to £40,023 10s. 3d. The amount of the tender for Contract 79 alone was £39,890. It will, therefore, be seen that there was a considerable saving upon the contract." What amount was there which was charged to Long Bay? The papers show that it was a small matter at the outlet. You will see, I think, that the amount was £120.

16033. Then how much was charged to Maclean-street? I do not think I could tell you that. It was a manhole, a short drive, and a short piece of reticulation. It was to make facilities for connecting the reticulation with the deeper shaft at that point—that is at the foot of Maclean-street, in Alfred-street. In Alfred-street there is a high and low level road, the reticulation had to be brought down from the high level to the low level, where the shaft in the main sewer was.

16034. How much would that cost roughly? I do not know: Perhaps as much as £150. It may have been £200, but I do not quite know the amount.

16035. Why are these amounts charged to a large contract like No. 79? Because they had to be done in connection with the contract.

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16036. *Mr. Smith.*] I think that when you were examined this morning in reference to this minute of Mr. Hickson's, upon page 125 of the Parliamentary Return, as to Contract 69, you said you had no doubt that the interview with the contractors had taken place before that minute was written and after the writing of your own minute? Yes.

16037. I think you said you had no doubt that Mr. Hickson wrote his minute on the spot as it were, just after seeing the contractors, and that that was his custom in dealing with such matters? Yes.

16038. If you look at the minute you will see that Mr. Hickson expresses himself in this way, "We cannot in fairness omit an item for which no doubt the price is absurdly high," &c.? Yes.

16039. Seeing that, do you not think it likely that he said as much at all events to the contractors? Yes, I am sure of that. But when I was asked the question by His Honor I stated what was practically the case. He did mention to me at the time the absurdly high price. He said that the time to complain of it, however, had passed, and that what we then had to do was to deal with the facts as they stood.

16040. On Friday last you were examined as to the preparation of the papers for Parliament, and something was then said about your exercising your discretion. I suppose that what you mean is that you understood that you were to substantially comply with the requirements of Parliament, but that you were to exercise a reasonable discretion in the selection of the papers? Yes.

16041. That is the usual practice? Yes.

16042. In the exercise of that reasonable discretion you did not consider that plans were papers within the meaning of the order? No; I have already pointed that out. At the beginning of my evidence to-day I said that Mr. Young said as much in Parliament.

16043. Mr. Young was of the same opinion himself, and pointed it out to the House? Yes.

16044. In fact I think the complaint of Mr. Parkes, among other things, was that too much matter had been printed? He seemed to think that we had not exercised our discretion sufficiently.

16045. With regard to the payments upon Contract 72, you were asked on Friday last where the money came from to make up the amount of £17,000 represented by the vouchers of January and February, 1892. You said in reply to question 15751, that you would have to look up the vouchers before you could say where all the payments referred to by Mr. Parkes came from. There can be no doubt, I suppose, but that they were all passed by the Auditor-General? They were all passed by the Auditor-General, and if you take my answer to Mr. Parkes' question 15756 you will see that it appears to have been given after he had handed to me the vouchers. I then said that the amount was paid from two votes, viz., £15,500 and £8,500, those two votes being for the work in question.

16046. But all the payments were passed by the Auditor-General? Certainly.

16047. At question 15806, reference is made to two clauses of the specification, one being the 5th section of clause 4, and the other special clause 3? Yes.

16048. As to the first one it is a general clause dealing with the omission of works? Yes.

16049. The other one deals, as it appears, with the suspension of a particular part of the work? The suspension or omission of the 13 and 27 chains of the lower portion of the channel.

16050. With the suspension or omission of that particular portion? Yes.

16051. You said in reply to question 15809, as to whether there was any chance of a man signing that contract having any claim, that there would be no chance whatever if the clause were put into operation with regard to the 13 and 27 chains? Yes.

16052. But the doubt was, although there were general words in the clause, whether it would enable you to stop other portions of the work? Quite so. Inasmuch as it was necessary in the opinion of the Department to specifically mention the 13 and 27 chains, it was admitted that the general clause would not be sufficient to eliminate a matter of perhaps 20 to 30 chains of the upper portion of the sewer.

16053. So that, although Mr. Hickson gave notice to the contractors of his intention to suspend or stop the portion of the work included in that clause, the Department felt they were not on sure ground at all? No; admittedly so, from the wording of the third clause of the specification.

16054. In answer to that clause put forward by Mr. Hickson and the statement that he could take action under that clause, you had the contractors' answer after taking the opinion of Mr. B. C. Simpson? Yes.

16055. You considered when you had that answer that you were not at all on safe ground in relying on that clause only? Yes.

16056. And for that reason you came to the conclusion that there was a claim which might be substantiated if it went to law? Yes, certainly; it is not the practice of the Department to rely upon that general clause in the cutting out of any large portion of the contract.

16057. *Mr. Gummow.*] As to the bluestone pitchers out at Marrickville, what was the quantity which you say was shown on the plans to be paid for? 32 square yards.

16058. How many were paid for? 35 square yards.

16059. A difference of 3 yards? Yes.

16060. Were you not satisfied that there were 35 square yards shown on the plan? No; only 32 were shown on the plans as they originally left the office.

16061. I mean on any plans that were sent in from the office—I do not mean the original signed plans? I am speaking of the signed plans. It was those plans upon which Mr. Hickson wrote his minute.

16062. But if the Department afterwards sent out plans showing a certain number of bluestone pitchers would not that go to show that that work was required to be done? I am not aware that such plans were sent out.

16063. But if they were, would it not show that the work was to be done? I am not aware that the plans were sent.

16064. You are satisfied in your own mind that only 32 square yards were shown on the plan? I am. I looked the matter up at the time, because it is an important question. I had looked it up since the Commission has been sitting, and I still say that when Mr. Hickson gave his decision the whole of the manhole covers were not shown to be fixed.

16065. In considering this question with Mr. Hickson, did you go into the price which the contractors had for timber? Yes. He said that, while this particular price was absurdly high, there were others equally low or at any rate very low.

16066. Do you know that, on any contracts let by the Sewerage Department, advances had been made on plant and material? Advances were made on material in all contracts where the contractors make application and where the Department could reasonably meet them.

16067.

16067. I am referring now to the Bondi and to the Double Bay and Rushcutter Bay contracts;—was any advance made on plant and material in those cases? Yes, on both.
16068. Was that plant and material necessarily on Government ground when the advances were made? Every care was taken in those days that, unless the contractors handed in a lease of private ground to the Department, the plant and material were on Government ground.
16069. Was any greater care taken then than has been taken latterly as regards advances on materials? No; when we advance now, the utmost care is taken to see that there is proper control over the stuff, whether it be plant or material.
16070. Who was the Engineer-in-Chief at the time that these former advances were made? Mr. Bennett.
16071. *Mr. Parkes.*] In connection with Contract 72, the claim that Carter, Gummow, & Co. put in was not for suspension, but was for loss, by withdrawal of the contract? I said on Friday that to begin with it was an omission, and it then resolved itself into a suspension, because the work was gone on with. Notice was given to Carter, Gummow, & Co. that a certain portion of the contract would be omitted.
16072. But they claimed on certain items for withdrawal? Yes.
16073. The items were—Rent of Knight's paddock, £10; sandstone for concrete, broken and stacked, £400; Portland cement, £958 15s.; loss on sale of Portland cement, £250; gratings, £87 10s.; manhole covers, £30; interest on expenditure, £64 4s. 6d.; valuation of plant on ground for completion of contract, £500; loss of profit on work withdrawn, £1,750;—is there one item there that did not disappear when the contract was continued? I would say this, that the claim would have to be put in a different form, supposing a claim to have been made. That claim was made on the supposition that the portion of the contract referred to in Mr. Hickson's letter of October was to be omitted. If Messrs. Carter & Co. had made a claim for suspension, they must have based their claim on totally different grounds, and therefore there would be different details.
16074. Where is their claim for suspension? There is no claim; there is nothing except the broad fact that they would have had a claim under the general conditions for the six months' suspension.
16075. You say that the channel that was cut down, Shea's Creek, was in the original contract? I say that it was shown on the original contract drawings.
16076. And did you take off a certain amount so as to prevent the work from going to the Public Works Committee? I have already stated what I know about that; I did nothing of the kind.
16077. But was that not done? What I say is, that Mr. Bruce Smith, the Secretary for Public Works at the time, ruled that the contract was to be reduced to the extent of £3,000, seeing that the tender amounted to £20,640 at schedule rates.

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Charles Clymer sworn and examined:—

16078. *Mr. Davis.*] What is your position? I am inspector in the Sewerage Department.
16079. How long have you been in the Department? Over six years.
16080. What was the first job you went upon after joining the Department? The first job I went upon was the Alexandria Park stormwater sewer.
16081. Were you on that contract from the beginning to the end of it? Yes.
16082. Did you see all the concrete mixed? Yes.
16083. Did you see all the cement brought on to the ground? Yes.
16084. Can you say whether the whole of the cement brought on to the ground and put into the work was approved cement? Yes; no other cement was put in. I was notified of all the cement as it passed, and I know that it was used in the work.
16085. You saw every gauging of concrete mixed? Yes.
16086. Can you swear positively that the specified quantity of cement was used upon the work? Yes.
16087. Coming to the question of the thickness of concrete, you have seen the contract drawings? Yes; I had them before me for my guidance.
16088. You had also a copy of the specification? Yes.
16089. Did you see that the thickness of bluestone concrete shown upon the contract drawing was put in in every instance? Yes; I saw it all put in. I was very careful of that. I believe that the whole of the 9 inches was put in. We went as near as we could get. There may have been 8½ inches in some cases, but then in other cases there would be 10 inches. The average was fully 9 inches. I do not think that in any instance there can have been much less than 9 inches, and in many cases I am satisfied that there was more.
16090. What kind of bottom was it? It was a very bad bottom. As nearly as I can remember, at the distance of from 2 to 3 chains from the outfall it was all slurry, and from there to where the work joined the old Corporation sewer there was very good clean sand.
16091. The lower end of the channel being in very bad ground it is probable that the concrete there would sink into the ground to some extent before it got its proper bearing? Yes; it is highly probable that it would sink an inch or 2 inches in the ground. We had to be very careful in putting down the concrete there. We had boards for the men to stand upon when they were putting the concrete on the soft ground; but in spite of all the precautions we took, I have no doubt that a good deal of it would sink into the soft bottom.
16092. You are prepared to say that the contract, to the best of your knowledge, was carried out in accordance with the contract drawings, and the specification attached to the contract? Yes.
16093. Coming now to the question of cement returns, will you explain to His Honor what your practice is in making returns of the quantities of cement that are issued daily upon any contract of which you have had charge? The practice is to return the number of casks of cement issued during the day. In order to arrive at that, we usually take the number of casks brought down by the drays on to the board. These are counted up, and if any are left they are subtracted from the total. The balance is given as the quantity used during the day. This return is made as nearly correct as we can possibly get it. I do not know of any other way which would be more accurate.
16094. Have you compared the quantity which you know to have been in store in the shed with the quantity that you issued from day to day, deducting the latter from the former, and in that way checking yourself?

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- C. Clymer. yourself? It is a usual thing to have that done once a month, but I used to do it continually for my own information. I used to go over the thing, and arrive at an approximate idea of the quantity of cement in the shed. Once a month we had to show the resident engineer, when he was making up his certificate, exactly what had been done during the month, that is to say, exactly how many casks had come on to the work, how many had been used, and what the balance was.
- 7 Sept., 1896. 16095. So that the returns you make to the head office from time to time—now daily, but formerly weekly, and then again daily—are fairly accurate;—they represent generally the quantity of cement used in the work? Yes.
16096. You have no difficulty in swearing to that? Not the slightest.
16097. While your returns are not precise to a few casks, still they fairly represent the quantity of cement used in the work? They fairly represent that. It is possible that a mistake of from one to half a dozen casks may be made, but there would be no considerable error.
16098. Recently you have been in charge of Contract 77? Yes. I have been in charge of the aqueduct from the date of its commencement up to the present time.
16099. You had charge of the sandstone concrete in the piers? Yes; everything in connection with that.
16100. And of the concrete on the top of the piers? Yes.
16101. And also the Monier structure? Yes.
16102. What have you to say as to the quality of the sandstone concrete in the piers? It is the usual thing—5, 2, and 1.
16103. What about the quality of the stone? I consider that it is first-class.
16104. How many years experience have you had of freestone from the vicinity of Balmain? About thirty years, I suppose.
16105. And you would say, upon the strength of that experience, that you know good stone from bad stone? Yes. I do not think there is any kind of building material in regard to which I could not say whether it was good or bad.
16106. Would you say that the stone used in the sandstone concrete upon No. 77 was good sandstone, and that it complied with the specification attached to the contract? Yes; I consider that it would fully comply with the specification. The stone which we got out of the tunnelling would more than comply with it.
16107. What sand is being used on Contract 77? We are getting sand from two places at North Sydney—from Neutral Bay quarry and from the Gas Works quarry.
16108. That sand you know has been tested? A good many times.
16109. Quite apart from the testing of it, as an old builder who knows something about sand, what is your opinion of this sand compared with the Nepean sand? I should prefer it to the Nepean sand for some purposes. My experience of the Nepean sand is that for tensile strength it does not come up to good crushed sandstone. The Nepean sand is principally waterworn. The particles are round, and I consider that a round body mixed with cement will not give you the same bond which you would get from a body with sharp corners, say a hexagon or octagon shape. I consider that sand of that description would be much better in tensile strength than Nepean sand.
16110. Do you consider that the sand which has been used on Contract 77 has been clean—that it has been free from foreign matter? Yes.
16111. You have been upon Contract 77 from its commencement up to the present time? Yes.
16112. You have seen every centre erected? Yes.
16113. And you have seen the centres taken down? Yes.
16114. You have seen the grilling put in position? Yes.
16115. And you have seen the compo. or concrete, as the case might be, put in position? Yes.
16116. You have kept the time that has been put in upon these different kinds of work? Yes.
16117. Will you tell His Honor, calculating that a labourer would receive 7s. a day and a foreman from 9s. to 13s., or whatever it may be, what the cost of a length of the structure has been, taking a length, for instance, from the centre of one pier to the centre of the next pier—82 ft. 10 in.? Yes. I made a few notes as to that. They are as follows:—

ESTIMATED COST of labour in one complete span of 82-ft. 10-in. arch, Monier design.

|   | £   | s. | d. |
|---|-----|----|----|
| <i>1. Concrete and Compo.</i>   |     |    |    |
| To place compo. in main arch takes 11 men at 7s. and 1 man at 9s., a day .....                | 4   | 6  | 0  |
| To place concrete in spandrel arches, and piers, 11 men at 7s., 1 man at 9s., 2½ days ..      | 10  | 15 | 0  |
| To place concrete in main carrier, 11 men at 7s. and 3 men at 9s. per day, 1 day.....         | 5   | 4  | 0  |
| To place concrete in cover-plates, main arch (28), 4 men at 7s., 1 day .....                  | 1   | 8  | 0  |
| <i>2. Ironwork.</i>   |     |    |    |
| To fix grilling in main arch takes 6 men at 7s., 1 man at 10s., and 1 man at 12s., 1 day...   | 3   | 4  | 0  |
| To fix grilling in jack arches, 3 men at 7s. per day, 2 days.....                             | 2   | 2  | 0  |
| To fix grilling in main carrier, 4 men at 7s. per day, 2 days .....                           | 2   | 16 | 0  |
| <i>3. Timber.</i>   |     |    |    |
| To fix spandrel piers, boxes, and arch centerings, &c., 2 men at 9s. and 2 men at 7s., 4 days | 6   | 8  | 0  |
| To fix main carrier casings, 2 men at 9s., 1 man at 7s., 1 week.....                          | 8   | 15 | 0  |
| To remove the above, 1 man at 9s. and 1 man at 7s., 2 days.....                               | 1   | 12 | 0  |
| To fix main arch trestles, 12 men at 7s. and 1 at 9s., 1 day .....                            | 4   | 13 | 0  |
| To fix main arch laggings, 12 men at 7s. and 1 at 9s., 1 day .....                            | 4   | 13 | 0  |
| To fix main arch side boxing, 2 men at 9s., 1 man at 7s., 1 day .....                         | 1   | 5  | 0  |
| Taking down large centerings, 12 men at 7s., 1 at 9s., 1 day.....                             | 4   | 13 | 0  |
| Carrying odds and ends to next bay, 2 men at 7s., 1 day .....                                 | 0   | 14 | 0  |
| To erecting and removing scaffolding, 4 men at 7s. per day, 1 day .....                       | 1   | 8  | 0  |
|   | £63 | 16 | 0  |

CHAS. CLYMER, Inspector, Contract 77.

Small

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| <i>Small arches at ends of aqueduct.</i>                  |       | £ s. d. |
|---|-------|---------|
| To place concrete in six spandril arches (as before)..... |       | 10 15 0 |
| To fix grilling in six spandril arches (as before) .....  |       | 2 2 0   |
| To fix timber in six spandril arches (as before) .....    |       | 6 8 0   |
|   |       | -----   |
| Labour in six small arches .....                          |       | £19 5 0 |
| Labour in one small arch .....                            | (say) | £3 4 0  |

| <i>Labour in 82 ft. 10 in. lineal feet of carrier.</i>    |  | £ s. d.  |
|---|--|----------|
| To place concrete in one span of carrier (as before)..... |  | 5 4 0    |
| To place concrete in cover plate (as before) .....        |  | 1 8 0    |
| To fix grilling in carrier—one span (as before).....      |  | 2 16 0   |
| To fix timber for carrier boxing (as before) .....        |  | 8 15 0   |
| To removing timber boxing (as before) .....               |  | 1 12 0   |
|   |  | -----    |
| Labour in carrier per 82 ft. 10 in.....                   |  | £19 15 0 |

CHAS. CLYMER, Inspector, Contract 77.

16118. Take the work at the end of the aqueducts—the forty-two small end arches—what do you say has been the cost of the labour per arch? The labour in one arch would be equal to £3 4s.

16119. Then taking the carrier over the arches—what has been the cost of that as regards labour, taking the length of 82 ft. 10 in.? Nineteen pounds fifteen shillings.

16120. You are quite sure about the return? I am quite sure of it. I take a lot of notice of things of this sort. I am an old contractor, and I like to have the information for my own use. I may one day become a contractor again. I have made a number of notes from which I have taken out these figures. I have taken particular care, as it happens, in obtaining the information, although I did not expect to be called upon to give it to the Commission. I think the statements I have made as to the value of the labour are pretty accurate.

16121. Did you use any bag cement upon Contract 77? No.

16122. Do you know whether any bag cement was used upon Contract 118? Yes; I believe it was.

16123. Do you know of anything which occurred in connection with the bag cement on Contract 118? I only know this: that on one occasion Mr. Forrest asked me to let him have a few casks from off my job, as some of his bags in the shed were burst, and it was a difficult matter to carry the burst bags down to the board without wasting the cement. It is an understood thing that we have to see the casks destroyed, but I said that under the circumstances I had no objection to his taking a few casks into which to empty the contents of the burst bags, so that the cement might be carried to the concrete board without waste.

16124–25. The casks which you allowed to be taken up to the cement-shed were as far as you know used in that way? Yes. There were two lots of bag cement there—one which did not pass the required test and the other which did. The bags which they were using had passed the test. A good part of the other cement is in the shed now. Some of the bags of that cement were also broken, and they got a few casks to send some of it away to Sydney,—to the Post Office tunnel work I understood.

16126. *His Honor.*] They got a few casks into which to put some broken bags? Yes.

16127. *Mr. Parkes.*] Did Mr. Davis ask you to come here to give evidence? No.

16128. Did you come of your own free will? Yes.

16129. You had no communication with him before you came here? Yes.

16130. How did you come to have it? He sent out a messenger to say that I was to be examined here, and that I was to be prepared to report fully upon the whole of the work.

16131. Did you send him a report as to what your evidence would be? No. I was summoned on Friday last, and I was talking to Mr. Adams.

16132. Is Mr. Adams making up any calculations? I do not know.

16133. Did you give him your particulars? No.

16134. Did you give him any particulars? I gave him some particulars on the job. He helped me to measure some of the timber in order to check my estimates.

16135. You, some time ago, told Mr. Davis about the casks which you gave to Contractor Forrest into which to put the bags of cement? Yes. I was called upon to report about it. I did not tell Mr. Davis personally; I had to send in a report about the matter, because I had no business in the ordinary way to give the casks. Ordinarily, the casks are supposed to be destroyed.

16136. Were you threatened at all? No. But it is provided in the specifications that the inspector-in-charge shall see that all the casks are destroyed.

16137. You have spoken of there being bad cement upon Contract 118. On 20th September, 1895, Mr. Roberts, the cement tester for the Department, tested 700 bags. He afterwards tested 1,360 bags, which were condemned; and we then come from the 20th September, 1895, to the 12th February, 1896, when there were 500 casks of cement purchased for that job. Between that time there were 2,000 casks of cement sent on to the job? Very likely.

16138. Where was the bag cement? In the shed.

16139. Were not the 700 bags used between the 20th September, 1895, and the 27th September, 1895? Really, I could not tell you.

16140. You are sure it was not used? I could not tell you.

16141. Where do the 1,360 bags come in? That I could not tell you. I am not sure.

16142. Then you do not know, after all, whether there was passed or rejected cement in the shed? Of course I know, by seeing it there. There is a large portion of rejected cement there now.

16143. Where is this passed cement? It has been used, I suppose.

16144. Where was it used? I could not tell you.

16145. It would be used immediately after it was obtained, would it not? I could not say that; I do not think so. You might go on with a bit of concreting perhaps for a week, or perhaps for a day.

16146. Do you recollect 2,000 casks coming in? I have no idea as to that. I was upon Contract 77. Another inspector was in charge of No. 118. The cement for Contracts 77 and 118 was all stacked in the same shed, so that I had not absolute control over the whole of the cement which was in the shed.

16147. What was the name of the other inspector? Lockhead.

16148.



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16148. Would he have more control than you had? He would have more control than I had as regards Contract 118. I had nothing to do with Contract 118.
16149. Then you do not know whether condemned or passed cement went into that work? I have some idea, because I was going backwards and forwards continually, and one does not go about with one's eyes shut.
16150. Is the bag cement marked to show that it has been passed? No; you cannot mark bag cement. Cask cement, of course, will have the brand upon it. Most of the cask cement is branded before it comes on to the job.
16151. Why do you say "most";—does any come on to the job without the Government brand? Yes; there are 600 casks on the job now with no brand upon them.
16152. Why is it not branded? Because in a case of that kind I have to open two casks in every 100. Three samples are taken out of each cask; these are sent in to the office to be tested; if they pass the test required by the department I am notified. I am notified that it can be used upon the contract. It comes to the same thing.
16153. *Mr. Davis.*] You do not brand cement which is passed on the job? No.
16154. That is never branded? No.
16155. It is only that which is passed in warehouses or in bond that is branded? That is all.
16156. Do all the inspectors follow the same course that you do in sending in returns? Yes.
16157. When cement comes on to the job branded, from bond or a warehouse, do you send a return into the Department as to the quantity of cement you have there? Yes; the delivery notes for the cement are made up in triplicate. The man who does the branding has a book, and he fills in three delivery notes. Supposing twenty-five casks were going out to a job of Carter & Co.'s at Leichhardt, or wherever it may be, two of the delivery notes come on to the job; the contractor holds one, and I hold the other. The Resident Engineer would require me not only to note in my report that I had received the casks on a certain day, but he requires me at the end of the week to give him the delivery note, so that I am thoroughly checked in that way. That is the system adopted when any cement comes on to the ground ready branded.
16158. So there is no doubt about your returns being correct? I do not think so.
16159. *His Honor.*] Do you remember a man named Thomas Wright working on Contract 61? Yes.
16160. Do you know the man well? I cannot say that I did. He was not there constantly. He was there only a day or a day and a half at a time when he happened to be wanted.
16161. What was his work? He was a carpenter. The principal work he did was towards the outfall of the sewer. He fixed a few sets of ribs for perhaps 40 or 50 feet of sewer. He got these ready, and in the case of the last two lengths I asked him to nail the lagging on them, because I wanted to make a nice job of the barrel sewer. That would be the longest period he would be there at one time; and I suppose that would be about two days.
16162. Was he in the sewer itself, or was he working on the outside of the sewer? He never was inside the sewer. He was not there at all after the invert was built up to the springing. The ganger Allen would do the other half of the work.
16163. Wright, you say, had the fixing of the ribs? A portion of them near the outlet. He may have had about a chain to do. Wright was also there when there was a little technical work to be done in making the junction between the barrel and the main sewer.
16164. Was any mistake made in the levels near the outlet—that is, in the levels of the invert or the levels of the centres? Not that I know of.
16165. Did you ever hear of the pegs being found not to be true? No; I was very careful in having the pegs put in, and the Resident Engineer checked what I did.
16166. The bottom was very shaky? Yes.
16167. The bed at the outlet was slurry? Yes. There were some holes there in which the Chinamen had been in the habit of mixing their manure. Some of these were from 7 feet to 8 feet deep. We had to bail these out, and fill them in with sand and ballast before we could do anything at all.
16168. Were the pegs to show the level of the invert driven into the bed of the creek or gutter? They gave us a centre line of pegs. We know how far we are to excavate the ground, and the pegs help us to keep a true line. When we get down as nearly as we can to the correct depth the engineer will come along and will have pats of concrete put in for levels, and will give us the true centre line again.
16169. After that is it possible, in that shaky ground, for the level to change itself by sinking or rising? No; some of the pats took half a truck of concrete.
16170. Wright has sworn that something took place which resulted in a mistake in the levels in the bottom of the sewer, with the result that the concrete was finally put in from 3 to 6 inches in depth instead of 9 inches in depth;—what would you say as to that? I should say that he was wrong.
16171. Supposing he made a mistake in reference to that matter, can you explain his having got that idea into his head from anything which did take place? No. I cannot think of anything which would cause a sensible man to make an assertion of that kind. It would be no trouble to me to have the correct thing done, and I should not be likely to let a mistake of that sort pass. It was an open cutting. The work would all be done in daylight, and it is not at all likely that a mistake of that sort would occur.
16172. Such a mistake as that would not be likely to occur unless the inspectors were away altogether? I do not see myself how it could possibly be made.
16173. *Mr. Davis.*] Did you see any bag cement used upon Contract 77? No.
16174. What you said as to bag cement in answer to Mr. Parkes applied more especially to Contract 118? Yes; it was used upon Contract 118.
16175. *Mr. Gummow*] You had nothing to do with Contract 118, and what you state would be merely what you saw in walking over Contract 77? Yes; I had nothing at all to do with Contract 118.
16176. You know nothing officially as to what occurred on that contract? No.
16177. Do you know where the ribs for the Alexandria Park sewer were made? No; they were not made on the ground.
16178. The carpenters were not on the ground while they were making the ribs? No; no ribs were made on the ground.

WEDNESDAY, 9 SEPTEMBER, 1896.

Thomas Griffiths recalled and further examined:—

16179. *Mr. Davis.*] The witness Benson was asked by Mr. Parkes, Question 157, to describe to His Honor the nature of the work in a flushing-pipe on the Illawarra Road, and he said:—"I was connecting a 20-inch water-main. I had to join the two ends and to caulk them with lead. It was a water-supply pipe intended to flush out the sewer. The distance apart of the two ends upon which I had to fix the collar was too great. Sufficient length of pipe had not been allowed to permit of the two pipes coming properly into the collar. The collar barely covered them three-fourths of an inch on each side, whereas there should be 6 inches on each side if the caulking is to be properly done. You have to caulk with spun yarn first, and then run in your lead." You were in charge of Contract 69 at the time this work was done. What have you to say as to that? First of all, it was not a water-pipe; it was a sewer scour-pipe. It was a scour-pipe from the outlet of the siphon. The pipe was cut shorter than it was customary to cut it. At the same time, when the thimble was put over we had  $2\frac{1}{2}$  inches on each side for the lead. I have had prepared a sketch showing the nature of the work.

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16180. *His Honor.*] There were  $2\frac{1}{2}$  inches on each side you say? Yes.

16181. *Mr. Davis.*] In view of the fact that you had  $2\frac{1}{2}$  inches of joint, and, in addition to that, the whole pipe was surrounded by concrete, and, furthermore, that the pipe had to stand little or no pressure, that at the very worst it would have a head of from 2 to 3 feet only, would you say that although the pipes did not come together it was a fair job? I say that it was a very good job. It might have been better, certainly; but it was quite good enough for anything of the kind. The pipe is not under pressure at all, and it discharged into a sewer with a considerably larger diameter.

16182. Benson went on to speak about a flange joint at the same place underneath the concrete in which the bolts were not long enough. Mr. Parkes asked him, at Question 158, how far beyond the collar that would be, and he said:—"About 8 or 9 feet. Some of the bolts had only two threads for the nut, some three threads, and some only half a thread. In some cases the bolts would not go through at all. The bolts are supposed to go right through the joint, and the nut is screwed on the outside. We would hardly get a grip at all with some of the nuts." Do you know where that joint is? Yes; it is about 8 feet from the thimble, as stated by Benson. There are fifteen bolts in the flange, as you will see from the sketch, and the joint was tightly bolted up. The bolts were long enough, but on account of one or two of them being, I understood, of slightly less diameter it was decided to run in an additional lead joint—not that it was required at all. It is in the same line of pipe. The piping is under no pressure at all, and it has an additional cover of 8 feet of concrete. It is also surrounded by concrete.

16183. So that that flange joint would be considered a good job? I should certainly say so.

16184. Do you anticipate any evil results from the work as carried out according to the plan you have produced? I should think not.

16185. *His Honor.*] It is sandstone concrete? Yes; the bottom part of it.

16186. *Mr. Davis.*] At question 2183 a witness named Darcus, speaking of the siphon on the Illawarra Road, said, among other things:—"The pipes were put in much below the penstock chamber; my duty was to build this chamber, and when I came to put in the chamber I found that the pipes were out of the line of the main sewer. I had then to build the thing up as best I could. We had to bend the main sewer round so that it would come in." At question 2189 His Honor said, "What amount of deflection would there be?" and the witness said, "I suppose there would be about a foot." You know the inlet and outlet of the siphon on the Illawarra Road;—will you explain what took place? The sketch I produce shows a horizontal section of the outlet chamber of the siphon. At the point of intersection, the two centre lines—one of the siphon and the other of the outlet end of the sewer—form an angle at this manhole. The line is practically straight, the angle being  $179^{\circ} 16'$ . The thing was so nearly dead straight that it was forgotten that it was not actually straight, so they set out the line of the side of the manhole at right angles to the siphon line, which of course threw out the other side a matter of a few decimals of an inch. The two sides are built parallel, but on account of one line being on a different plane from the other the one is thrown out somewhat. The casting had to be fixed to meet the altered conditions.

16187. *His Honor.*] They ought not to have been parallel, in point of fact? No. The diameter of the penstock pipe is 3 ft. 9 in., and the size of the sewer at that point is 4 ft. 2 in. x 5 ft. 2 in.

16188. It was the 44 minutes in the angle that was forgotten? Yes; the angle, instead of being in the manhole, is now somewhat inside the sewer. While the diameter of the penstock is 3 ft. 9 in., the size of the sewer is 4 ft. 2 in. x 5 ft. 2 in., so that we had plenty to come and go upon. The biggest mistake that possibly could be made would be only a matter of  $2\frac{3}{4}$  inches. The casting would not be in the sewer at all if there had been a mistake of a foot. I do not think, as a matter of fact, that the mistake amounted to more than three-fourths of an inch. It is imperceptible as you walk along the sewer.

16189. *Mr. Davis.*] So that, instead of the angle being in the outlet well as shown on the contract drawing, it is about 10 feet inside the sewer that discharges into the outlet leading into the siphon? Yes.

16190. And that would cause the casting to be slightly out of line with the sewer beyond the length given? Yes.

16191. As a matter of fact, does it make any practical difference? It cannot.

16192. Would it be possible for you to discover the mistake if you were there? You could not discover it by a casual examination. Unless you knew of the existence of the mistake, if you like to call it a mistake, you could not discover it.

16193. It was imperative that the casting should be at right angles to the axis of the chamber as the penstock would not work otherwise, and that is the reason that it was put in in the way it was? Exactly.

16194. *His Honor.*] Originally the idea was to vary the form of the chamber. Instead of making it rectangular, it would be 44 minutes out? Yes.

16195. *Mr. Davis.*] You prepared the Schedule for Contract 77, which has been put in evidence, upon which moneys were advanced as payments during the progress of the work. In that Schedule you put down 70s. as the value of the Monier structure apart altogether from the ironwork. You put down in addition to the 70s. per cubic yard for the compo. work another price for the ironwork. Now that the work is practically brought to a conclusion, have you any reason to alter the opinion you formed practically before the work was commenced? I think that is a very fair price.

16196. You think subsequent events have proved to you that you were right when you decided upon 70s. apart from the ironwork? Yes.

16197.

- T. Griffiths. 16197. You have had some experience in the use of crushed sandstone as sand in addition to that which you have gained during the time you have been connected with the Sewerage Department? Yes; it is frequently used at home.
- 9 Sept., 1896. 16198. Will you tell His Honor your experience and opinion in regard to it? I think I have referred in my previous evidence to the Cardiff Water-works. That is one of the latest examples of water-works of a large character in the old country. Crushed sandstone was used in that work. Then the storage reservoirs and filter beds at Llenishen were also built of crushed sandstone.
16199. *His Honor.*] You mean that crushed sandstone was used in making the concrete? Exactly.
16200. *Mr. Davis.*] It shows beyond doubt what is thought of that class of sand? Yes; it is always considered a better class of work, that is, concrete made with that sand.
16201. You have had a good deal of experience in concrete mixing? Yes.
16202. Speaking generally as to the bulk which a given quantity of cement will make, what would you say;—would you say that it would be difficult to determine what it would make unless the precise circumstances were known? It is a variable quantity; you can never determine it exactly. Acting for the Board we allow a certain quantity for bluestone, and a certain quantity for sandstone, per cask. You have not only to know the average size of the stone but you have also to consider where the concrete has to be placed. You also have to consider the quantity of water which is used. There are several things to be considered.
16203. So that as regards the size of the stone, supposing it varied from  $\frac{1}{8}$  of an inch—taking the bluestone—to  $1\frac{1}{2}$  inch, that would be very favourable to the quantity which a cask of cement would make? Yes.
16204. And the same thing would apply to sandstone? Yes.
16205. And as to the quantity of water put into the concrete, that would also make a difference? Certainly.
16206. *His Honor.*] How would that affect it? In making compo., as long as you damp it you can compress the compo., but in making concrete the more water you add the more bulk you make.
16207. It crystallises afterwards, making really a different body from that which you would have in the case of crystallisation taking place from less water? Yes.
16208. There would be more equivalents of crystallised water? Yes. I also forgot to mention that it depends a great deal upon whether your concrete is enclosed in timber casing. That makes a lot of difference. For instance, in the case of the Sewerage Board we place all the bluestone concrete in wooden framing. The manholes are built conical. The walls are built inside a wooden frame. So you might say you get the exact size in that case, whereas if you come up against a rock surface, such as the rock on the side of the excavation, you would not get the exact quantity.
16209. You mean you would not be able to calculate the exact quantity? Yes; showing the difficulty of estimating how far a given quantity would go in the work.
16210. *Mr. Davis.*] Take the case where you are putting concrete in a situation where you have to ram it vertically and another case where you have to ram it horizontally, would that make any difference? That is just what I have been referring to. It depends, as I say, upon the part of the work into which the concrete has to go. I had in my mind just now what you are now asking me. If you were ramming vertically you could get the material much closer together than if you were packing it horizontally.
16211. Take a tunnel for instance;—would you say from your experience that there is any special difficulty in getting the concrete tight over the brickwork or otherwise? That is about the worst position in which you can put it in. You cannot get it quite tight. There are certain places which you will find that you cannot reach. For instance, you could not get a 2-inch gauge through a space only half an inch in width.
16212. So that concrete will go further in tunnel packing than if you were putting it between boards in the case of a pier? That is obvious.
16213. In the case of the Sewerage Board you have the same specification as to mixing that we have in the Sewerage Construction? Yes; 5, 2, and 1 in the case of the sandstone concrete, and 4, 2, and 1 in the case of the bluestone concrete.
16214. And the same sized stone? Yes; 2 inches for sandstone and  $1\frac{1}{2}$  inch for bluestone.
16215. The only difference is that you specify for the metal to be forked? Yes; our sandstone is forked.
16216. Whereas in the case of the Sewerage Construction Branch it is screened? Yes.
16217. By the forking you would take out a greater proportion of small stuff? Yes; a lot of small stuff is taken out of the sandstone in that way.
16218. Will you tell His Honor what in your opinion, taking all things into consideration, would be about a fair thing to allow for a cask of cement in bluestone concrete and also in sandstone concrete? Under the Board we allow 22 cubic feet in bluestone and 27 feet in sandstone concrete. We do not pay for that, but that is what we estimate.
16219. *His Honor.*] What do you mean when you say you do not pay for that? I mean that those are the figures for the purpose of making an estimate. We pay at per cube yard actual measurement; but in estimating the value we have to take into consideration the amount lost in the interstices of the metal.
16220. *Mr. Davis.*] And the figures you have given you consider would be a fair estimate for concrete work between boards? Yes.
16221. *His Honor.*] In sandstone concrete do you calculate for the absolute disappearance of the cement? No; there are 20 feet of metal, 8 feet of sand, and 4 feet of cement—or, in all, 32 feet.
16222. *Mr. Gummow.*] You say you estimate in your Department that the cement will make in the case of bluestone concrete 22 cubic feet, and in the case of sandstone concrete 27 cubic feet? Yes.
16223. And do the contractors, according to the prices they give, consider that your estimate is too high or too low? It all depends upon the circumstances. We never actually have any dispute as to the quantities; but I may state that the other day, since this inquiry has been in progress, we had a little difficulty with one man who said that the estimate was too low. It was a difficult piece of work, and the resident engineer could not well measure it. He said, "Will you take our gauging"—mentioning the quantities I have given. The man said that that was too low. Personally I have not had any difficulty with the contractors in that respect.
16224. But is it not the rule for contractors to be much below your estimate? Yes; always.
16225. So that the quantities in your estimate cannot be much too high considering that the contractors cut your estimate? No; I know of cases where sandstone has gone up as high as 30 feet, 16225.

16226. *Mr. Parkes.*] You say that sandstone concrete diminishes from 32 to 27 feet after mixing? Yes; T. Griffiths. measured in the work.
16227. After it has shrunk and become dry? That is the measured quantity in the work.
16228. It shrinks to that? Yes.
16229. And 28 feet in the case of the bluestone concrete shrinks to 22 feet? Yes.
16230. A cask of cement in the case of bluestone concrete goes to 22 feet, and in the case of sandstone concrete to 27 feet? Yes.
16231. As far as the ramming of concrete goes, no matter what its position may be, what percentage would that make in bulking? It is impossible to say.
16232. Would it make 50 per cent. difference? It all depends upon the position of the concrete. I gave you just now an instance of packing over a tunnel. The drive may be very nearly the exact shape of the sewer, and in that case, as I said, it would be impossible to put 2-inch metal through a  $\frac{1}{2}$ -inch space.
16233. But the drive would be only cut out in that way by means of guttering and gadding? Not necessarily. You do not blast out the exact shape. You have to scabble afterwards, and scabbling is practically the same as guttering and gadding. It is done without the use of powder.
16234. Still there are irregular cavities left in the case of blasting? Of course; in either case you cannot get it out to the exact shape.
16235. But in the case of blasting there would be considerable cavities—say from a foot to 15 inches? It all depends upon the ground. It may be jointed.
16236. You would have to pack those cavities with sandstone concrete? It all depends. You may come across a place where you could not push the metal through; that would mean the leaving of a cavity of whatever size it might be.
16237. But surely when you have a cavity you would brick only half way along it before you started to ram? The bricklayer would do that if he minded his own business properly.
16238. So that the cavities to which you refer would be well rammed? Exactly; and I do not mean to say that that has not been done. I was merely giving you an instance as to how cavities may occur in work.
16239. If the brickwork is built up tightly against the rock there is no chance of there being any grouting on the top? We invariably put in a joint of mortar at the back of the brickwork in such cases.
16240. Without any concrete? Yes; as there is no room for concrete.
16241. Suppose the cavity is so small that you had a difficulty in grouting the joint? We do not grout the joints.
16242. You merely put in a collar-joint between the brickwork and the rock? Yes.
16243. That is not concrete? No.
16244. Coming to the Monier arches, when that work was first started was it under Mr. Hickson? It was started under Mr. Darley and myself. I think Mr. Darley was away on leave, or had just returned. I had the supervision from the start. Mr. Smail was the acting Engineer-in-Chief during Mr. Darley's absence. I believe, as a matter of fact, that the work was set out under Mr. Smail, but it is one of those things which it would be somewhat hard to locate exactly.
16245. You cannot locate the exact time of the change? No.
16246. Was the first bay done under you? Yes.
16247. It was all compo.—aqueduct and everything, was it not? I think the first one we did was the approach on the Forest Lodge side. I remember that we asked the contractors to construct arches of various materials. That would be in the approach.
16248. But was not the first bay including the carrier built of compo.? Not that I know of. The first arch was of compo., but I think the carrier was of small bluestone concrete. I am referring now to one of the little arches.
16249. But what about the first section of the carrier? I think it was of compo. The other was of various proportions of fine bluestone concrete.
16250. There was a change made—it was determined not to carry out the whole of the carrier in compo.? Yes.
16251. Why was it done? Mr. Darley suggested it, I think. He thought it would be just as well to substitute the concrete as being a more water-tight material than compo.
16252. Were any tests made of that piece of compo., do you know? Yes; I believe a bulkhead of brickwork was built in for that purpose.
16253. And it was found that it would not hold water? That I could not say.
16254. At all events a test was made? I understood that it was.
16255. After that test was made Mr. Darley determined to adopt the concrete? No; it was after Mr. Darley and I gave up control that the thing was tested as far as I know.
16256. When did you and Mr. Darley give up control? I think Mr. Darley gave up control on about the first of April in this year. I think he held the position for about twelve months.
16257. And you made the change with him? I was kept on some time after, as I had to keep in touch with the work during the time Mr. Davis was getting back into his position.
16258. Who has control of it now? Mr. Davis and Mr. Millner.
16259. The change from the compo. to the concrete was made with Mr. Darley's consent? He made the change.
16260. Was it because he was dubious about the compo.? I do not think so. He had an idea that the other material would be more watertight because more cement was put into it.
16261. Would more cement be put into the concrete than was put into the compo.? Yes; the compo. was 3 to 1.
16262. And the concrete was 5, 3, and 2? Yes.
- 16262 $\frac{1}{2}$ . Would more cement be put into that than into the compo.? Yes.
16263. Take a yard of compo., 3 to 1, there would be much more cement put into that, would there not? No; certainly not. You have to consider the amount of mortar it makes in the concrete. That is where the strength lies; 3 to 1 mortar is not as good as 2 to 1 mortar, which are the proportions of compo. in the concrete.
16264. But as regards the swallowing up of cement the compo. takes the most? It does not swallow it; it is part of the compo.

- T. Griffiths. 16265. But you want more cement in the compo. than in the concrete? No; there is more in the concrete than in the compo.
- 9 Sept., 1896. 16266. Take 1 yard of compo., two casks of cement go to the yard? Yes, in the compo.
16267. How many go to the yard in concrete? I have never tried the gauging at all. The bluestone you referred to is not the bluestone which is generally used. The bluestone concrete you are now referring to contains all the dust and particles right up from a  $\frac{3}{4}$  gauge. The bluestone concrete in the carrier is not the bluestone concrete which is generally used in works.
16268. What sort of bluestone concrete is it? Well, it is bluestone which has passed over a  $\frac{3}{4}$  or  $\frac{3}{8}$ -inch screen.
16269. What is the size of the stone in 7, 3, and 2 concrete; is not that also fine concrete? I have never used any of the special concrete referred to in the specification.
16270. In making up your calculation as regards the compo. you put it down at £3 10s.? Yes.
16271. You also made a calculation as to special bluestone concrete, 7, 3, and 2? I do not think I did.
16272. Not in your schedule? I do not think so. It is a long time ago, and I could not say unless I had the papers in front of me.
16273. When you made your estimate of £3 10s. for the compo., did you not work on Mr. Bagge's estimate? I never saw Mr. Bagge's estimate.
16274. How did you make up your estimate then? From my own experience.
16275. What quantity of cement had you? I could not give you the details offhand.
16276. As to Contract 69, when did you come on to that work? Early in April, 1895.
16277. Practically, the work was completed then, was it not? No. The tunnel work was finished, but there was the syphon in the Illawarra Road and the Premier-street shaft to be done.
16278. Were you in charge when Benson did the work which you have referred to? Yes; I had general charge as supervising engineer.
16279. Did you see him doing the work? No.
16280. How have you ever seen the work he did? I must have seen it in making my inspection.
16281. But have you seen the actual work? I cannot say that I saw the pipes being laid, of course.
16282. You were not standing there when the work was being done? I should not necessarily be standing by when any part of the work on the contract was being done.
16283. At all events you did not see Benson doing his work? I do not remember seeing him do this particular part of the work.
16284. Did you make the plan of the work which you have produced? It is a plan of the work as actually carried out.
16285. Can you say definitely that the work was carried out with the difference in the joints that you show? The work was carried out exactly as it is shown upon this plan.
16286. Is it as you saw it? I did not see it.
16287. *His Honor.*] Who made out the plan? It is made out from particulars supplied by the inspector.
16288. Who drew it? One of the draftsmen.
16289. When? After these men, Benson and Darcus, gave their evidence, I had a report and sketch prepared from particulars supplied by the inspector.
16290. Your evidence upon this point then is only from an account given by the inspector? Yes.
16291. Who was he? Husband.
16292. He actually saw the work done? He supervised it.
16293. *Mr. Parkes.*] Were you present when Darcus did the work he referred to? As a matter of fact, I do not know who Darcus is. I saw men there several times fixing up the framing.
16294. Did you set out the work? No; I had no time for that.
16295. Did you see the irregularity in the levels? I do not think there was any irregularity.
16296. You have given evidence that they were out of parallel;—have you seen that it is so? I told *His Honor* that it would not be perceptible to anyone unless they were told that there had been a mistake.
16297. Have you seen the work since it has been finished? Yes; but not since this evidence has been given. If one were there one could not detect it.
16298. What is the width of the pipe? The diameter of the pipe is 3 ft. 9 in., discharging into a sewer 5 ft. 2 in. by 4 ft. 2 in.
16299. Did you know anything about its being out of level before you saw Darcus' evidence? It was not out of level; it was out of alignment.
16300. But did you know that there was any defect there until you saw Darcus' evidence? No; I should not be able to detect it now if I were on the spot, nor do I think anyone else would be able to do so.
- 16301-2. *His Honor.*] The two axes are correct;—they are as intended? Yes.
16303. There was no mistake in that;—the mistake was in constructing the chamber rectangular instead of with the two sides deviating by the small angle of 44 minutes? Yes.
16304. *Mr. Parkes.*] Mr. Darley was not very long in charge of the sewerage works, was he? About twelve months.
16305. That is the only time he was in charge of sewerage works? I could not say what his experience may have been, but he was in charge between April, 1895, and April, 1896.
16306. But part of that time he was away upon a holiday? To the best of my recollection he was due back on the 1st July; but he actually came back a week or a fortnight before his time was up.
16307. How many months out of the twelve was he absent on a holiday? I dare say about ten weeks.
16308. So that, practically, he was in charge of the sewerage works for only ten months? From nine and a half to ten months.
16309. His principal work has been in the Harbours and Rivers Department? General work, I suppose.
16310. How long have you been in the Service? Since the inception of the Board.
16311. How long would that be? We started in 1890. I commenced my duties on 2nd January, 1890.
16312. How long have you been in the Colony? Ten years.
16313. Prior to that what were you? A contractor's engineer.
16314. With whom? Jones and Jepson.
16315. Who are they? Large railway and public works contractors.
16316. With whom have you been in this country? I was Assistant City Engineer in charge of sewerage works at the time the works were handed over to the Water and Sewerage Board. I was transferred to the Water and Sewerage Board at that time.

16317. *His Honor.*] Who was in actual charge of the work upon Contract 69? From April, 1895, to its completion. Mr. Gibbs was the resident engineer in charge. The whole of the tunnelling had been done prior to my taking charge. Part of the syphon had also been done, but we completed it.
16318. Mr. Gibbs, then, can speak as to the actual facts in connection with the alleged defective work? Not more so than I have done. He could not say more than I have done. He could only speak of the work in a general way.
16319. Have you seen the work since you left the contract? I was through it from before the works were taken over from the contractors.
16320. You have spoken to-day, then, your own knowledge? Yes; but in regard to the work spoken of, as I have already said, I could not notice it in walking along it if my attention had not been directed to it. I made the final inspection of the whole work. The mistake which has been referred to this morning is so slight that it would be likely to escape anyone's attention, and it would not affect the sewer in any way either as to its stability or its efficiency.
16321. The angle put into the axis is too small to make any difference? It cannot make any difference.
16322. Have you compared different pieces of concrete one with the other? Yes.
16323. What do you say as to the piece I now hand you;—is it more dense or open than average concrete? The density would depend to a great extent upon the position in which the concrete is fixed.
16324. The piece I hand you was taken from the invert of a sewer on a bad foundation, where the ramming would be light? I should say then that it was very good concrete.
16325. You will see if you look at it with a glass that it is honeycombed? Yes; that would be the case unless you could ram it pretty tightly.
16326. Can you practically ram the air out of it altogether? No; I do not think so.
16327. The difference between lime mortar and concrete is that, in the one case, you have to do all the work at once. In the case of lime mortar the longer you leave it the better it gets so long as you do not let it dry? Yes.
16328. That is due to the fact that the air originally contained in it becomes practically dissolved in the water? Yes.
16329. So that the particles are practically brought into actual contact? Yes.
16330. In concrete you have to take the air as you find it? Yes; I should say that the piece of concrete that you hand me is a good piece. I see that the stone has been actually fractured in the taking of it out. With regard to my estimate of the value of the Monier work in Contract 77 I should like to explain that I have looked for the details, but I have not been able to put my hand upon them.
16331. Could you not put your estimate upon paper again in the course of the morning and hand it in later on? Yes; I will do so.

T. Griffiths.  
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George Alfred Fowle sworn and examined:—

16332. *Mr. Davis.*] What is your position? I am by occupation a bricklayer.
16333. What are you in the Department? An inspector.
16334. Where are you at present employed? I am at present employed upon the Newcastle suburban drainage.
16335. Were you employed upon Contract 79? Yes.
16336. Did you go right through with the brickwork, concrete, and cement rendering, done on that contract? Yes.
16337. And you started upon Contract 79A? Yes.
16338. As to the returns of cement which you make upon contracts, and which you made upon these two contracts particularly, can you vouch for their accuracy? Yes. In cases where other inspectors were employed under me, I took their word, but at the same time I always kept a check—that is, of the number of casks taken out of the cement shed and the number delivered on the site of the works. I occasionally took a check in that way in order to check the other inspectors.
16339. And having adopted these precautions, you think you can say that your returns are fairly correct? I can say that they are correct.
16340. They represent the quantity of cement used in the concrete, brickwork, and cement rendering, as far as Contracts 79 and 79A are concerned—I mean your own returns? Yes.
16341. You had chief charge on Contract 79? Yes.
16342. For a portion of the time you had Inspector Reid with you, had you not? Yes.
16343. Do you remember anything which occurred in November, 1893, in connection with Inspector Reid? I cannot, speaking from memory; but I have notes of pretty well everything that took place upon the contract. (*Vide Appendix No. 56*).
16344. Do you remember Reid's coming to you in November, 1893, in respect to anything he regarded as defective work? I cannot recollect the date.
16345. Can you remember anything which occurred in connection with the brickwork? Several things occurred in connection with Reid.
16346. Do you remember his coming to you and complaining of something which had happened to one of the bricks? Yes; I remember that on one occasion during a night shift, upon the up-stream side of No. 7 shaft, he had a complaint to make to me.
163447. What was the complaint? About bad workmanship.
163448. Did you investigate it? Yes; I went down next morning, as I usually do in such cases. I always take upon myself to pass the workmanship in the brickwork—that is, the finished workmanship. On this occasion, in making an inspection, I discovered at the particular spot to which Reid referred that a little piece had been chipped off one of the bricks—a piece the size of a finger-nail.
163449. While that might denote great care on his part, it did not, in your opinion, constitute bad workmanship? Certainly not.
163450. Do you remember anything that occurred at the latter end of January in respect of shaft No. 6? I cannot recall the dates.
163451. Do you remember any complaint which Reid made as to dry stone being put down a shaft? Yes.
163452. Will you tell His Honor briefly what occurred? It occurred at shaft No. 6 during the night shift. Inspector Reid had charge of the mixing of the concrete on the top of the shaft, and on the next day

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- G. A. Fowle. day he saw me and made a complaint as to dry stone being put down in lieu of concrete. On this occasion I made an inspection of the work; speaking from memory, in February. The foreman brick-layer, Connors, accompanied me. I had the brickwork cut open on both sides of the shaft, and I found the work to be good. The concrete which had been put in between the rock excavation and the brickwork was in first-class condition, and I made a report to that effect to the resident engineer.
- 9 Sept., 1896. 16353. *His Honor.*] What had Reid reported to you? That dry stones had been put down in lieu of concrete.
16354. Did you make an examination of the exact spot as far as Reid could point it out to you? Reid declined to go down the shaft at this particular time. I know, from what I have seen from working at the trade myself, and from what I have seen since I have been in the Department, that in raising the staging you may have some surplus cement mortar; and a few barrowfuls of stone might be mixed with that surplus, instead of being wasted. That has been allowed in some cases.
16355. But did Reid refuse to go down with you when you were making your inspection? Yes, point blank.
16356. Upon what ground? I could not say on what ground. Whether he was frightened or not I do not know, but he declined.
16357. How did you go down? In the skip.
16358. Was the regular engine-driver there at the time? Yes; but as to whether the regular engine-driver would be there at night-time, I could not say positively.
16359. When you went down the regular engine-driver was there? Yes.
16360. And it was at that time that Reid refused to go down with you? Yes.
16361. Did he seem to be frightened, or what was the matter? He seemed, in my opinion, to be frightened, but I could not say whether he was or not.
16362. *Mr. Davis.*] Do you remember whether I afterwards came across to investigate the matter? Yes.
16363. Did you attend at the field office, with the resident engineer, with Reid, and with the contractors, with a view of arriving at some understanding as to what really did occur? Yes.
16364. And you were able to say on that occasion that you had examined the work and had found it perfectly right? It was in good condition. The face of the concrete was as smooth as a board. Reid himself will remember that.
16365. Do you remember Reid, being removed from Contract 79? Yes.
16366. How much work was there to do when he was removed? I find on going through my notes that there were about 30 feet of brickwork in shaft No. 5 to be completed. That was the whole of the brickwork upon No. 79 to be done after Reid was removed.
16367. So that, as a matter of fact, the necessity for Reid's presence, although he was removed, was virtually at an end? Yes, with the exception of the 30 feet to which I have referred.
16368. That was the whole of the brickwork which had to be done upon the contract? Yes.
16369. *Mr. Parkes.*] Were you upon Contract 79 during the whole of the time it was in construction? Yes.
16370. Did you go there the first day the work started? Yes.
16371. Did you finish up there? No, I did not finish the extension in, I think, Ernest-street.
16372. There were a number of reports sent in by you from Contract 79, forwarding samples of cement;—did you send in reports as to every parcel of cement which went over to the contract? A large quantity of cement had been delivered there previous to my going over.
16373. Where was it stored? In the contractors' yard.
16374. Where would that be? In Alfred-street, between shafts 4 and 5.
16375. In a shed? Yes.
16376. How many casks? I could not say from memory. I know that there was a large number. There was also a large quantity of bricks. I see from my notes that on June 15th, 1893, there were 853 casks there.
16377. There were 853 casks in the shed? Yes.
16378. Will you look up your notes and see when you went on to the job? That would be the date—June 15th, 1893.
16379. Not 1892? No.
16380. Was that the first cement put on to the job? It was what was on the works when I went over to take charge.
16381. What was the brand of the cement? I cannot say. I did not make a note of the brand.
16382. Was it branded cement? Yes.
16383. Did you have it tested? It was tested before I went there. The resident engineer instructed me that it was all tested cement.
16384. You cannot recollect the brand? No. I have no note of it.
16385. Did you have a sample taken of all the cement sent on to the job after that? Yes.
16386. Therefore there is no doubt but that you sent in reports as to the whole of the cement delivered on the job? There is no doubt about my knowing of all the cement that was delivered.
16387. And you returned to the office in your reports the right number of casks? Yes.
16388. Were the returns of the inspectors given to you daily? Usually in the evening.
16389. Would you check all your sub-inspector's statements? Occasionally I would go into the shed and check the number of casks there.
16390. Would there be any likelihood of mistakes in those returns? There were the daily reports, as I have said, of the inspectors under me, and I used to check those at least once a month for my return to the resident engineer.
16391. How did you carry out your check? By counting the number of casks which remained in the different cement sheds, and comparing that number with the returns which were made to me of the quantity which had been used daily.
16392. *His Honor.*] You compared your notes of what had been used daily with the difference between the number of casks there had been in the store and the number you found when you made your second count? Yes, there was a double check.
16393. *Mr. Parkes.*] The sheet I now hand you shows the way in which you made your return of cement to the office? Yes.



16394. There was no chance of untested cement coming on to the contract which you would not return G. A. Fowle. in this way? Not upon Contract 79. There were three cement sheds there, and I always had the quantity of cement in them checked. 9 Sept., 1896.

16395. Supposing Contract 79 was started in March, 1892, did you go on to the job before the work was set out, or when did you first go on to the work? When the construction was first taken up—the brick-work, the concreting, and the rendering.

16396. You went on to the job when the first cement was used there? Yes.

16397. And the certificate I hand you shows the way in which the returns were made up by you at all times? Yes.

16398. How many cement sheds were there, do you say, on Contract 79? There were three cement sheds altogether. One was in Berry-street at No. 11 shaft, another was in Alfred-street between shafts 4 and 5, and the other one was at No. 2 shaft.

16399. Will you tell me the names of the inspectors under you? There were, at different times, Harris, Gledhill, Wagg, Reid, Vincent, and Eyre.

16400. Do you recollect writing this letter on 19th February, 1894?

Contract 79, North Sydney,  
19 February, 1894.

Sir,

I beg to report that on several occasions I have had to complain about the time the sandstone concrete is mixed for packing brickwork in shafts. To-day two 20-foot mixings were made up at 2 p.m. at No. 5 shaft. This concrete will not be put down shaft for use till 5:30 p.m. I have instructed Connors (foreman), who has charge of this work, not to have the concrete mixed so long before being used. He states to me that he has to take his instructions from the firm. I saw Mr. Snodgrass last Friday and complained to him about this matter, when he promised it should not be mixed until one hour before it is required to be used. I spoke to Reid (contractors' representative) to-day, and he states that they shall mix the concrete when convenient for themselves.

Inspector Reid informs me that on Saturday last, 17th February, about 1 p.m., at No. 6 shaft, it required half mixing 10 feet of sandstone concrete to finish brickwork packing in shaft. Henderson, bricklayer working in shaft, was on mixing board, and started to assist labourer gauge the stone. Inspector Reid instructed Henderson to use the fork in place of shovel in filling gauge-box, as the stone, which is broken close to the mixing-board, is not free from refuse. Inspector Reid asked Henderson the second time to use fork. Henderson replied that it did not want forking. Connors, the foreman, came on the scene and said to Henderson, "Go on; do not take any notice of him, he's only a damned big buck navvy."

I have, &c.,  
G. A. FOWLE,  
Inspector.

Correct.—R. G. REID.

Yes.

16401. So things were not going on too nicely on the job after all? Undoubtedly they were not.

16402. You had some trouble with the contractors' men seemingly? We had the usual trouble.

16403. Did not Inspector Wagg also send in a strong complaint—stronger even than Reid's—concerning the contractor's foreman? Yes.

16404. Was not Reid, the contractor's foreman, a man who would take advantage of you every time your back was turned? I could not say that.

16405. But he would take a point? He would take a point if he could get it.

16406. Therefore, anyone would require to be rather particular on this contract? There is no doubt about that.

16407. If an inspector complained now and again it would be to his own detriment; it would not be to the advantage of the Government to have these men complaining about bad workmanship; that is to say, an inspector would gain nothing by being very strict? He would be doing his duty, I suppose.

16408. Would it not irritate you, as an inspector, if you saw men constantly trying to get the better of you? Yes.

16409. You would be pretty hot upon them? Of course I would rather see the work going on smoothly than having constant trouble.

16410. If you caught a man trying to do bad work would it not create a suspicion in your mind with regard to him? Yes.

16411. And you would often be suspicious of bad work perhaps where, as a matter of fact, bad work was not put in? Of course that sort of thing would tend to make an inspector suspicious.

16412. It would be possible to find good or bad work in different parts by taking out a brick here and there? I would not say that.

16413. What I mean is that a workman could not get in bad work in a whole shaft if an inspector was watching him? No.

16414. But if an inspector's back was turned now and again it might be so? If an inspector was away from his duty.

16415. An inspector might come back quickly and catch a man starting bad work, and might complain of him? Yes.

16416. And there might be a difficulty afterwards in locating the bad work in the shaft? There would be no difficulty in that.

16417. What would be the height of a shaft in this case? Somewhere about 150 feet.

16418. Do you say that they were pouring the material down from the top? Yes; they were working 60 or 70 feet from the surface, and the material was put down the shoot on to the stage.

16419. Inspector Harris had a mortal fear of these shafts, had he not? He was a bit scared on one or two occasions.

16420. They ran him up at a lively speed on one or two occasions? I think we all got scared at times.

16421. What did they do? In lowering us in the bucket sometimes the engine-driver—I do not know whether it was carelessness or what it was—would give us a sudden jerk in the shaft.

16422. At times let you down with a rush? I do not know about that, but they would jerk us about a bit.

16423. Did not Harris on one occasion make five or six rapid trips backwards and forwards in a shaft? I remember on one occasion his saying something about the way in which he was lowered down and brought up.

16424. He went up and down a number of times in quick succession, until he was stopped at the top of the shaft, and was glad to get out? Some kind of work was probably going on below, and the men down there were giving false signals to the engine-driver to stop, or to lower, or to pull up, as the case might be.

16425.

- G. A. Fowle. 16424. In other words, while they were doing a bit of bad work they kept the inspector in the shaft? They could not do bad work while he was in the shaft, because on this occasion they were working in the drive, and an inspector was down below. At this particular time Harris was looking after the rendering work. He came through, past the bricklayers. While he has nothing to do with that work, no doubt if he had seen anything going on which he thought wrong he would have reported it to me.
- 9 Sept., 1896. 16425. At all events, you say they kept him in the shaft some time? I do not know if they kept him there, but it is very probable that they played some trick upon him.
16426. Do you remember his going up and down the shaft a number of times in succession? Yes.
16427. Did he ask to be sent from that job? Not that I know of.
16428. Was he shifted? Yes; he was shifted. Both he and Wagg were removed; but I do not remember the dates.
16429. Can you recollect the reason why Harris was removed? I believe there was work opened up on other contracts. That was the reason.
16430. Who took his place when he was shifted? Inspectors Reid and Vincent took the place of Inspectors Harris and Wagg.
16431. How long was Vincent there? I think he started at the same time as Reid.
16432. But how long did he remain there. Did he go to 79A? I could not say. I was not there at the time.
16433. Was he upon 79A when you were there? No.
16434. How long were you upon 79A? I am afraid I cannot give you the dates from memory.

Thomas Griffiths recalled and further examined:—

- T. Griffiths. 16435. *Mr. Parkes.*] You have made an estimate of the cost of the Monier work upon Contract 77? I may explain that when I prepared my first estimate it was from my own experience of the various classes of work. I have in this estimate taken each item separately. They are as follows:—
- 9 Sept., 1896.

APPROXIMATE ESTIMATE of Cost of "Monier" Work, Contract 77, "Compo." portion in main arches.

|   | £     | s. | d. |
|---|-------|----|----|
| Cost of material, 3 sand, 1 cement, per cubic yard .....                                | 1     | 10 | 0  |
| Labour, mixing, and putting into position, per cubic yard .....                         | 0     | 8  | 0  |
| Cost of centering and framing, and use of plant, per cubic yard .....                   | 0     | 8  | 0  |
| Labour taking down, fixing, and refixing, centering and framing, &c., per cubic yard... | 0     | 8  | 0  |
| Preparing iron for grill, per cubic yard .....  | 0     | 2  | 0  |
|   | <hr/> |    |    |
|   | £2    | 16 | 0  |
| Supervision, profit, royalty, &c., 25 per cent. ....                                    | 0     | 14 | 0  |
|   | <hr/> |    |    |
|   | £3    | 10 | 0  |

T. GRIFFITHS, 9/9/96.

NOTE.—No allowance has been made for risk or guarantee.

George Alfred Fowle recalled and further examined:—

- G. A. Fowle. 16436. *Mr. Parkes.*] Can you now recollect when you went on to Contract 79A? I went on to the contract some time in February of last year, and I left on June 6.
- 9 Sept., 1896. 16437. What work was being done at that time on the job? Principally excavation. There was a small quantity of brickwork done.
16438. In what portions of the sewer was the brickwork done? Between shafts No. 17 and 18.
16439. Was it finished? It was only partly done.
16440. Was any done between the other shafts? Between 15 and 16 a portion was done.
16441. Was any other brickwork done between the other shafts? No.
16442. Was no work done between Nos. 11 and 12? No; the drive was not through.
16443. Who took your place? Inspector Andrews.
16444. Would he make his returns of cement in the same manner in which you made yours? I could not say.
16445. These returns are made in a certain way by order of the Department? Yes.
16446. Mr. Weedon, on 20th February, 1894, wrote a minute upon your letter of 19th February, to which you have already referred;—was he Supervising Engineer over the job? He was relieving Mr. Boys at the time. Mr. Boys was away on a holiday.
16447. Was Mr. Weedon over 79A while you were on the job? Partly.
16448. *His Honor.*] You saw a good deal of the contractors' manager, Reid, and also of the foreman bricklayer, Connors? Yes.
16449. First of all as to Reid;—what sort of man would you describe him as being? He is a man who is naturally irritable. He suffers a good deal from asthma. I have known him for ten or twelve years, and I know his disposition pretty well. He loses his temper instantly, and five minutes afterwards he will come to again. On the spur of the moment, sometimes, what with his asthma, and a few drinks which he may happen to have in him, he will let go.
16450. Is he given to putting too many drinks into himself occasionally? Yes.
16451. While he is on the work? Yes.
16452. But both asthma and thirst may be quite consistent with honesty;—what sort of a man was he with regard to pointing? I do not think there is any difference between Reid and the rest of them I have had to deal with. I have had worse men than Reid to contend with—far worse.
16453. And you have had better? Yes, far better.
16454. Then Reid is a man who will take a point if he can get it? Undoubtedly. I know Reid well. When I was working at my trade on public works some years ago I had him labouring for me.
16455. How did you find him then? Just the same as afterwards.
16456. Would he do bad work when no one was looking? He had no occasion to do bad work then he was merely labouring.

16457.

16457. But a labourer will sometimes do bad work? Upon this particular work he could not. He was simply passing the bricks and compo. along. He was doing no work that could be scamped.
16458. When as manager he could scamp work you think he may have done so? I have never caught him. He had nothing to do with construction. He merely gave orders.
16459. He had the general management, and gave orders to the men as to how they were to do the work? Yes.
16460. And you sometimes caught the men doing bad work? Yes.
16461. How did they excuse themselves;—did they say that the work was being done by order, or did you find that it was being done by order? No, it was due to carelessness, as a rule, on the part of the men. On some occasions, in the bricklaying, the men would race one another to see who could get through the quickest, in order to curry favour with the contractors. Of course the man who got through first with his length would be thought more of by the contractors. He might be thought to be a better man from their point of view than the others.
16462. *Mr. Parkes.*] Were there any prizes attached to this racing? I have never known of any in that work.
16463. *His Honor.*] That sort of thing would be approved by Reid, as far as you could see? Yes.
16464. How about the contractors themselves? I scarcely ever saw them interfere with the work—in fact they never did on any occasion. I have seen them come on to the works and go to the office, but that is all. I remember that after cautioning Reid about the mixing of the concrete I on one occasion approached Mr. Snodgrass, and he promised faithfully that the matter should be remedied.
16465. Was it remedied after that? No, it was not.
16466. Things went on in the same way? Yes. I saw Reid, the contractor's representative, and I could get no satisfaction from him. What Reid said I embodied in my report. After speaking to him I approached Mr. Snodgrass himself.
16467. Did you hear Mr. Snodgrass speak to Reid on any occasion? No.
16468. Whether Reid was acting on his own account in allowing work to be badly done, or whether he was acting under instructions, you could not tell, I suppose? No, I could not say.
16469. You had no means of discovering from Reid whether he was acting under instructions in getting work scamped? As far as Contract 79 is concerned, I do not think there was any scamping in any of the work on which I had charge.
16470. I understand you to say that there were attempts at it? Yes.
16471. And you think you nipped them in the bud? Every day there would be something to complain of, but you could not exactly call it scamping—wilful scamping is a very different thing from mere carelessness, for which you might have frequently to caution men.
16472. But carelessness goes with quick work, and often quick work is in the interests of the contractors? Yes.
16473. Was it carelessness, the result of quick work, that you were complaining of? Not as regards the mixing of the concrete.
16474. That would be a saving of cement? Yes.
16475. In point of fact, Reid was complained of on several occasions? Yes.
16476. Yet he was kept on? He was kept on all the time that I was there, but I might mention that on other works, with other contractors, the same sort of thing has taken place. I could not make an exception as regards Reid.
16477. As far as his being a manager is concerned, what sort of man was he? He was a good manager; there is no doubt about that.
16478. A man worth keeping? Yes; he was a good contractor's manager.
16479. As to Connors;—did you see much of him? Yes.
16480. What sort of man was he at work? He was an honest man; I have never proved him to be otherwise. As far as my personal dealings with him are concerned, I have never caught him scamping or trying to neglect work.
16481. You would put him down as a better class of man than manager Reid? Yes; I give Connors credit for being a more honest, steady, sober, man.
16482. As to Inspector Reid, was he a difficult man to get along with or not? There was this difficulty about him: he had a weakness, and that was for nagging. He was of a nagging disposition. He was a very strict man.
16483. A very honest man? Yes; I would take him to be an honest man. The only fault that I had to find with him—and I had to speak to him about it several times—was the injudicious way in which he would approach the men. He would have the last "spoke," and he would keep on speaking about a point. He would not caution a man and then let him rest, but he would be continually nagging and irritating him about it.
16484. He seemed to have no tact? Yes. Take the case of a man who is working in a sewer 3 feet 3 inches by 2 feet 2 inches. He has to twist himself about into all sorts of positions, and he has quite enough to put up with without being irritated in the way I have described. One thing would bring up another, and that would lead to words.
16485. I suppose the shafts upon Contract 79 are the deepest on any sewerage work which has been done since the Bondi work? Yes; taking the aggregate, they are the deepest on any contract, with the exception of the Bellvue Hill work.
16486. So that the work for the inspectors was rather more risky upon Contract 79 than on an average contract;—I mean going up and down the shafts, and that kind of thing? The work on Contract 79 was easier in some cases than upon 79 A. You would be hoisted and lowered up and down in a bucket on 79, and on 79 A you had to climb ladders in the shaft.
16487. The engine-driver would have a better opportunity to play tricks then on Contract 79? Yes.
16488. You were fairly strict, I suppose? Yes; I attempted to do my duty honestly and faithfully.
16489. Had you yourself any trouble with the men;—were any tricks played upon you in lowering you down the shafts, and that sort of thing? I do not know whether you can call it trickery. In going down any shaft in a bucket you would sometimes swing round, and when you were getting twisted too much you would naturally shout out to a man below to stop the bucket. The bucket would be flying round and the shaft might, perhaps, be full of steam and it would be impossible for you to see anything in front of you. Then if the man below signalled the driver to stop the bucket he might give you a sudden jerk.

- G. A. Fowle. 16490. The man would be simply doing his duty? Yes; I cannot say that I had any tricks played on me.
- 9 Sept., 1896. 16491. Would you say that Inspector Reid was a timid man? No. I never knew him to shirk his duty in going down below.
16492. But you said upon one occasion—I think at No. 6 shaft—that he would not go down? No, not on that particular occasion.
16493. On that occasion he seemed to be afraid of something? I do not know what it was, but he declined point blank, and said he would not go down.
16494. *Mr. Davis.*] As to the trouble which you say you experienced with the contractors' men on Contract 79, was it greater than you would experience upon other contracts with the men of other contractors? No; I have had worse contractors than Carter, Gummow, & Co. to deal with, as far as that goes.
16495. *His Honor.*] There can be worse men than Carter, Gummow & Co., you think? I promise you there can. You will see that from my reports in connection with other contracts.
16496. *Mr. Davis.*] When you complained to Mr. Snodgrass about concrete being mixed before it was required, according to what you said just now, no attention was paid to your representations. What action did you take then? I left the matter in the hands of the Resident Engineer.
16497. You reported the matter in accordance with your usual custom? Yes.
16498. And then action was taken? Yes, I think action was taken afterwards. I think the concrete was mixed within the hour as Mr. Snodgrass had promised.
16499. That was after the matter was represented to the Resident Engineer? Yes, I think I remember Mr. Weedon seeing the contractors about it.
16500. Had you any difficulty in locating the precise spot where the dry stone was supposed to have been put into the shaft? No difficulty whatever. It was only a matter of seven or eight hours work. It was a question of taking out a few bricks—holding what we call a *post mortem* examination of the work.
16501. From the notes in your book you would have no difficulty in locating any particular day's work? No; I sent in every day a report of the work in progress and the work which had been carried out on that particular day.
16502. Do you remember the conversation with Inspector Reid at the end of 1893, just before he came on to Contract 79? Yes.
16503. Do you remember where it took place? In Walker-street, close to Mount-street.
16504. Where were you going at the time? I was going down to the ferry boat.
16505. What did Reid say to you? I was on one side of the road with Inspector Harris, and Reid, with, I think, his father-in-law, was coming up from the ferry. He came across the road and I met him half-way. He said he had been into the office and that he was to be reinstated. He was all smiles, and he said that when he did get a start he would make it hot for some of them. I could not positively swear that those were his exact words, but he seemed very sore upon this particular occasion, and I remember telling Inspector Harris after leaving him, what he had said to me. I do not think I have seen him from that day to this.
16506. You said that 853 casks were stored in the contractors' yard upon Contract 79? Yes; that is the note I have in my book.
16507. Were they, as a matter of fact, stored in the contractors' yard? I could not say whether they were all in one shed or not.
16508. What you say is that 853 casks were on the ground when you went over to the contract; you do not pretend to say exactly where they were? No. I may have said to Mr. Parkes just now, that they were at Alfred-street, but I could not say positively that they were all in one shed.
16509. *Mr. Parkes.*] I suppose you counted the casks? As nearly as I possibly could. The note in my book is to the effect that there were 853 casks on the work on Thursday, June 15th.
16510. *Mr. Davis.*] Do you swear that the 853 in your note book represents the number of casks on the ground on the date you have put down there? Yes, that is the note I made.
16511. I see your note book has not the word "casks," there are merely the figures "853"? Yes.
16512. *Mr. Parkes.*] That would be casks of course? Yes.
16513. *Mr. Davis.*] Will you read out the note you have opposite the date on July 21st, 1893? Yes, "850 Wouldham and Try's, 500 Wouldham." Both of these were passed, and I have put opposite to them the letter "P"; that note is made as a sort of check upon the cement on that particular date. It would have been one of my usual checks upon the cement used in the work as compared with the cement delivered on to the work. The note I am reading you would give the total quantity of cement upon the work on that particular day. The note continues "500 Germania, 180 Germania, and 69 from stormwater channel." The last part of the note would mean that 69 were delivered upon the work from another contract.
16514. *Mr. Parkes.*] Who delivered it? I have no note of that.
16515. *Mr. Davis.*] You said just now to Mr. Parkes that the only cement brought on to the ground was that which you, yourself, submitted for testing;—on the face of the note you have just read, would that be the case? I did not submit the 853 casks to which my note refers.
16516. *Mr. Parkes.*] What other cement was there which you did not submit? I could not say.
16517. Could cement come to the job which you would not submit for testing;—as a matter of fact, did any come which you did not submit? Not to my knowledge.
16518. Might it be that sixty-nine casks, which, according to your note, came from the stormwater channel contract, were not approved cement? No.
16519. *Mr. Davis.*] If it were approved cement you would not submit it for test a second time? No.
16520. How would you know that it was approved cement? Because I had the certificate from the inspector upon that work, which was handed to the carter. As soon as the carter brought the cement on to the works he sent that certificate to me.
16521. *His Honor.*] As regards these other lots, they may have also come on to the works with certificates showing that they had been already tested, and you would not, of course, submit them to test again? No. That was often the case. Cement is frequently changed from one work to another. For instance, suppose a job were being completed at Waverley, if there were a surplus quantity of cement there, it would be sent to North Sydney.
16522. *Mr. Parkes.*] You would have a record of that;—for instance, you have a record of the 853 casks which were on the job when you went there? Yes.

16523. Were there any other parcels of cement which came on to the job while you were there in the same manner as those sixty-nine casks? Several parcels of cement came during the time I was there.
16524. Did you have them all retested? All the new cement.
16525. Was there any cement which came which you did not have tested? Not that I am aware of, unless it came from some other work.
16526. But did you see any which came from any other work? Yes; there were the sixty-nine casks which came from the stormwater channel contract, and which I have noted in my book as passed. I would never accept any cement which came in that way unless it were accompanied by a certificate from an inspector upon another work. When cement was delivered to me under such circumstances my rule was to put my initials upon each cask.
16527. But whenever cement came to you you would make an entry of it in your notebook, would you not? Yes, as a rule. I have 5,000 casks of cement entered up as used on this contract while I was there—1,850 casks on the brickwork, 2,133 in the bluestone concrete, 526 in the plastering, 142 in the sumps. There is some more which I have not totalled up, but that would be the quantity up to a certain date.
16528. *His Honor.*] What I understood you to have meant hitherto is this: you wish to explain that all cement used in the work you have either had tested, or, if it be cement which has been already tested, you have had a certificate showing that to be the case? Yes.
16529. You have not been speaking as to the whole of the quantities of cement which came on to the work? No.
16530. What you wished to explain before was that no untested cement went into the work? Yes.
16531. *Mr. Parkes.*] Would you not send in a return of all the cement which you had upon the job whether you had it tested or whether it came to you tested? No. There might have been occasions when I did not do that. In some cases I may have been at one end of the work, and a load of cement may have been delivered at the contractor's yard at the other end. In that case the nearest officer about as a rule would go and check it.
16532. Would he send you a report? He would tell me that the cement had been delivered.
16533. Therefore there really was no effective inspector's check upon the cement delivered on to the work? Oh, yes, there was a check.
16534. *His Honor.*] A check of what kind—a check to prevent untested cement from being used or a check to find out how much cement was used? I always knew the brands of cement in the shed. I used to look into the shed almost hourly as I went backwards and forwards on the job.
16535. *Mr. Parkes.*] But where is your total tally of the casks which came on to the job? I have given you the total number used on the job up to 1st February.
16536. But I am speaking of the total number which came on to the job? I have not the tally in this particular contract because I was taken away before the contract was complete, and, as I have already explained, when I went there, there was already a quantity of cement on the ground. On other contracts upon which I have been I have kept a tally from beginning to end of the work. When I was removed from Contract 79 there was the extension to which I have already referred to be done, and there was some work to do in No. 4 shaft. On the last contract I was on I kept a tally of the total number of casks delivered on to the work, and the total number used, from beginning to end of the job.
16537. *His Honor.*] So that you could tell exactly the quantity of cement that had been used in the work? Yes.
16538. Was that check kept for the purpose of comparison with the number of cubic yards of concrete paid for—was that the object of it? That was my own object.
16539. You knew that you could get roughly at the quantity of cement that ought to be in the work? I could get that from the resident engineer.
16540. Was the check kept for the sake of seeing whether the work had been done properly in regard to mixing? It was a check for a variety of purposes. I always kept an account for my own sake, taking an interest in the work. I was anxious in all cases to know the quantity of cement which went into the work.
16541. You were able to institute a comparison between the number of casks of cement which you had and the number of yards of concrete? Yes.
16542. *Mr. Gummow.*] In answer to Mr. Parkes, you said that Inspector Vincent came on to the job after Inspectors Harris and Wagg;—what was Vincent—what class of inspector? A second-class inspector.
16543. Was he not really what they call an overseer? The term was changed, if I remember rightly.
16544. Do you remember from the pay-sheets whether Vincent was as highly-paid an officer as Wagg and Harris? No, he was not.
16545. He was a cheaper officer? Yes.
16546. He was probably sent to the work for economical reasons? He was sent there because the work was getting slack and other work was being opened up elsewhere upon which first-class inspectors were required.
16547. A second-class inspector could do the work which remained to be done upon Contract 79? Yes; it was merely on the concrete board.

Joseph Davis recalled and further examined:—

16548. *His Honor.*] You desire to hand in some returns? Yes. These are the inspectors' returns of the cement used upon Contracts 69, 77, 79, 79A, and 118.

J. Davis.  
9 Sept., 1896.

George Chamier sworn and examined:—

16549. *Mr. Smith.*] I think you are a member of the Institute of Civil Engineers? Yes.
16550. You have had some experience in engineering works in these colonies? About twenty-seven years in Australia.
16551. In what colonies principally have you been? I was engaged upon the first railway made in Tasmania, and afterwards in connection with the Victorian Water Supply Department, also upon several railways in the same colony. I was also engaged upon railway work in South Australia and Western Australia, and I have been consulting engineer in Sydney for a firm of railway contractors,

G. Chamier.  
9 Sept., 1896.

- G. Chamier. 16552. You have acted both for the Government in these various colonies and for firms of contractors? Yes; I have acted as manager upon some large railway contracts.  
 9 Sept., 1896. 16553. I think you were in Adelaide for some years? I was in private practice there for seven years.  
 16554. When was that? From 1879 to 1886.  
 16555. From your experience I suppose you can tell us something about the rigging of schedules by contractors? Yes.  
 16556. You have prepared a memorandum on that subject? Yes; it is as follows:—

## MEMORANDUM ON SPECULATIVE PRICES IN TENDERS.

WHAT has been called "rigging a schedule" is a practice which, to a moderate extent, is very common with contractors and cannot well be prevented. Government Departments and Engineers discountenance the practice, but it is extremely difficult to disqualify tenderers for Public Works on that account, nor do I know of any instances in the other colonies where this has been effectually accomplished. The great objection to interfering with public tendering in this respect lies in the danger of striking at the important principle of fair and open competition, and the acceptance of the lowest tender.

Thus in attempting to avoid one evil, which is of a small extent, the authorities might run into a far graver one, which would be certain to raise an outcry among contractors and give rise to suspicions of favouritism.

Nor is it by any means easy, at times, to draw the line clearly between genuine and speculative prices for work, as so many circumstances have to be taken into consideration in making up a tender.

I can speak from considerable personal experience on this matter, as I have acted as engineer and manager for several leading firms of contractors in Australia, during the past twenty years, and have had many occasions of noticing how these things are managed. The process usually adopted is as follows:—

A contractor in making up his tender begins by setting down prices for the different items from his own practical knowledge of the cost of similar works elsewhere, or from such outside information as can be obtained on all the points involved. The list represents the actual cost of the works as far as they can be correctly estimated.

But it must be borne in mind that most of the data for such estimates are more or less uncertain, and that the expense depends on a variety of circumstances and contingencies, such as the time allowed for carrying out the work, the weather, the prices of materials, which are constantly varying, the fluctuations in the labour market, with the possibilities of strikes, the cost of plant and machinery, and many other things.

Then allowances have to be made for risk, delays, supervision, office charges, and the expense of management, bank rates, or interest on capital, and the contractor's profit. All these elements of cost have to be included in the schedule rates; they are sometimes spread as evenly as possible over all the items, raising the prices generally by a certain percentage, or else they are lumped on to a few special items, which may appear in consequence out of all proportion to the other prices.

Thus certain prices in a schedule may seem highly speculative when in reality they are not so.

From this amended schedule of prices the lump sum of the tender is obtained, and this amount is not afterwards varied.

The schedule, however, may be altered in many respects without affecting the total, and this is done for various reasons.

Sometimes a contractor is short of money, or it may be a matter of great importance to him to obtain as much payment as possible at the start of the job. To effect this, the prices for such items in the schedule which are likely to be carried out in the early part of the contract are largely increased, at the expense of other portions which generally stand over to the last.

Thus "clearing" and "fencing" are often rated very highly because these works have to be done at the start.

Then, in the schedules for important works a multitude of items are put down, which the contractor may have to do work under, but which are not always required. The contractor has no certain information to go upon, and he is therefore to some extent justified in putting down speculative prices. For instance, bridges and culverts may be ordered to be constructed of stone, brickwork, concrete, timber, or iron, and the engineer generally reserves to himself the full right of ordering any of these, or of altering the design from one style of construction to another, in any place and under all conditions. Now, the cost of works will vary very much according to the site and under varying conditions. It is quite necessary that such a power to alter the contract should be vested in the engineer, but it is difficult for the contractor to price the different works fairly under such circumstances. The element of risk is largely increased, and it has to be met. There is something to be said on both sides.

Of course the tendency is to modify the first draft of the schedule so as to increase the prices for such works as are most likely to be carried out, and to take a corresponding amount off other items which may not probably come into operation. If this is done to a moderate extent only, no reasonable exception can be taken to it, as by the provisions of the contract the tenderer is left in considerable uncertainty, but when the practice is carried to extremes it becomes highly objectionable. A contractor may back his judgment in framing his schedule. I will give an illustration from a case that came under my own knowledge. We will say that a long railway cutting, containing 20,000 cubic yards, and worth about 2s. 6d. a yard to take out, leads to a station-yard containing 5,000 cubic yards of light earthwork, worth about 1s. 6d. a yard only. The contractor, rightly judging that the station-yard will need to be largely extended, alters his first schedule rates so that the hard cutting is priced at 2s. a yard, and the station earthwork at 3s. 6d. The totals in both cases remain the same, viz., £2,875; and should no alteration take place in the original design there would be no difference in the cost to the Department. But the anticipated extension of the station-yard does occur; it is increased to four times the first quantity, and the contractor therefore makes a clear gain of £1,500 by the alteration.

It is a very common practice to put high prices on certain items which generally exceed the scheduled quantities, such, for instance, as side-cutting. I have known side-cutting rated higher than the heavy earthworks, although the latter would cost twice as much to take out. Sometimes, however, these speculative prices tell very much against the contractor. I knew one who, in his schedule, put cement down at 1s. a cask. It was not anticipated at the time that any cement would be needed on the works. Unfortunately for the contractor a considerable quantity of that material was ordered, and had to be supplied at this very unremunerative rate. Thus speculative tendering cuts both ways, and as a rule experienced contractors are very shy of adopting such methods on a large scale. Judging from my own experience for the past twenty-five years I do not think that much loss has been sustained by the Public Works Departments through speculative tendering. Some smart contractors have occasionally scored well by the practice, while others have lost heavily, and, upon the whole, the cost of the works has not been materially affected. Nevertheless the practice is a bad one, and should be checked as far as practicable, without interfering with fair competition. The plan that Mr. Hickson lately introduced for pricing schedules strikes me as the best attempt in this direction that I have ever known made.

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16557. Did you look at the schedule for Contract 69 of Messrs. Carter, Gummow, & Co. and the prices it contained? I glanced through them.

16558. You noticed the item "bluestone pitching"? Yes; £50 a sq. yard.

16559. What would you say as to that? It is the most extravagantly priced item I have ever known.

16560. Do you think the presence of that price in the schedule would of itself justify the throwing out of the tender? No; I do not think so from my knowledge of the course generally pursued in the other colonies. It becomes a question as to where you are to draw a line. I have never known a line to be drawn at any particular price, and it would be very difficult to say that, if such and such a price were given for such and such items, a tender should be rejected. I do not see how you could possibly apply such a principle.

16561. Has your attention been drawn to the minute with regard to the striking out of this work when the mistake was discovered? Yes.

16562.



16562. Let me direct your attention to the minute which is printed upon page 382 of the evidence, and which is attached to Mr. Christie's memorandum No. 17; you will see Mr. Davis' minute and Mr. Hickson's ruling upon it? I think Mr. Hickson adopted the proper line of conduct. It is in accordance with the course which I have known to be taken elsewhere. G. Chamier.  
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16563. You mean where he says that in fairness the item could not be omitted? Yes; I think the Department having accepted the contract as it stood was bound to act up to it.

16564. With regard to the clauses referred to by Mr. Christie in this connection, and which appear upon the next page of the evidence, you will see two clauses No. 16 and No 17. Clause 16 empowering the engineer to substitute one class of the work for another, and the other clause being as to the omission of work. Those are ordinary clauses in Government contracts? Yes, they have been included in nearly all the specifications I have seen. They are not applicable I think to a matter of this sort.

16565. From what you know with regard to tendering here the practice is for probable quantities to be taken out by the office, and for tenders to be invited upon those prices? Yes, that is the practice, the quantities not being in any way guaranteed by the Government, and many of them being put in merely for the purpose of getting a price.

16566. Suppose a contractor who was tendering had an agent in the Department who was supplying him with information, would it be possible for him to obtain information in that way which would help him in the rigging of a schedule? Not that I am aware of. I do not see how private information could help a contractor at all in a matter of that sort.

16567. As a matter of fact all that is known to the Department is put forward in the probable quantities? That has been my experience; and frequently the alterations which have taken place have not been thought of at the time the contract has been let.

16568. In the case of these Government contracts moreover, it is not known who will be the engineer to supervise a particular contract? No. Frequent changes are made in the *personnel* of the Department, so it would not do for contractors to rely upon having any one man to deal with a particular work.

16569. It would not be possible you think for a contractor to get information of the kind I have indicated from the Department with the result that he would be put in a better position in tendering than would other contractors? I do not think so. Of course contractors always try to get as much information as they can, but I do not see how information from the Department would help a contractor in a case such as you refer to.

16570. So that even if there were collusion you do not see how that would assist in bringing about successful rigging? Not unless there were collusion with the Engineer-in-Chief.

16571. Who would have control of the job all through? Yes. Of course collusion with him might lead to any amount of corruption, but not in the case of any subordinate officer.

16572. In the course of your experience I suppose you have seen the arrangements which contractors have made with regard to their bonds and securities? Yes. There is not much of that done, as a rule, in the Public Works Departments in these colonies. It is very common in England, but here it is not the rule to accept bonds at all.

16573. But where bonds are taken, is it or is it not a usual thing for the sureties who lend their names to get something for it? They generally get a percentage on the profits. That is the consideration.

16574. With regard to this Monier system which we have heard so much about, have you ever seen any work of that kind? I have inspected the work which is being done at Johnstone's Creek.

16575. But have you studied the system itself? From books and from reports of work of this kind which has been carried out in Europe and in America. The work at Johnstone's Creek is the first work of the kind which I have actually seen carried out.

16576. What is your opinion of the system. Do you think it is a system which can be introduced with advantage? I do. I think it is a system which can be used with great advantage in many classes of work.

16577. You think that it is of a durable nature? I have always had a very high opinion of cement concrete. I have myself built a large number of works in cement concrete—culverts, dams, and such like, and I think the introduction of iron will be a great improvement. The system will enable the works to be carried out much more economically. Personally, I have very great faith in it.

16578. You know what has been done in regard to the work you inspected on Contract 77—you know the precautions which have been taken with regard to throwing the risk on to the contractors—what have you to say to that? As a rule, I should not approve of the principle of throwing the risk on the contractors, because I do not think it is a fair thing to do; but, in this case, the efficiency of the work resting so much on the quality of the workmanship, and the soundness of the work being the main consideration, I think it is quite a proper thing to do, that is, to throw an exceptional risk upon the contractors, making them responsible for the whole work.

16579. Do you think that three years is a sufficiently long period for which to require the contractors to guarantee the stability of the work? In three years time cement concrete always attains its greatest strength. It is not known to increase in strength after that period, consequently, three years would be ample to test the work in every respect.

16580. With regard to the security taken—the amount of the contract itself is £15,500—that being so, would you think that two sureties of £6,000 and a bond of £12,000 would be a fair thing in addition to a fixed deposit? It is a great deal more than is usual. It is nearly double the amount required.

16581. You think that that is a reasonable arrangement to make in conjunction with the throwing of the responsibility on to the contractors? I think it is almost excessive.

16582. *His Honor.*] That is even as regards the whole of the work; but, in point of fact, the amount of £15,500 is greatly in excess of the value of the portion in which the risk is involved? Quite so.

16583. *Mr. Smith.*] Did you ever hear of a similar instance? A case occurred in Adelaide, about sixteen years ago, which was somewhat similar. There were large gaps on the Nairn line of railway leading from Adelaide up to the hills, which had to be crossed. Bridges and embankments of the old type would have been costly, and an American firm offered to cross these gaps with the light trestle-work viaducts which are so well known in America. The system was quite unknown in the colony, but it was considered to be of advantage to have a sample of that class of work, and accordingly the contract was given to this American firm without tendering. The actual cost of the viaduct was rather lower than the cost of bridging the gaps in the ordinary way; but the prices for ironwork were nearly double the



- G. Chamier. the ordinary bridge-work prices upon the English system. That instance seems to correspond, to a certain extent, with the adoption of the Monier system upon this contract; and in this way—the price of the work may be considered excessive, but the lightness of the structure makes up for it. The viaducts to which I refer were regarded with grave suspicion at the time. In point of fact, I remember that some years afterwards a motion was made in Parliament to have them all pulled down and embankments substituted. It was thought that the public would never be convinced that they could with safety travel over such light and apparently spider-web structures. The motion was not carried, and, as a matter of fact, the viaducts are perfectly safe, although they may not look so.
- 9 Sept., 1896. 16584. That particular contract, I understand, was let without tendering? Yes; in order that the new system might be introduced into the colony.
16585. Have you examined the work upon Contract 77? Yes; I have been there on two occasions, and I have also examined the plans.
16586. What would you say as to the way in which the work is being done? It seems to me to be done remarkably well. The quality of the material also seems to be excellent.
16587. You say you looked at the plan as well as at the work itself;—what have you to say with regard to the margin of strength and all that sort of thing? I did not go minutely into the calculations of strength, but I satisfied myself that the work was amply strong for the purpose. I think it would have a margin of strength of at least 6 or 7.
16588. You have no reason whatever to doubt the stability of the work that is being done there? Personally I have not. At the same time, it must be admitted that the engineering profession was shown a little doubt on the subject, judging from the tenor of the discussions which have taken place. Personally, I have no doubt whatever as to the system.

FRIDAY, 11 SEPTEMBER, 1896.

George Chamier recalled and further examined:—

- G. Chamier. 16589. *Mr. Smith.*] At the conclusion of your examination on Wednesday you were speaking of the Monier system;—have you made any kind of estimate as to the cost of the Monier work which you saw in Contract 77? Yes.
- 11 Sept., 1896. 16590. First, as to material, did you obtain any quotation as to values, or what did you do? I obtained the best information I could on the subject, and I valued it principally upon my former experience in somewhat similar work.
16591. Did you go through your estimate more than once? I have been through it carefully.
16592. What do you make the cost of the work per cubic yard? I make the total cost of the compo. in place £4 a yard.
16593. *His Honor.*] Including the ironwork? Yes; and all charges that might fairly be put down to the contract.
16594. *Mr. Smith.*] It includes charges for patent rights, and also for the risk and guarantee for three years? I have gone upon the basis upon which I should have gone had I been called upon to make an estimate for a contractor doing the work.
16595. Did you obtain quotations for the material? Yes.
16596. Did you take the highest or lowest quotations, or what did you take? I have taken very low values.
16597. As to the labour,—what did you put down for that item? In the item “labour” I have included mixing, screening, wheeling to site, ramming in place, the fixing and removal of the lagging and side-boxing moulds, and small centering, also the fixing of the ironwork in position. I have put the whole down at 12s. a yard.
16598. How did you arrive at that? The only way in which I could arrive at it was by comparison with the cost of concrete work which I had carried out elsewhere, allowing for the difference in the amount of labour. This is quite a special work, involving more labour in the concrete itself, and a great deal more in fixing the timber and the iron grilling. The estimate is based mostly on prices which I have known to be paid for work of a somewhat similar character. The only correct way of getting at the cost of the labour would be to take the time of the men from the pay-sheets. I do not attach much value to an estimate of this sort, although I have taken great care with it.
16599. We have had an estimate from Mr. Davis as to the value of this work, in which he says that, taking the actual time, it would be 17s. 8d. a yard;—what would you say as to that? I should not be at all surprised to find that the work cost that.
16600. You think that would be a better estimate, taken from the actual time, than your own? Estimates of this kind are always uncertain. Of course, if you go to the pay sheets you reduce the cost to an actual certainty.
16601. So that by adding the extra 5s. 8d. your total would be brought up to £4 5s. 8d.? Yes.
16602. What was the amount which you said you had put down for the patent rights and risk? I find it very difficult to estimate. There is an exceptionally heavy risk—quite an unusual risk—thrown on to the contractors in this case, with a guarantee to rebuild the whole work if it shows any flaw whatever within three years, coupled with three years maintenance. Looking at it from an outside contractor's point of view, I have allowed 20 per cent on the actual cost of material and labor, and that comes to 11s. per yard.
16603. If you take that off the £4 5s. 8d., what do you get? From a contractor's point of view, I should strongly object to its being taken off, because I consider it a most essential part of the estimate.
16604. Did you look at the evidence given to the Commission by Mr. McCredie? Yes; I remember reading it through.
16605. Let me direct your attention to what he says in reply to Question 2629, as to the value of the compo. He says, “I make it up in this way: take 3 yards of sand at 2s. 6d., that would be 7s. 6d.”—what have you to say as to that? That is much below the value I put upon it. The strength of the concrete depends materially upon the quality of the sand. My estimate contemplates the very best class of sand that can be obtained—the best crushed sandstone—which I have put down at 7s. a yard. I think that a moderate estimate.
16606. In view of the finer sand which you would have to use in this particular work? Yes; it makes a considerable difference—a difference of 30 per cent. in the strength of the concrete.
- 16607.

16607. Then with regard to the other items, as to labour, for instance, he said "I allow 8s. 6d. for labour, covering, timbering, mixing, and everything in connection with it"? I should be very sorry to undertake a contract upon such an estimate. The cost of labour in ordinary concrete work which we put into walls or culverts is always reckoned at from 5s. to 6s. a yard—that is a standard rate; in fact, it has generally cost in work in which I have been engaged about 6s. There are a host of other items to allow for—office expenses, management, platforms, water, moulds, centering, scaffolding, and use of plant. Contractors' profit is generally put down at 15 per cent. So that if the 8s. 6d. is intended to cover the whole, I am afraid you have a basis upon which few contractors would care to undertake the work.
16608. So you do not agree with Mr. M'Credie in his estimate? I entirely disagree with him.
16609. He makes his total £1 10s. a yard? Mine is £4, so there is a difference of £2 10s. between us.
16610. I will ask you to turn now to Mr. Bagge's evidence on page 45. You will see that in reply to question 1635 he appears to adopt an expression used by Mr. Parkes. Mr. Parkes said, "It was your opinion that it would not be safe to construct the work on a risky patent," and Mr. Bagge says, "Exactly." I suppose you would not call it a risky patent? It is not risky. It is to some extent experimental; but we have seen such excellent reports of Monier work which has been constructed elsewhere, which has been subjected to heavy tests, that I am not inclined to consider it a risky experiment at all.
16611. If you turn to another portion of Mr. Bagge's evidence, upon page 47, you will see that in reply to question 1705, Mr. Bagge says that they tried to make a calculation as to whether the centre line of resistance would keep within the middle third of the arch ring, but that the key was not given them. Again, in reply to question 1742, he refers to the key, and says, "I told you that we had not the key in making our calculations." What have you to say as to that? I never before heard of a key to any calculation. The only sort of key which applies to arch work would be the depth of the keystone. I do not know whether that is what Mr. Bagge refers to, but certainly there is no key in ordinary calculations as to the strength of an arch. I really do not know what he means by the expression.
16612. As to the keystone itself in the arch, what have you to say as to that? The depth of the keystone in the arch cannot be obtained by calculation. The best mathematicians have, I believe, given up the attempt. A scale is adopted which has been obtained from practice, and which is recognised as safe. It varies generally from about 2 feet in depth in small arches to 4 feet in very big ones, and there is no particular co-efficient required, or anything which you could regard as a mysterious number which would have to be discovered in the matter. It depends purely upon the result of experience.
16613. With regard to the Monier system, how would you go to work in building an arch upon that principle? An arch upon the Monier system admits of being calculated much more closely, because it is a homogeneous mass. The necessity for allowing such great extra strength in the case of brickwork and masonry lies in the fact that there is a certain amount of uncertainty as to the strength of the different parts. They are not all exactly alike, and they sometimes do not fit together with the greatest nicety, but in the case of the Monier you could work it out as you would an iron arch with the pressure on the material. That is the reason why the system admits of being cut so fine.
16614. I suppose you would work upon experiments made all over the world? The experiments which have been made would give any clue that is required. That is the only key I can understand in the matter—a key obtained from actual practice.
16615. The practice being the number of experiments made in various parts of the world? Yes. The engineering journals are full of accounts of experiments in different countries.
16616. And in these experiments I suppose you always have exact dimensions and various tests of strength? We have everything required to arrive at correct results.
16617. Upon page 46 of his evidence, Mr. Bagge, in reply to question 1666, refers to the necessity for specialists in connection with a work of this kind. What have you to say as to that? I think he is putting forward a bugbear of his own imagining. There is no very special knowledge required in the matter. Of course the work wants care and the use of good material, but there is no mystery about it. There is no difficulty in making first-class work.
16618. You will see that, in reply to question 1674, he refers to special cement? That is another of his objections, and I think it is a very frivolous one. There is no such thing as special cement. A number of manufacturers vie with one another to produce the best article. The quality is determined by actual test and experiment. You can obtain just as good cement in Australia as in Germany or anywhere else. It is sold in the open market. It is entirely a question of test of strength. There is no particular brand that I know of which should be taken in preference to another.
16619. As to the tests applied in this colony, how do they compare with tests applied in other parts of the world? They are just as severe. I have read accounts of French, German, and American, tests, and I find that ours are quite as severe. The tests are published all over the world, and you will find manufacturers boasting that their cement will stand so many lb. to the square inch after a certain number of days. We know perfectly well what to expect in the matter; there is no mystery about it.
16620. Replying to question 1674, Mr. Bagge says that the arches must be carried on night and day until they are completed;—what have you to say as to that? I can see no earthly object in that.
16621. *His Honor.*] If what Mr. Bagge meant was that each individual arch had to be constructed in one piece, I suppose you would quite agree with that? Yes; but if he meant that the whole aqueduct had to be constructed in one piece, I can see no earthly object in it. He says in one place that there would be a fear of one arch toppling its pier over. That is absurd, because the centering takes the weight while the arch is in construction, and the same thing will apply to any class of construction—to brickwork and stone, as well as cement concrete.
16622. *Mr. Smith.*] If you turn to question 1779 you will see that Mr. Bagge makes the following statement in reply to Mr. Gummow: "What I mean to say is that you have to start a number of arches at the same time. You also have to start the cement work at both ends of each arch simultaneously. The work must continue until it is closed in the centre. It must go on night and day. It will not do to have any dry joints. There must be no joint in any part of the structure."? I cannot understand how he arrives at such a conclusion. I think it is important that every arch should be carried out without dry joints, but certainly not a series of arches.
16623. What have you to say with regard to advances to contractors. Have you heard of that being done on any of the contracts upon which you have been engaged either on behalf of Governments or contractors? Yes. A demand is generally made by contractors before the work has proceeded very far that

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G. Chamier. that certain moneys held back should be returned to them. The practice in the other Colonies as far as I know—I am certain it is the case in South Australia—is that when the retention money amounts to the full sum of the deposit the deposit can be returned, the retention money being taken in place of it. There is a clause to that effect in the specification which I now produce. It is the specification of the railway from Nairn to the Victorian border. It is one of many specifications in which the same clause occurs.

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16624. *Mr. Parkes.*] Is that a Government specification? Yes.
16625. Compiled under you? No; I happened to have it in my possession.
16626. *His Honor.*] What is the date of it? 1st February, 1884.
16627. Was it a big work? A very important work, leading from Adelaide over the mountains to the Murray. I have a number of other specifications with the same clause.
16628. *Mr. Smith.*] Is it a usual clause? It is usual to the best of my knowledge.
16629. You are referring now to the clause relating to the return of the deposit money when the retention money amounts to a similar sum? Yes.
16630. And that you say is the usual practice? Yes; I have generally known it adopted. Then, of course, in reference to the retention money, too, it is a common occurrence for contractors to apply to the Department to have the money returned to them when the work is well advanced and when the Department has ample security in other respects, such as plant and material on the ground. When the Department considers that the Government has ample security, it has never in my experience made much difficulty in returning a portion of the retention money.
16631. *Mr. Gummow.*] You referred to the viaducts on the Nairn Railway as being a parallel case with the adoption of the Monier system in Contract 77? Yes.
16632. To what use is the viaduct to which you refer put? To carry the railway.
16633. For passengers? Yes.
16634. So that in that respect it is not a parallel case with our work? I alluded to it as the nearest approach to anything of the sort which had come under my notice.
16635. But the structure was regarded by some of the public as a dangerous looking structure, having regard to the fact that the railway running upon it had to carry passengers? Yes.
16636. There being a greater risk, if there were any risk at all, in using it in that way, than there would be in using these Monier arches for the carriage of sewage? Of course there was only a sentimental grievance against it. People did not like the look of it, and some objected to travel on the line. The viaduct certainly looked very rickety and flimsy.
16637. As to your memorandum upon speculative prices in tendering, you have set out a number of reasons as to how contractors put in prices upon the schedule items—I suppose that very often one schedule item depends upon another in its use and requirements? Yes.
16638. For instance, if you are doing tunnel work which has to be lined with brick and concrete or in which timber has to be left in, then before the lining of concrete and brickwork can be put in or before the timber can be put in a certain amount of excavation has to be taken out? Of course.
16639. If the brickwork is increased from one ring to two-ring work, must there not be a corresponding amount of excavation taken out to permit of the second ring of brickwork being put in? Yes; as a rule the excavation is sufficiently beyond the actual net size to allow of one or two rings of brickwork. It would not alter the design in the carrying out of the tunnelling.
16640. But if you are ordered to drive a tunnel for two-ring brickwork instead of one-ring brickwork, and if you are paid by the cubic yard, you would get paid for the extra cubic yards involved in the two-ring work? You would be paid for any extra excavation there might be.
16641. In that case a contractor, looking at the brickwork item, would say "if they order any more brickwork they must pay me for a corresponding amount of excavation"? Yes.
16642. A similar case would be where the timbering is left in and paid for—there must be a sufficient area taken out by means of excavation to cover the space occupied by the timber? Yes.
16643. So that that is taken into consideration by the contractor. He may have certain prices for timber, brickwork, and concrete; but those items cannot be used unless the extra excavation be taken out? That is so.
16644. As to the Monier arch. In calculating the strength of the masonry arch, do you use the theory of an elastic arch in making out your calculation? No.
16645. Do you in the case of an iron arch? Yes.
16646. In calculating for a Monier arch, would it come under the heading of the theory of an elastic arch to a certain extent? It would; and that is the reason why it allows of being made so much finer in dimensions.
16647. So that you have probably two or three or more methods of arch calculation in this class of work, seeing that it applies partially to masonry work, and partially to the system of iron arches? Yes; but I may say that in all work of this sort engineers rely mostly on the results of experience. In the case of iron, we can find out the strain on every bar exactly. You could never do that in any class of masonry.
16648. What is the reason you cannot do it in the case of masonry? Because masonry is only calculated to stand one kind of pressure—the compressive strain.
16649. And it has joints? Yes; which you never rely upon.
16650. They are not of the same nature as stone itself? That is so.
16651. With regard to continuity in construction—do you know of the use of this Monier system for warehouse floors, and work of that description? I have read most elaborate accounts of its being used in a variety of ways, and that is one of them.
16652. Do they in the case of floors use girders, and put this work in as a sort of jack arch between the girders? That is the design I have generally seen.
16653. Could there be continuity over the whole floor or would it not be broken by the web of the girders? It would be broken of course.
16654. There would be no continuity in the case of floor construction? No.
16655. And as regards viaducts and aqueducts and that class of work continuity is equally unnecessary? There could not be continuity in any case, because you must allow for expansion joints.
16656. As to returning the deposit and retention money to the contractors—do you consider that as regards future work contractors will take it into consideration if they find that a Government will assist them

them financially as far as practicable? I have frequently found that Governments—speaking of the other colonies—have wished to impress contractors favourably as to the manner in which they were going to treat them. If a Government were very harsh with contractors and took advantage of the specification they would find the contractors less anxious to do work for them. G. Chamier.  
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16657. The tenderers would probably put their prices higher if they thought the trouble to which they would be put would be greater? They would.

16658. So that indirectly it is of benefit to the Department to assist contractors? I think so. From a contractor's point of view—certainly.

16659. *Mr. Parkes.*] When did you leave South Australia? I think in 1890.

16660. What work did you actually carry out over there? When I left South Australia I had been acting as chief engineer for C. & E. Miller, the large contractors. I had been engaged on works in South Australia, Western Australia, and in the Northern Territory.

16661. How long were you in South Australia altogether? About 12 years..

16662. What work did you actually carry out there yourself? Several lines of tramway. I carried out the Parkside tramway, the Hyde Park tramway, and the Glenelg to Merino line. I superintended the construction of the Torrens dam, and I also had the Grange railway. I acted as consulting engineer for several firms of contractors who were carrying out large works at the time.

16663. Were these works Government works? No; not all of them.

16664. Were you in sole control? No; I was consulting engineer. The works to which I have referred were carried out by private companies. The Torrens dam was under the City corporation.

16665. What sort of material did you employ in that dam? Cement concrete.

16666. Was it a reservoir? It was a big dam across the bed of the Torrens, in a central position, near the city. It formed a sort of artificial lake.

16667. What work have you done in this Colony? I have simply acted as consulting engineer for firms of contractors. I have not carried out any works.

16668. You said you had had experience of a similar class of work to the Monier work;—will you describe what it was? The nearest approach to it was on some of the South Australian railways, where culverts were built of concrete. On the North-west Bend line most of the culverts were of concrete.

16669. Of what size would the arches of the culverts be? They would run from 2 feet to 10 feet.

16670. There was no iron associated with the concrete? No.

16671. Have you had any experience of work in which iron has been associated with concrete? Not with concrete; but I have seen a good deal of hoop-iron used in brickwork.

16672. Have you found that concrete in large bulk above ground shrinks? I have never heard of any shrinking in concrete. There is a certain amount of contraction and expansion. I do not see how shrinkage could take place. It is a hard brittle material.

16673. Is there much contraction in concrete after it once sets? No; I have not known of any shrinkage at all. There is a slight tendency to expansion in setting.

16674. Does it never contract after setting? I have never known of such a case.

16675. The cracks would occur from shrinkage, would they not? You cannot have any shrinkage in concrete; it is just as impossible as it would be in the case of glass. It is a hard, brittle substance. There may be cracking due to contraction and expansion from cold and heat. I believe that cracks have occurred in masses of concrete from that cause.

16676. You referred to a clause in the South Australian specification relating to the refund to contractors of retention money;—did you ever hear of a refund before the completion of the work or the expiry of the term of maintenance? What the clause provides is that when the retention money equals the amount of the deposit the deposit may be returned.

16677. Practically, then, the retention money takes the place of the deposit? Yes.

16678. Therefore the Government would have still a deposit in hand? Yes.

16679. You referred to the Nairn railway and the viaducts upon that line? Yes; the viaducts I alluded to are built upon the American trestle system.

16680. They are of iron, not concrete? Of iron.

16681. So that there is no comparison between that work and the Monier work? No; I was comparing the principle of the thing, not the work itself.

16682. You said you saw no difficulty whatever in doing first-class Monier work—that there was no mystery or impediment in connection with the system? That is my opinion.

16683. Therefore, under an engineer who understood the system, any contractor could do the work? Any contractor could do it provided he exercised the necessary care in the execution of the work.

16684. Provided the work were properly supervised? Yes.

16685. How long have you been in this Colony? I think a little over six years.

16686. You have not carried out any actual work here? No.

16687. You have acted here as consulting engineer? Yes.

16688. When you were in Adelaide do you recollect any inquiry into public works? There were so many. There was an inquiry going on nearly every year.

16689. Do you remember an inquiry by Royal Commission in 1880? I could not recollect it merely from the date. Perhaps you could tell me what the inquiry was about.

16690. Do you recollect a complaint as to the cost and defective nature of the public works in 1880, and a Commission of Inquiry being demanded? I really could not remember the circumstances, unless you gave me more details. There were so many inquiries. I myself gave evidence upon several of them, but I could not now specify any particular one.

16691. Did you not give evidence before the Commission which sat in 1880? I think I did. I was generally asked to give evidence when an inquiry was in progress.

16692. I refer to the Commission which remodelled the service? I could not identify it from memory.

16693. Do you recollect giving information before the Commission in 1880 concerning the mode of schedule tendering? It is too far back; I cannot be sure as to what took place speaking from memory.

16694. Do you recollect pointing out to the Commission the danger of schedules which contained imperfect quantities? I may have done so; it is very likely that I did, because it is a subject which I have often thought about.

16695. Do you recollect telling the Commission that schedules prepared in that way allowed of an engineer

G. Chamier. engineer ruining or benefiting a contractor according to his will? I cannot remember that particular circumstance you allude to, but it is quite possible that I said such a thing. No doubt it is in the power of an engineer-in-chief, under the form of contract you allude to, to make a contract almost ruinous to the contractor.

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16696. You advocated a change to stop any chance of what you term probable corruption; you advocated that at any cost the full data should be given to the contractors? I cannot remember the circumstance, but I do not see anything unlikely in my having said so.

16697. Do you recollect the form of schedule in South Australia? What I objected to, if I remember rightly, was this—that you placed the contractor in a difficult position where you asked him for prices (say) for a few yards of material, and where the engineer reserved to himself the right to order a change in the work without stating in what position the material was to be placed. It makes it exceedingly difficult for a contractor to price the work accurately under those circumstances. That is what I had in my mind; but I could not speak as to the wording of any particular answer which I gave at the time.

16698. Do you recollect stating that schedules of the description referred to allowed the engineer to substitute brick for stone or stone for brick, and so alter the material as to ruin or benefit the contractor? I do not remember making that particular statement, but it would be quite possible for an engineer to do what you say under the conditions named.

16699. There can be no doubt, therefore, but that the fullest data should be given to contractors? I think it is very advisable, and from the contractor's point of view I have always asked for it.

16700. Do you think that a contractor's tender ought to be accepted if it be clearly denoted on the face of it that the contractor is imposing upon the nature of the schedule which has been given to him? There you open up a difficult question, and I am not prepared to express an off-hand opinion upon it. The difficulty is that the public and the contractors expect open competition, and immediately you begin to raise points and restrict the contractors within certain limits you will raise a cry of favouritism and under-hand dealing. It seems to me that you are between two difficulties.

16701. But you did point out the danger attending this particular form of schedule to the South Australian Commission? I really cannot remember the evidence I gave on that occasion. It is a long time ago. There is considerable objection from the contractor's point of view in having to give prices without proper quantities being attached. It may lead to a very great loss. Take a railway contract. The specification may give a certain number of timber culverts in places where timber would be plentiful and they would be priced accordingly. The Engineer-in-Chief has full power to strike out that item and to substitute concrete and brick-work. Bricks might not be easily obtainable, and under those circumstances the work might be rendered almost ruinous to the contractor.

16702. The clauses in the specification are generally taken by the engineer literally, are they not? Well, from the contractor's point of view we do not look at it in that way. We bring in equity, as far as possible. If I were arguing the point before an engineer-in-chief, I should certainly ask him not to take the literal meaning of a clause in the specification, but to have regard to what is right between man and man. We take as little notice of the specification as we can.

16703. But ought not a specification to be prepared with that conciseness which will admit of its being accepted literally? I have heard a leading engineer say that a specification is meant for rogues. That is the basis upon which they are drawn up. They are never meant to be applied absolutely. They give enormous power to the engineer, which may be rightly exercised at times; but in the case of honest contractors, who do their work well, the specification is not enforced literally.

16704. You take the matter in this way—that an engineer is an arbitrator, who uses his discretion as to what is equitable between employer and employed? Yes; that is the view I take.

16705. *His Honor.*] Have you gone into the question of the watertightness of cement and concrete? Yes; I have had a good deal of experience in that matter, having built a number of dams and other works in concrete. I have seen a good deal of concrete work.

16706. What is the result of your experience? My belief is that concrete itself is slightly porous; in fact, experiments prove that water under considerable pressure will ooze through it, without, however, doing it any harm. After a short time the pores get filled in, and it becomes watertight of its own accord; but, by rendering the concrete with cement mortar, you can make it almost as watertight as any material that can be used—in fact, it is usually considered thoroughly safe. One-to-one mortar is almost as watertight as any material you could put on a wall.

16707. *Mr Parkes.*] Who asked you to come and give evidence before this Commission? Mr. Hickson.

16708. You knew Mr. Hickson well in South Australia? Yes, I have known him for the last seventeen years.

16709. You are a good old friend of his? Yes.

16710. *Mr. Smith.*] While you were in South Australia did you ever hear anything against Mr. Hickson—that is as to his capacity or his integrity? I never heard anything that I thought worthy of taking notice of.

16711. Have you as consulting engineer ever done anything for Carter, Gummow, & Co.? No.

16712. Do you know them at all? I do not think I have ever seen them at all.

16713. *His Honor.*] I understand that you are now practising privately? Yes.

16714. You are not in any way connected with the Department? No; I have acted for the Department in some arbitration cases, and also against the Department. I am not in any way bound to the Government. I would take a brief against them to-morrow if it were offered me.

Joseph Davis recalled and further examined:—

J. Davis. 16715. *His Honor.*] You desire to make a statement to the Commission? Yes. It is in reference to the list of cases in which the fixed deposit had been returned to contractors. Having looked into the matter, I find that there are three cases in the Sewerage Department in addition to the two cases mentioned in the list which has been already handed in. One is Contract 80, Messrs. Parry and Farley's, the amount being £1,100. Another case is Contract 75, Messrs. Parry and Farley's, the amount being £300. The third case is Contract 64, J. Carson's, the amount being £5,000.

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16716. *Mr. Parkes.*] Would that be the total number of cases? I could not say positively; there may be others. I have not been able to discover any more. It is very difficult to get some of these old papers.

16717.

16717. Could you give the dates prior to the completion of the contracts you have named at which these moneys were refunded? The papers in the cases of Contract 64 were laid upon the Table of the House last night, and we cannot therefore refer to those. The books show, however, that the deposit was returned on 30th July, 1894, and that the final voucher was paid on 6th May, 1896. As to Contract 75 the deposit was returned on 19th of May, 1892, and the final voucher was paid on 9th December, 1892. In the case of Contract 80 the deposit was returned on 2nd November, 1893, and the final voucher was paid on January 8th, 1894.

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16718. The final voucher is not always paid for something like six months after the contract is completed? It is due when the contract is completed.

16719. But have you in every case paid the final voucher when the contract has been completed? The date of the final voucher is usually the date of the expiry of the maintenance period, which is regarded as the date of the completion of the contract. In the case of Contract 64 there was some delay in paying the final voucher on account of a claim that was pending. That accounts for the long period which elapsed between the date of the return of the deposit and the payment of the final voucher. The deposit in that case, however, was repaid before the work was completed.

16719½. You hand in a statement showing the contracts of Carter & Co. and Carter, Gummow, & Co., the dates of signing the contracts, and the dates of the payment of the final vouchers? Yes; that statement has been prepared by Mr. Hungerford.

Robert George Reid recalled and further examined:—

16720. *Mr. Parkes.*] When you were an inspector upon Contract 79, were you on duty at night or in the day? I had night-work.

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16721. At the time you complained of the men putting dry stone down the shaft, were you on night-work or day-work? I was on night-work. I went on at 4 o'clock in the morning, and sometimes a little before, and came off at 8. Then I went on at 4 in the afternoon and came off whenever I had finished.

16722. When you complained to Inspector Fowle, what time of day was it? It was half-past 6 in the evening when I wrote out my report.

16723. At what time did you go off in the morning? I went off in the morning at about 8 o'clock.

16724. Were you on duty all night? I went off at 8 o'clock and came on the next morning at 4 o'clock.

16725. After you had sent in your report, when did you next see Inspector Fowle? I am not so sure that I saw Inspector Fowle on that particular day. I should imagine that he would get my report at about 9 o'clock.

16726. Did you see him during the day? I think I must have seen him that day. If he had had anything special to see me about he would have come to my house.

16727. Did you see him on the job? I could not say whether I saw him on the job. On some days I would not see him at all unless he had something special to see me about.

16728. Did he ask you to go down a certain shaft with him? He did not.

16729. Do you know that he went down the shaft on the day following your report? I did not know it.

16730. Until when? Until I read it in the *Evening News* the other day.

16731. He did not request you to go down and see the work—he never asked me to go? Connors asked me to go down on the night upon which I made my report at half-past 6, but Inspector Fowle was not there then.

16732. You are positive that you did not decline to go down? I certainly did not decline to go down; and if His Honor wishes it I will prove that inspector Fowle never asked me to go down. In connection with the report which I sent in in reference to the men sending down dry material, Mr. Davis, Mr. Boys, the resident engineer, Mr. Carter, Mr. Snodgrass, Inspector Fowle, and myself, held an inquiry. Inspector Fowle was present; and now in his evidence he says he immediately examined the work. If he immediately examined the work, it would be on the next day I presume; and why did he allow six or seven of us to hold an inquiry when he had the information up his sleeve that the work was all right. I should like to know why he kept it up his sleeve for two years and a half, in the meantime allowing men to be charged with something of which he says they are not guilty, and ultimately getting one of them temporarily suspended on a far more frivolous charge about a week or a fortnight afterwards.

16733. The inquiry you say was held a week after your report? About a week, I think; but I do not know the exact date.

16734. Were you present at the inquiry? Yes.

16735. What did Fowle say;—did he say anything? He never said anything.

16736. Did he say anything about his inspection? No. In addition to that, I may mention that Inspector Fowle must have sent in six daily reports between the date of my report of 31st January and the date of Mr. Davis' coming over to hold the inquiry. I challenge him to show that in any of those daily reports he said that I refused to go down the shaft and that he examined the work and found that it was all right.

16737. Inspector Fowle has given evidence that you were taken off the job when there were only about 30 yards of brickwork to be done, and that the work was in close proximity to its close;—is that so? I think the plan would show that when I was taken off the job numbers five and six shafts were working, and that the extension at Ernest-street was just ready to commence. It commenced a few weeks afterwards.

16738. Who took your place? Inspector Eyre.

16739. You mean the man who was called Dick Eyre? Yes.

16740. How long was he on the job after you left it? Between three and four months, I believe.

16741. Are you sure of that? I am only going by my meeting him when I was coming over in the boat. I could not swear that he was there.

16742. Can you tell us the exact date upon which you left the job? I believe it was on the 22nd February, 1894.

16743. Is there any further statement you would like to make in answer to the evidence of Inspector Fowle which you have seen published? No; I have no further statement to make. The only explanation is that Inspector Fowle may have mixed up the three reports—first, as to the dry stone going down the shaft; secondly, as to the broken brick; and, thirdly, as to the dirty metal. He may have mixed up



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- those reports in some way, but I can say this, that he never asked me directly or indirectly to go down the shaft.
16744. *Mr. Davis.*] You say that Connors, the bricklayer, asked you to go down the shaft and examine the work in order, I presume, that you might be satisfied as to whether the work was bad or good? I could not say what his reason was. I believe his reason was that he did not think I would go down.
16745. In any case you did not? No.
16746. So that you are not in a position to say whether the work was bad or good? I am in a position to say that it was bad.
16747. You could see a matter of 100 feet below the surface, and could tell precisely whether the work was good or bad? I could tell the difference between concrete and dry material going down a shaft, and you have altered considerably if, when you knew that I had allowed dry material to go down, you would not either have suspended me or taken half-a-crown off my wages.
16748. Do you say that you were discharged from Contract 79 on 22nd February, 1894? I cannot say I was discharged; I was removed.
16749. Did you tell Mr. Parkes you were discharged? I did not.

Joseph Husband sworn and examined:—

- J. Husband.  
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16750. *Mr. Davis.*] You are an inspector in the Sewerage Branch? Yes.
16751. For how many years have you been an inspector in that branch of the service? Sixteen years.
16752. Had you anything to do with Contract 69? Yes.
16753. You were an inspector there? Yes.
16754. What did you look after? The tunnelling and the ironwork.
16755. That is to say the excavation of the tunnel and the laying of the syphon-pipes and the flushing-pipes in the Illawarra Road? Yes.
16756. Do you remember anything that occurred in connection with the scour-pipe? I do.
16757. I believe you have written a report about what did occur? Yes.
16758. You also have a sketch made? Yes.
16759. I believe you made the following report about 8th June, 1896:—

I HAVE the honor to call your attention to a statement made by a pipe-layer named "Benson," who gave evidence before a Royal Commission last week, in which he affirms a joint was made by him, where there was only about 1-inch hold in the thimble; and, seeing that the work in question was carried out under my supervision, I hereby beg to give this statement a direct denial, the circumstances of the case being as follows: The opening or space between the ends of the two pipes was 17 feet. To fill this up two lengths of pipe were obtained, one length being 10 feet long, and the other was cut to 7 feet long, but in cutting this pipe no allowance was made for the sockets, which consequently shortened the pipe 10 inches; and as the thimble is 15 inches long this allowed 2½ inches joint in the thimble at each end. Had this been an ordinary case of pipe-laying I could not have allowed this to pass, but seeing the pipe and joint had to be and was encased in a solid mass of concrete, as shown at A on annexed Plan in red, the said concrete being specially made for this purpose, and which was put in position under my direct supervision, I never leaving the work until it was completed. A statement is also made about some bolts, to the effect that the bolts were smaller than what was specified. The facts of the case are thus: the holes in flanges were 1½ inch diameter, and the bolts used were 1 inch diameter, as shown on Plan, and marked B in red, the bolts screwed up tight, after which a collar of lead was run round the whole of the joint encasing the bolts, as shown and explained by note on drawing, the whole length of pipe being embedded in concrete, as shown on Plan.

That is a correct explanation of what took place in connection with the scour-pipe at Illawarra Road? Yes.

16760-1. You consider that although the pipe was a little short and the bolts were a little small at the flange joints a good job was made? Yes.

16762. *Mr. Gummow.*] Did the contractors do this without your knowledge—did they scamp this work? I do not think the contractors knew anything about it. I did not speak to them about it.

16763. Was it under your supervision that the whole thing was done—was it done with your full knowledge? Yes.

16764. *Mr. Parkes.*] Do you recollect the date when you first went on to Contract 69? No.

16765. Did you go on to the contract from the commencement of the job? I was on and off it two or three times from the commencement.

16766. Did you not keep a diary? Yes.

16767. Have you it with you? No.

16768. Would your diary contain the dates upon which you went on and off the contract? Yes.

16769. What else would your diary contain? Nothing except particulars as to the driving.

16770. You were only inspecting the driving? Yes, and the ironwork I have already spoken of.

16771. Did you come off when the driving was finished? Yes; after I had finished the ironwork.

16772. How long were you on that? I could not tell you the dates unless I referred to my diary.

16773. Did you take any measurements of the driving? Yes.

16774. How did you measure it? With a tape.

16775. How was it done? From chain to chain.

16776. But in what manner did you measure the section of the tunnel? I did not take any sections. The engineer took the sections.

16777. Did you never take any section at all? No.

16778. What did you measure the length for? To see what we were driving per week.

16779. What was the material you drove through? Different kinds of material—rock and shale.

16780. Was there much shale? I could not tell you.

16781. It was a pretty wet drive? Yes; parts were very wet.

16782. That would denote that it was shale? In some parts the shale was wet.

16783. Did you go through any sandstone rock? Yes.

16784. How much? I could not tell you.

16785. Did you not take the measurement of it? Yes; but I did not keep the lengths myself.

16786. And you could not say from memory? No.

16787. Does not Contract 69 run into the triplicate pipe sewer that goes over Rockdale between Arncliffe and Cook's River? Yes.

16788. Have you ever noticed what a quantity of soakage water there is running down those triplicate pipes? No; I have not.



16789. How could that water get into the sewer of Contract 69; where does the water come from which is running down it at the present time? From the dead end I suppose, where the tunnel is finished up to the rock. J. Husband.  
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16790. Is that the only place where it comes out? That is the only place I know of. I do not know much about the work.
16791. You have not seen the work since you left? No.
16792. Did you see any concrete work going on on the job? Yes.
16793. Did you send in any returns affecting the concrete? No; I was not in charge of that.
16794. How many cement sheds were there on the job? I could not tell you.
16795. Did you ever see them? I have passed them, but I could not tell you how many there were, or what they had in them.
16796. Do you know the situation of them? One of them was at the Illawarra Road—in the yard at the back of the "Empress of India Hotel."
16797. Were all the sheds in that yard? I do not know.
16798. Were they distributed over the work? They had different sheds, but I did not take particular notice of them.
16799. But surely an inspector on one of these works ought to know everything about them? I was not looking after that part of the work.
16800. But you could not walk over the work every day without knowing where the cement sheds were? I do not know anything about the sheds or cement.
16801. Have you been constantly in the Department for sixteen years? Yes.
16802. Without any intermission? Yes; I was in the Roads and Bridges branch at one time. I was on the Parramatta Bridge, and from there I came to the Sewerage branch.
16803. Is there any time during the sixteen years you have named when you were not engaged by the Government? No; I have been constantly engaged by them.
16804. *His Honor.*] As to the pipe-work to which you have referred—did you refer the matter to the engineer, or did you act entirely upon your own judgment? I spoke to the engineer about it, and he was quite satisfied.
16805. Who was he? Mr. Gibbs.
16806. He did not refer it any further, I suppose? No.
16807. He was satisfied at once and told you to go on with the work? Yes.

Arthur Edward Cutler sworn and examined:—

16808. *Mr. Davis.*] What is your position in the Department? I am Chief Draftsman in the Sewerage Construction Branch. A. E. Cutler.  
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16809. You know the aqueducts which are being erected at Johnstone's and White's Creek on Contract 77? Yes.
16810. You have made some calculations as to the stability of the arches, the carrier, and the piers, under varying circumstances? Yes.
16811. Speaking generally, would you say upon the stress-sheet that you have prepared that the structure is a stable one? Perfectly stable under all circumstances.
16812. When the channel is running full what would be the average pressure on the crown of the 75 feet arches? 320 lb. to the square inch.
16813. What would be the average pressure at the springing? 304 lb. to the square inch.
16814. And the maximum at the springing? 491 lb.
16815. What would you say is the ultimate compression that compo., composed of 3 to 1 mortar, will stand? 2,000 lb.
16816. That is what is usually reckoned in all engineering works? Yes.
16817. So that the factor of safety in the arch, without taking the grill into consideration at all, would be how much? About 5.
16818. Taking into consideration the grill, it would be much more than that? It undoubtedly would be very much more than that.
16819. You have also calculated the strength of the side of the carrier? Yes.
16820. What would it be, running three-quarters full;—will you show His Honor the stress-sheet you have prepared? Yes.
16821. You have made a calculation as to the carrier with or without the iron work? Yes.
16822. Without the ironwork would the carrier collapse? No.
16823. Not even if the iron mesh were taken completely away? It might crack from expansion and contraction arising from variations of temperature.
16824. What would be the factor of safety without the mesh? Three.
16825. What would be the factor of safety with the iron mesh? It would vary from 10 to 15. It is not proportionately strong throughout. In accordance with the changes in the strains it would vary from 10 to 15.
16826. Taking the strains under the most adverse circumstances—that is, with a hurricane blowing, and with the channel three-quarters full, there would be a factor of safety in the channel varying from 10 to 15? Yes.
16827. The grillage, therefore, would have what effect? It would make the structure from three to five times as strong as it would otherwise be.
16828. In drawing this stress sheet what wind pressure did you take into account? 56 lb.
16829. What is that equal to? A hurricane at the rate of 150 miles an hour. That is excessive, of course, but it was taken so that we might be absolutely on the safe side. There is very seldom such a pressure as that.
16830. But that is what you took to arrive at the results you have given? Yes.
16831. A fair thing would be about how much? From 30 to 35 lb., equal to a hurricane of from 80 to 90 miles an hour.
16832. With 30 lb. pressure, or a hurricane of 80 miles an hour, what would be the factor of safety? It would be 4.
- 16833.

- A. E. Cutler. 16833. You have recently, from a professional point of view—that is, for the information of the profession—collected a number of facts in regard to the strength of the Monier structure in relation to other structures of a similar kind;—I believe you put this information in the form of a paper which you read before the Engineering Association? Yes. [*Vide Appendix No. 59.*]
- 11 Sept., 1896. 11834. Will you give us the comparative results obtained from the tests which have already been referred to in the evidence, taking brick, concrete, and Monier, structures? The several descriptions of arch were tested under exactly similar conditions. One was composed of brick, one of concrete, one of limestone, and one of Monier work.
16835. *His Honor.*] You are alluding now to the experiments made in Austria? Yes.
16836. *Mr. Davis.*] What was the span of the arch? Seventy-four ft. 6 in.
16837. So that it would be a similar span to that of the Monier arch in this particular contract? Yes.
16838. What was the strength of the Monier arch in relation to the brick arch? It proved to be five times as strong as the brick arch before it collapsed—that is to say, the load it carried was five times as heavy per unit of area as the load carried by the brick arch.
16839. What was the strength of the Monier arch in relation to the stone arch? It was four times as strong.
16840. And what in relation to the concrete arch? It was three times as strong.
16841. How long have you been in the Sewerage Branch? About six years.
16842. Before that where were you? Immediately before that I was working for the Treasury, and before that again I was working for M'Creddie Bros.
16843. Did you do any work for them in Queensland? Yes, a lot of work.
16844. Did you do any sewerage work there? Yes; I got out designs for the Tumbool divisional Board sewerage.
- 16845-6. There were two sewers in that scheme? Yes.
16847. Can you remember the designation of the sewers? Gaythorn-street was one and Cooksley-street was the other.
16848. Do you remember the length of the sewers? Not absolutely.
16849. Could you give us a rough idea of it? I am almost certain that neither of them could have been more than a mile long.
16850. In the aggregate then, the work would not be over 2 miles in length? No, I do not think it could have been over 2 miles.
16851. Do you remember the depth of the sewer? It was all shallow ground. I could not say the maximum depth. It was laid seven or eight years ago. I should not think, however, that the maximum depth would exceed from 20 to 25 feet. The average depth, I should say, would be from 8 to 11 feet.
16852. Could you say whether there was any tunnelling in the contract or not? I could not say absolutely; but to the best of my knowledge, there was no tunnel work.
16853. So that if a witness, Mr. M'Creddie, has said, speaking of this particular work, that in one case the length of the sewer was from 3 to 4 miles, and in the other case from 7 to 8 miles, that would be rather stretching it? If that were so, and if this were the particular sewerage work to which he referred.
16854. What was the packing or filling which was used over the sewer, do you know? I cannot say positively.
16855. But to the best of your recollection there was no tunnel-work? No.
16856. Would you say that there was any parallel whatever between that work in Queensland and the work carried out by the Sewerage Department of New South Wales, at North Sydney, with which you are acquainted;—I mean the work in Contracts 79 and 79A? Not the slightest. The sewer carried out for the Tumbool Divisional Board was similar to the ordinary barrel stormwater sewers which we carry out in Sydney.
16857. *Mr. Gummow.*] In connection with the stress-sheet you have produced, you say that the maximum strength per square inch is 491 lbs.? Yes.
16858. How did you arrive at that? Through a deviation which is shown in the stress diagram.
16859. What theory did you use? Schieffler's.
16860. Did you make out any calculations by the theory of elastic arches? A similar arch to those of the 75-foot span with a dead load coming vertically onto the arch ring was tested by the elastic theory, and the line of pressure very closely coincided with the line of pressure as I arrived at it by Dr. Schieffler's theory.
16861. In arriving at the 491 lbs. to the square inch did you use a wind pressure of 66 lbs.? No.
16862. What wind pressure did you use? The result I have given you is due to dead load, without wind pressure.
16863. *His Honor.*] Did you apply the wind pressure to the carrier only? No, to the arch as well. The wind pressure would affect that point, but it would not affect it wholly at that point, but right throughout the arch ring. Through the whole depth of the arch ring it would produce a bending moment, tending to bend the carrier and arch in a horizontal direction.
16864. *Mr. Davis.*] Regarding the arch and carrier as a girder? Not only as a girder, but as a continuous girder.
16865. *Mr. Gummow.*] Did you take this as dead load all over the arch, not allowing for any strength in the carrier itself? I took the load as coming on the arch at the points of support.
16866. You took the carrier and loaded your carrier as a dead load on the arch? Yes.
16867. You did not allow any strength for the material in the carrier itself? No; I took the load coming on to the arch ring at the piers that support the carrier.
16868. *His Honor.*] Without treating the carrier as a girder? Yes.
16869. In which relation, in point of fact, it has a very appreciable action? Yes; it strengthens the work without doubt.
16870. Where were these experiments made in Austria to which you have referred? At Puckersdorf.
16871. *Mr. Parkes.*] That is what is given in the books, is it not? The extract upon which these results are based was taken from the *Engineer*. I worked out the strains myself.
16872. Are these your own calculations? Yes.
16873. When did you make them? Four months ago.
16874. That is when you started to make them? The calculations as to the experimental arches were only finished three weeks ago.

A. E. Cutler.  
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16875. As to Mr. M'Credie's matter, you were an employee of his in Brisbane? Yes.
16876. Have you plans and measurements to prove the correctness of the information you have given as to the work which M'Credie Brothers carried out in Queensland? I have neither plans nor measurements. As I stated to Mr. Davis, I have spoken absolutely from memory.
16877. How long were you with M'Credie Brothers? I suppose about twelve months.
16878. Was the work to which you refer completed in that time? It was started, but it was not completed.
16879. How do you know that they did not go on with a further section? I told Mr. Davis that the sewerage work, which I knew to be carried out, was of the dimensions I gave.
16880. But what is the use of your giving these lengths if you do not know if they were the final lengths or not? I am referring now to the sewerage works carried out for the Tumbool Divisional Board, and those works finished up at the river. It is quite possible, however, that Mr. M'Credie may not have referred to that particular work.
16881. But may they not have continued the particular sewer of which you were speaking? It finished off at the river, and they could not have taken it further in that direction.
16882. Might there not have been branches? The sewer was to drain a flat. I cannot see how it could go any further than it did. To the best of my knowledge I have given you the right lengths.
16883. But you have no plans or measurements? No; if I had I could give you the lengths absolutely.
16884. You made that survey and prepared the plans? Yes, and I saw the work in progress.
16885. But it was not completed when you left? No.
16886. As to the test to which you have referred, I understand you to say that they are tests of your own made upon the basis of certain experimental arches? The calculations made by me were, as I pointed out, on the arches referred to in the extract from the *Engineer*.
16887. Do you remember Mr. Baltzer being in the office? Yes.
16888. Did you know that he was one of the holders of the Monier patent? No.
16889. Not at that time? No. I knew that Mr. Baltzer was connected with the Monier system, but in what respect I did not know.
16890. Was most of his energy and time devoted to planning the Monier system in the office? He did not devote any of his energies in the office to planning the Monier system.
16891. But there was some planning of the Monier system in the office;—there were some tests, were there not? No; the only test carried out by the Works Department was the test of the plate of which I think you have already been informed.
16892. Were not some Monier plates tested over at Gladesville? I believe the Roads and Bridges Department put down something of that description, but whether it was Monier work or not I do not know.
16893. Did Mr. Baltzer press the Monier work very much when he was in the office? No; I remember that in one case—I think contract 112—we got out alternative designs, one being Monier work, and the others ordinary concrete.
16894. Why did you make a distinction between the concrete and Monier work? Because they are distinctly different.
16895. What is the distinction? The concrete is purely concrete, and has no iron mesh in it at all. The consequence is that the whole structure, including the carrier, would be designed in such a way that a very slight, if any, tensile strain would be allowed for; whereas, when the iron mesh is in the carrier and other portions of the structure it can be calculated to stand considerable tensile strength without any fear of damage.
16896. When you designed 101 or 112 did you take out the quantities? No; personally, I had nothing to do with the quantities.
16897. Who took out the quantities? The quantities of 112 were taken out by Mr. Adams and Mr. Brammer. Mr. Evans may have assisted them, but I am not sure.
16898. Who took out the quantities of 77? I think the majority of those were taken out by Mr. Brammer.
16899. Who else? He may possibly have been helped by Mr. Evans; but I am of opinion that they were not checked. I think Mr. Adams was away on leave at the time. I am speaking absolutely from memory.
16900. Do you know who attached the prices in the case of 112? Mr. Bagge.
16901. In every case? Yes.
16902. He always put the prices to the quantities? Yes; he always priced up all the quantities.
16903. Would those prices have been seen by any officers of the Department? Only those directly concerned in designing the work would be likely to see them until tenders were called for—in fact Mr. Bagge was very careful with that kind of thing.
16904. Can you recollect when the schedule of No. 77 was made out? It would be hard to say, because No. 77 has been in hand, more or less, ever since I have been in the Department. There have been two or three changes in the design and quantities. It has been chopped and changed about, and the schedule itself has been altered several times, so that it would be very hard to answer your question definitely. The schedule was prepared three or four years ago, but it has been changed considerably.
16905. You recollect Carson's and Ahearn's contracts 64 and 101? Yes.
16906. The first plan and schedule for No. 77 were prepared at about the time those contracts were prepared? I think, in all probability, the first plan was, but I could not speak as to the schedule. I was not upon that work. Mr. Bagge did not let anyone see what he did in these matters. The first plan was prepared before the plans of 64 or 101, but it was superseded as being too extravagant.
16907. Then a reduced plan was made? Yes.
16908. At about what period? Considerably after 101 and 64 were let and carried out.
16909. In about 1895? Yes, about that.
16910. You see the plans of No. 64;—the carrier in that plan has double-pressed white brick and stone facing, with a concrete carrier? Yes.
16911. You notice the moulding in the stone? Yes.
16912. And the brick lining? Yes.
16913. Is not that exactly similar to the carrier of No. 77? The structure is different.
16914. But as to the form of design, taking the moulding, for instance? The string course is similar.
16915. It is of similar material? Yes; it is of stone in both cases.

- A. E. Cutler. 16916. The moulding of the string course and the depth is the same, is it not? The string courses are very similar, it is the same class of work.
- 11 Sept., 1896. 16917. The brick facing is the same, double pressed bricks are used in both cases? Yes, it is practically the same as far as that goes. Of course the two designs, as a whole, are distinctly different. The bricks and the stone are the same.
16918. As far as a carrier is concerned the designs are similar? There is the same class of carrier in both designs.
16919. But taking moulding for moulding they are almost the same? That is true; the mouldings are almost the same.
16920. Is not the brickwork the same? Yes, as far as the carrier is concerned they are practically the same work.
16921. And the string course that runs along the crown of the arch is of stone? Yes.
16922. In the case of No. 77, there is an elliptical arch shown instead of a segmental arch? Yes, in 77 the main arches are elliptical.
16923. They are a more costly arch to build than the segmental arches? Under certain circumstances, yes. I do not think the cost would be very much greater. I cannot see where much difference should come in between the cost of a segmental and elliptical arch.
16924. But do you not know from your experience as a practical man that there is a difference? It would depend wholly upon other features in the design. There ought not to be very much difference.
16925. Not as regards the striking of an elliptical arch? The carpenter's work in the striking of the arch is a small item in the total cost of constructing the work.
16926. Is there not more labour in an elliptical than in an segmental arch? There is perhaps a little more labour in striking the arch, but compared with the total cost of the job that does not amount to much. There would not be very much difference in cost. I doubt whether it would make any appreciable difference.
16927. But is not an elliptical arch more costly to build so far as material is concerned? If it be a small arch, yes; because you would want in all probability moulded bricks. In a large elliptical arch there would not be very much difference, because the bricks would remain ordinary bricks.
16928. Are the bricks in the elliptical arch not specified to be radiated in this case? As far as I know I think not. I did not design the work.
16929. *His Honor.*] Is it usual to use radiated bricks in arches of that size or not? No.
16930. *Mr. Davis.*] Mr. Parkes asked you when you prepared this stress sheet which you have put in, was it not a fact that a stress sheet similar to this, although not quite the same, was prepared before the Monier structure was accepted for Contract 77? Yes.
16931. And that stress sheet shows that the 75-foot arch under more unfavourable circumstances was perfectly secure and stable? Yes.
16932. *Mr. Parkes.*] When was that first calculation made? It was made at the time that the designs for Contract 112 were prepared.
16933. None were made after that? None after 112. It was for a 75-foot span, the same as in this case.
16934. *His Honor.*] Who made the calculation? Mr. Baltzer and Mr. Kern. I made one also for different sized arches at the same time.
16935. *Mr. Davis.*] To see which would be the most economical to adopt? Yes; all the calculations were got out to see which would be the most economical kind of arch.
16936. *His Honor.*] Were these calculations made, then, for the purpose of working out Mr. Bagge's report—I mean the report in which he compared two forms of concrete arch with the Monier arch? They were all made out for that particular contract.
16937. None of them were made out, then, for the Monier system, as applied directly? Yes, one was made out absolutely upon the Monier system.
16938. That was one of Mr. Bagge's schemes, but afterwards, when the tenders for Contract 77 were sent in, with an additional lump sum tender, involving the present Monier arch plan, no plans were made out for that of itself in any way? No; it was recognised that the arches were very similar; and, as the 77 strains would be lighter than those we calculated for 112, as far as I can remember, the thickness of the arch ring being increased from 10 inches to 12 inches, we thought there could be no question about the stability of 77.
16939. No. 77 appears conclusively to be stronger than the Monier plan that was worked out for Mr. Bagge's scheme? The dead load is much lighter in the case of 77 than it would have been in 112.
16940. And the arch also is in fact stronger? The arch ring, as originally designed in the office, was 10 inches at the crown. In the case of 77 it is 12 inches.
16941. The same thing applies to the springing? Yes.
16942. So that there is a little more stability in the arch and less weight to be borne? Yes.
16943. *Mr. Gummow.*] In making up these different plans for this report of Mr. Bagge you had nothing to do with the Monier system? No.
16944. You were instructed to make up a design upon another system in friendly antagonism to the Monier system? That was so.
16945. There was a certain amount of rivalry in the matter? There was a certain amount of rivalry between the two systems at the time.
16946. You were actually working on a system opposed to the Monier system? I was working against the Monier system.
16947. *His Honor.*] I do not exactly understand that? It occurred in this way: Mr. Baltzer had a certain design given to him by Mr. Bagge to carry out on the Monier system for Contract 112, and I had another design to get out which was not upon the Monier system, and I was naturally anxious that my design should, if possible, be carried out.
16948. Your design was No. 2? Mine were No. 1 and No. 2.
16949. Who worked out No. 3? Mr. Baltzer, with the aid of Mr. Kern and Brammer.
16950. By direction of Mr. Bagge? Yes.
16951. Do you know anything about the working out of the present No. 77—the lump sum plans;—do you know who worked them out, and at what time they were done? From what I know outside the Department, and from seeing Mr. Baltzer bring them to the office, on one occasion, to show them to me, I should say that Mr. Baltzer worked them out.
- 16952.

16952. Can you say whether he worked them out to any extent in the office? Not to any extent in the office. I only saw them once, and I fancy that when I saw them they were practically finished. A. E. Cutler.  
 16953. As far as you know, where were they worked out? As far as I know they were worked out by Mr. Baltzer at his residence. 11 Sept., 1896.
16954. As far as you know, they were probably founded in fact upon the other plans? They may have been founded upon them. In engineering, if you make one design it is only natural that the same design should run into two or three others of the same nature.
16955. As to Contract 77—I mean the original design—you say that it had been originally worked out very elaborately? Yes. It was somewhat similar to the design before you, but much more elaborate. There was considerably more freestone in the arch.
16956. How came the elaboration to be reduced? I have no official information on the subject, but I fancy that it was pointed out that 64 and one or two of those contracts were too elaborate; and 77 was originally designed before 64. That having been pointed out, it was thought necessary to reduce 77.
16957. 77 was reduced while 101 was actually going on—is that so? Yes; 101 would be in course of construction when 77 was reduced.
16958. But when the plans of 112 were in the office? I think 112 had just left when the alterations were made to 77.
16959. 77 being still kept as rather an ornamental plan;—you would call 77, as it appears before us, an ornamental plan decidedly? Yes; but for a Government work of that description I could not call it extravagant.
16960. It is much more so than 101? 101 was originally intended to be covered in with an embankment.
16961. It was not intended for beauty on its own account? No.
16962. It was intended to be covered? Yes.
16963. 77 was intended to stand out, to show itself? Yes.
16964. For a Government work of that kind, you think it was reasonably ornamental? Yes.
16965. Just fairly good-looking? Yes.
16966. *Mr. Davis.*] You were working in the same room as Mr. Baltzer during the whole time these designs were being prepared for 77? Yes.
16967. And at the time the tenders for 77 were received? Yes.
16968. So that you would have had every opportunity of seeing whether Mr. Baltzer prepared the design for the substituted plan in the office? Yes. We were in the same room the whole time.

Varney Parkes recalled and further examined:—

16969. *Mr. Smith.*] With regard to your substituted charges of 4th September, I understand that with regard to those in which Mr. Hickson, junior, is involved—the undue concessions alleged to have been given to this firm of contractors—they are now limited to three? Yes. V. Parkes.  
 11 Sept., 1896.
16970. One of those relates to the obtaining of Contract 79, and the other to the obtaining of Contract 77. Those were two of the old charges? Yes.
16971. And in addition to that we have one in regard to undue concessions alleged with regard to the Monier patent? Yes.
16972. As to that charge with regard to the Monier it refers to an improper minute—inaccurately stating the cost of a special test;—I should like you to tell the Commission what that minute was? I have placed certain evidence before the Commission, and it is not for me to be the judge of the strength or conclusiveness of that evidence.
16973. *His Honor.*] Mr. Smith has asked you a specific question with regard to a particular minute, and I think the question is a fair one? I will answer it by saying, all the correspondence or papers referred to in the Parliamentary return or which have been found during the Commission. I cannot be made the judge in my own case.
16974. I think the question is a fair one, because there is a specific minute mentioned in the charge, and you are asked to identify that particular minute. It is not a question of the strength of the evidence you have tendered? While identifying that minute, I would say that there is other correspondence in connection with it which I have adduced as evidence. I should like to alter that charge, and make the wording “improper minutes” instead of “improper minute,” because there are more than one relating to the matter.
16975. *Mr. Smith.*] Then I will ask you what were the minutes? The minutes are those disclosed in the papers concerning the Strathfield culvert, and the minutes disclosed in the papers referring to the letting of Contract 77.
16976. Does that include the minute of Mr. Hickson of 18th July, 1894, and which is referred to upon page 33 of the evidence—question 1260? Yes; it includes that and other minutes.
16977. Do you know of any minute with reference to a 15 per cent. royalty being allowed to these contractors? I know of none but these minutes of the Minister approving, and the evidence disclosed in the papers connected with it.
16978. You mentioned some minutes relating to Contract 77;—is there one word in any one of those minutes referring to the 15 per cent. royalty which you mentioned in your charge? There may not be.
16979. Do you know of any minute which has any reference to the 15 per cent. royalty? Possibly not, but I might adduce evidence during the course of the Commission tending in that direction.
16980. As regards Contract 77, Charge No. 1, you have made a slight alteration;—it refers to Carter, Gummow, & Co. submitting a plan of their own upon a patent held by them, and you have added the words “and an officer of the Department”;—did you ever hear of any other officer under the Government holding a patent? I did not. If I had heard of it you would probably have heard of it.
16981. In your statement the other day you referred to the Votes and Proceedings of the South Australian Parliament for the year 1879–80, from which you said that you had come to the conclusion that Mr. Hickson’s works had come to grief in South Australia;—you said that in consequence of something that Webster told you you looked up the reports? Yes.
16982. I think you referred to a Commission before which you said Mr. Hickson gave evidence? Yes.
16983. The volumes of the proceedings for 1879–80 are here, and I would ask you to be good enough to tell His Honor to what you refer? To the proceedings of the Royal Commission sitting upon Wells Brothers’ contracts for the Rivoli Bay and Kingston jetties. 16984.

- V. Parkes.  
11 Sept., 1896.
16984. You know that there was an arbitration with reference to those jetties, and that the contractors made some large claims against the Government? Yes.
16985. The award being in favour of the Government? Yes, as it certainly ought to have been.
16986. The award was to the effect that the contractors had no claim? As it ought to have been.
16987. You agreed with the award? Yes, certainly.
16988. Do you not, after all, mean the arbitration proceedings before which Mr. Hickson was examined? That is one case, but there are a series of cases. From the arbitration which sat in Wells Brothers case—I proceed to where there had to be alterations and rearrangements of the jetties. Ultimately the matter was discussed in connection with the Public Works Commission of 1880. That is all the knowledge I have of the matter at present. The facts are contained in the evidence given by Mr. Hickson himself, by Mr. Higinbotham, and by Wells Brothers and others concerned in the matter. Those are the particulars I read up some time ago.
16989. The evidence given by Mr. Hickson was given in the arbitration case? Yes.
16990. Mr. Hickson, as a matter of fact, was not examined before the Commission? No.
16991. So that when you stated that Mr. Hickson himself gave evidence before the Commission you must have been in error? I meant the arbitration in connection with Wells Brothers' contracts.
16992. The only evidence you referred to as having been given by Mr. Hickson is that given by him in connection with the arbitration on Wells Brothers' contracts? Yes. But I do not refer to his evidence alone.
16993. Are the speeches to which you have referred those which are reported in the South Australian *Hansard* for the Sessions of 1879–80? I was referring to Sir John Downer's address upon Mr. Hickson's conduct of business and to the speeches which are reported in *Hansard* for the Sessions of 1879–80. There are several speeches to which I referred, but I forget now whose they were.

MONDAY, 14 SEPTEMBER, 1896.

George Benson recalled and further examined:—

- G. Benson.  
14 Sept., 1896.
16994. *Mr. Parkes.*] I believe you wish to make a statement to His Honor? Yes; I desire to refer to the evidence of Inspector Husband. He said that a good job was made of the pipe work upon Contract 69, to which I referred in my evidence. I desire to contradict that statement.
16995. *His Honor.*] Husband said there was an overlap of  $2\frac{1}{2}$  inches on each side of the collar; he said also that the pipe was covered with concrete? I desire to contradict that statement as far as the  $2\frac{1}{2}$  inches is concerned. There was only three-fourths of an inch on each side. I myself did the job, and know exactly what there was.
16996. Husband also said that the pipe was bedded in concrete? Before I got out of the hole they had the concrete put on. That covered it all up, so that no one could see it.
16997. The difference between you and Husband is this: you still say that the overlap is only three-fourths of an inch on each side instead of being anything more? Yes. The collar is about 17 inches long, and there should be at least 6 inches of lap on each side to make a perfect joint. There should be only about half an inch between the two pipes. Instead of that there is about  $15\frac{1}{2}$  inches of space between them.
16998. Are you certain that the overlap is not more than three-fourths of an inch on each side? Yes; or  $1\frac{1}{2}$  inch adding the two sides together. The job of the flange joint was also slummed. The bolts were short.
16999. You mean that the work was slummed by using short bolts? They slummed it by getting me to run it over with lead to stick it. As a matter of fact it would not stick it. What they were really depending upon was the concrete. I can give you another instance affecting the main sewer pipe, which is 3 ft. 9 in. in diameter. When they came to the Sydenham Road they could not open the whole road at once. They therefore laid their pipes half way across the road, and when that had been covered in they opened the other half. They found that they were 2 inches too high for an 18 inch gas main there, and in order to get over the difficulty of sending into the Gas Company and getting the gas main raised, at a cost of some £12 or £15, they carried the pipe down at a slant, leaving the joint open at the top and all round—in fact it was only home at the bottom. The same thing had to be done when they were coming up the grade at the other side, only in that case the joint was open at the bottom.
17000. Did you make the joint? Yes, I made a good job of it. There is no doubt about that. Unless the bed sinks at any time it may be all right, but if the bed sinks the joint will be very easily drawn.
17001. Were the bolts long enough to take the nuts properly? It is not a flange joint. It is only a lead joint. It is in the main sewer. They endeavoured to make out that the other job was merely a mistake. What I say is that if that is so they are all mistakes.
17002. Is the other pipe to which you refer bearing on the earth. Yes, on the earth.
17003. Did you fill both joints in the case to which you have just referred? Yes.
17004. And you made as good a job of it as you could? Yes. I have only mentioned the matter to show that the firm did their work any way. I was only six or seven weeks working for them.
17005. *Mr. Parkes.*] What do you say was the size of the gas pipe? 18 inches. I remember repairing it once for the Gas Company higher up the road.
17006. What is the size of the sewer that goes under it? 3 ft. 9 in. as nearly as I can guess. In order to lay the main sewer correctly they would have to alter the level of the gas pipe.
17007. To a considerable extent? To the extent of 2 or 3 inches at the very least, but I daresay it would cost just as much as raising the pipe a foot.
17008. *His Honor.*] It would not be possible to raise the pipe bodily without breaking the joints? No. I suppose it would take two or three days, and, of course, the Gas Company would have to be paid for it.
17009. *Mr. Gummow.*] As to the raising of the gas main, who would have to do it? I should say the Gas Company. They would not allow anyone else to interfere with their pipes. [*Vide Appendix No. 78.*]
17010. But who would pay for the work? Your firm, I suppose.
17011. Are you sure of that? Almost.
17012. Would not the Gas Company charge the Government? The Government had nothing to do with their mains.

17013. Are you sure that the Company would charge our firm? Almost sure, any way.
17014. Was this work to which you have referred done under Government inspection—this bending down of the sewer 2 inches? Yes.
17015. It was not the contractors' own doing behind the back of the Department? I suppose they all knew about it. Mr. Forrest was there, and he would probably know about it.
17016. But the Department knew of it? I do not know about that.
17017. Did an inspector see the work done? Yes; he told me to make as good a job of it as I could, and I did so. The other joint to which I have referred is a ridiculous job.
17018. *His Honor.*] Do you not think the concrete would make it as solid a job as necessary? That is what they are depending on, but I do not agree with that. That is not the way to get through work.

G. Benson.  
14 Sept., 1896.

Robert Rowan Purdon Hickson recalled and further examined:—

17019. *Mr. Smith.*] For some time you were Engineer of Harbours and Jetties in Adelaide? Yes.
17020. Your appointment was made through the Agent-General, in London, on behalf of the Government of South Australia? Yes; by the late Mr. Dutton.
17021. When were you appointed;—I believe you have a letter from the Agent-General which will fix the date? Yes; I have the following letter, dated 5th March, 1876, from the Agent-General, in London, for South Australia, introducing me to the then Colonial Secretary of South Australia, the Hon. G. C. Hawker. The letter is as follows:—

R. R. P.  
Hickson.  
14 Sept., 1896.

I HAVE the honour to introduce to you Mr. Robert Hickson, C.E., Member of the Institute of Civil Engineers of Great Britain, the gentleman who I have already informed you, in preceding despatches, has been selected by me, in conformity with the authority given by you to me, to fill the important appointment of Engineer of Harbours and Jetties, at a salary of £950 per annum, as provided on the Estimates.

Mr. Hickson proceeds to the Colony with his family by the present mail steamer, his salary on full pay commencing on the day of embarkation, the 9th March.

I have paid to Mr. Hickson the agreed sum of £200 towards the cost of the passage money of himself and his family, which I have charged to the Parliamentary Vote undrawn preceding the 9th March.

In recommending Mr. Hickson to your very favourable reception, it affords me great pleasure to add my entire conviction that a more satisfactory selection for the important office Mr. Hickson is to fill could not possibly be wished for.

17022. You left by the mail indicated by the letter, and you took up your duties on your arrival in the Colony? Yes.

17023. And you continued there as Engineer for Harbours and Jetties until when? Until June, 1880.

17024. Why did you leave the Service? My branch, among others, was done away with. At that time there were several branches in the Public Works Department, and they were all done away with, the whole of the work being put under the Engineer-in-Chief for Railways, who had been there for many years, and who was an old public servant.

17025. That was intimated to you by a letter from the Treasury? Yes; a letter dated 7th June, 1880, as follows:—

I HAVE the honor, by direction of the Treasurer, to inform you that, with the view of placing all public works, as far as possible, under one Ministerial head, the Government have decided that all works of construction connected with harbours and jetties shall be placed under the control of the Honorable the Commissioner of Public Works, with the exception of deepening operations, which will be continued under the control of the Treasurer, and will be carried out under the supervision of the Marine Board.

This decision will result in the abolition of the Department of Engineer of Harbours and Jetties from the end of the present financial year, which terminates on the 30th June instant.

I am, therefore, to intimate that no provision will be made for your Department on the Estimates for the ensuing financial year, and the Treasurer desires me to express his regret that your services will, consequently, not be required after the 30th instant.

17026. In the report of the Secretary for Public Works, which appears in Vol. III of the proceedings of the South Australian Parliament for the year 1880, this matter of the abolition of your branch is referred to? Yes.

17027. Appended to the report of the Secretary for Public Works, of October 25th, 1880, there is a report by Mr. Thomas Higinbotham, dated 24th September, 1879? Yes.

17028. Which is Appendix No. 2 of the report? Yes.

17029. He refers to the jetties at Rivoli Bay and Kingston? Yes.

17030. That was a contract taken up by Wells Bros., was it not? Yes.

17031. Tenders were called in London? Yes.

17032. The plans themselves were prepared by Wells Bros.? Yes.

17033. That was all done before you took office? Yes.

17034. When you came out here you found the work advanced to that extent? Yes; the plans were almost complete.

17035. You, as Engineer for Harbours and Jetties, signed those plans? Yes.

17036. For identification, as part of the contract? Yes.

17037. The contract was then entered upon and a dispute arose with the contractors? Yes.

17038. And it was referred to arbitration? Yes.

17039. The arbitrators found against the contractors and in favour of the Government? Yes.

17040. The only question in that arbitration, I believe, was with reference to the plans? Yes; as to whether the fact of signing them made them Government plans or not.

17041. I believe the award is dated July, 1878? Yes.

17042. During the course of the contract you had to condemn, or rather you refused to pass, a part of the work? I made an alteration in it, strengthening it.

17043. Part of it was not strong enough, and you had it altered? Yes.

17044. But you were not at all responsible for the want of the strength in the part you condemned? No; it was not my design at all. It was designed in London by a man I never saw until he came to South Australia.

17045. *His Honor.*] Was it a timber pile jetty? No; it was a screw pile jetty.

17046. *Mr. Smith.*] During your term of office a Royal Commission was appointed, I believe, in connection with public works? It appears to be so from the Parliamentary papers. I did not know anything about it at the time.



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17047. No report had issued while you were in the Colony? No; I was not called by the Commission to give evidence, and I did not know anything about it.

17048. You sent a wire to Adelaide to get all these papers? Yes.

17049. They sent you the report of Mr. Higinbotham, did they not? Yes.

17050. You have since ascertained that the report of the Commission issued on 13th October, 1880? Yes.

17051. It only deals with railways, and it appears in vol. 2 of the Proceedings of the South Australian Parliament for the year 1880? Yes.

17052. There has been no report of the Commission upon Harbours and Jetties as far as you can find out? No, I do not think so. I was not asked to appear as a witness.

17053. You were not examined by the Commission at all? No.

17054. But you were examined in the arbitration proceedings upon Wells Brothers' contract? Yes.

17055. And your evidence appears in the Blue Book containing the award? Yes.

17056. Is it true that any of your work in that Colony has, within your knowledge, come to grief? I do not know of a single instance. I have been in Adelaide very frequently since then, and I have travelled through the Colony.

17057. After you left Adelaide, I think, you were Consulting Engineer to the Melbourne Harbour Trust? Yes; I have been ever since I came to Australia.

17058. I think it was in September, 1891, that you received an appointment in this Colony? Yes.

17059. You had a telegram from Mr. Moriarty? Yes, I had a telegram from Mr. Moriarty offering me the position at Newcastle, and I accepted it.

17060. In 1888 you were appointed Acting Engineer-in-Chief for Harbours and Rivers? Yes.

17061. And on the retirement of Mr. Bennett you were appointed Engineer for Roads and Bridges and Sewerage? Commissioner for Roads and Engineer-in-Chief for Roads, Bridges, and Sewerage.

17062. In what year was that? June or July, 1889.

17063. *His Honor.*] After Mr. Bennett's death? No, before his death.

17064. *Mr. Smith.*] With regard to your son, he was employed in the Department previous to 1893? Yes. Perhaps I had better give His Honor the history of that matter from the beginning. My son served his time with Mr. Moriarty, and finished with Mr. Darley. He was one of the engineering assistants in the Sewerage Branch. In 1893 I was required by the Secretary for Public Works to reorganise the branch over which I presided. To give you some little idea of the importance of the branch I might mention a few facts in regard to it. It comprised about one-half of the whole staff of the Works Department, and the expenditure was about one-half of the whole expenditure of the Department. Out of a total of something like 5,000 contracts a year carried out by the Department, 4,000 passed through my hands, so that I had rather a large order when I was asked to reorganise the branch. However, I went through it carefully and submitted my report, which was approved by the Minister. My son's name was not included in that report as one of the retrenched officers. A few days after the report was sent in, I happened to be down in the Under Secretary's room—Mr. Barling was then Under Secretary—when he said, "I think it is only right to tell you of the report I have heard that while retrenching officers of old standing—married men—you have left out of the list of retrenched officers your son." I was rather surprised at that at the time, because I considered that I had done the duty entrusted to me fairly and honestly. I told Mr. Barling that what he said was quite correct, but I pointed out to him that my son was in a position in which he was doing fairly well, and that, as, if he left it, someone else would have to take his place, it never entered into my mind to retrench him. When I went home that night I thought over the thing again—I considered whether the fact of his being my son had influenced me in his favour. The result of my thinking it over that night, at all events, was that I made up my mind that I would recommend his retrenchment. So careful was I to prevent anything like home influence interfering with my determination in the matter, that I never mentioned it to a single person. I came into the office the next morning and wrote out a minute, recommending my son's retrenchment, and had it registered, so that it would be practically past withdrawal. I then sent word down to him and told him that I wanted to see him particularly. I explained all the circumstances of the case to him, and, like the loyal boy he has always been, he said "I will do as you like. I am young and strong and I can knock out a living for myself somehow. Am I to understand now that I can look out for employment where I like?" I said, "Certainly." I then went down to Mr. Lyne, the Minister, and he said the report had not come to him, but that if I had the least hesitation in my mind in regard to my son he would not allow it to go any further. I said I had made up my mind what I would do, and that I would adhere to my determination. The next morning my son came to me and said he had accepted an offer to go to Adelaide with Carter, Gummow, & Co. Mr. Carter happened to be in the office that morning, and I sent for him. I said "Is it true that you have a position for my son in Adelaide?" He said "Yes." I said "There is no mistake about it; you want someone?" He said his partner in Adelaide wanted an assistant, and that if he did not get this young man he would get someone else. He went on to state what he proposed to pay him. I stopped him at once, and I said "He is now your employee. You are offering to give him what he is worth, in your opinion, and it is nothing to me one way or the other." That is how the thing came about. A few days afterwards—I forget how soon—my son went to Adelaide. Those are the whole of the facts connected with his employment by Carter, Gummow, & Co. as far as I am aware of them.

17065. So that he was retrenched, not because of his want of capacity, but because you would not have it said that while other officers were retrenched he was kept on? That is the only reason. I might say that it was a severe blow to me, and that it was a very severe blow to him also, because he was getting on in the Department. He was, first of all, a staff officer, and that gave him a certain standing. He had a salary of £236 a year, and he had a camp and a cook, which really means that he had nothing to do but to clothe and feed himself. However, he left that position, and he went with Carter, Gummow, & Co., from whom he received £200. He had, out of that, to provide for himself and also to keep a horse at his own expense. I believe they afterwards increased his pay to £250 a year.

17066. It was the morning after your son had been retrenched that you saw Mr. Carter? Yes.

17067. You had not seen Mr. Carter before to have any conversation with him in connection with your son? I have had no conversation whatever with him. I do not think I have ever mentioned to either Mr. Carter or Mr. Gummow that I had a son in the Service. He never was on one of their contracts, and naturally the question never came up.

17068. The conversation which finally took place between yourself and Mr. Carter was just as you have described it? Yes.

17069. After that did you have any conversation with Mr. Carter as to your son? Yes; I said to him afterwards "I am sorry he is leaving the Service, but since he is leaving I am glad that he is with a respectable firm of contractors, as he will be able to learn a good deal with them. As he is now debarred from re-entering the New South Wales Service—because I would not on any consideration allow him to come back—perhaps he will have to take up contracting himself." Mr. Carter's reply to that was pretty short. He said "He is a great deal too young for that sort of work. In any case there is very little to be got out of contracting just at present."

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17070. That is all you remember as having passed between yourself and Mr. Carter? That is the whole thing as well as I can remember it.

17071. I will ask you to turn to Question 3406 in the evidence of Mr. Maddison. You will see that he gives an account of a conversation which took place between himself, Mr. Ewing, and Mr. Carter. He says "It amounted to this—that Mr. Hickson, junr., had been retrenched out of the Department, and that Mr. Hickson, senr., wished to find him employment of some sort, and had asked Mr. Carter if he could find anything for him to do or whether they would take him in as a member of the firm. The reply which I understand Mr. Carter made to that request was that Mr. Hickson, junr., could not be taken into the firm within five or six years." His Honor then asked, "That, I understand, was the account Mr. Carter gave you of what had happened," and Mr. Maddison replied in the affirmative. If Mr. Carter said anything of that kind would there be any truth in it? I did not see Mr. Carter in connection with my son until after he had been retrenched from the Service.

17072. So that whether Mr. Carter did or did not say what he is reported to have said the statement is absolutely untrue? Yes. Of course I do not know what may have taken place, or what Mr. Carter may have said.

17073. In the substituted charges you are charged with making undue concessions of three kinds by reason of your son being an interested party in this firm of contractors. The first charge is with reference to the Monier system. I will ask you to turn to Question 7436 in the evidence of Mr. Barling. You will see that reference is made there to a letter written by Mr. Carter on 2nd July, 1894, to this effect: "Referring to our conversation *re* the use of our patent system of bridge and culvert building, we hereby inform you that the royalty we require for the use of the same by your Department will be 15 per cent. on the cost of construction." Upon that you wrote your minute of 18th July, in which you said, "The Monier system of concrete arching has been patented in the Colony by Messrs. Carter & Co. Where applicable it reduces the cost of spanning an opening by about 50 per cent. The patentees are willing to allow the Department to use the patent on payment of a royalty of 15 per cent. on the cost of the arch. I recommend this for the Minister's approval. I might state I have just completed, with the permission of the patentees, a culvert on the Parramatta Road, built on this principle, with most satisfactory results, financially and otherwise." Do you remember writing that minute? Yes.

17074. Had you seen the contractors at all about the matter before they wrote that letter of 2nd July, or how did it come about that they said, "Referring to our conversation"? Mr. Carter mentioned the fact that he had taken out a patent for the Monier arches, which I knew had been patented on the continent. That is how it came about.

17075. Did you then discuss with the contractors the terms upon which they would be willing to allow the Government to use the patent? No; I do not think so. I think there was merely their offer without any discussion.

17076. They say in their letter, "Referring to our conversation"? I suppose that refers to the statement of the fact that they had taken out the patent. I do not know that they mentioned what percentage they would ask until the letter was written.

17077. It would appear from the letter that it was sent on to Mr. W. A. Smith, the engineer? Yes.

17078. So that the conversation therein referred to would probably be a conversation with Mr. Smith, but not with you? The conversation referred to would no doubt be with Mr. Smith. The only conversation they had with me related, as I say, to the statement of the fact that they had patented the thing.

17079. And upon that you wrote your minute of 18th July? Yes.

17080. In that minute you state that the patentees are willing to allow the Department to use the patent upon payment of a royalty of 15 per cent. on the cost of the arch? Yes.

17081. And you recommend that for the Minister's approval? Yes.

17082. At that time you had had a report from Mr. Smith as to the Parramatta Road culvert? Yes.

17083. At all events the work was far enough advanced to enable you to form a good opinion as to the nature and cost of it? Yes; and there was also my reading as to the Monier arch system generally.

17084. But you never induced the Minister to enter into an agreement to adopt this patent;—you never wrote any minute inducing the Minister to enter into an agreement with the firm? The minute you have quoted is the only minute I wrote, and there is nothing in that, because it was never acted upon.

17085. That was only obtaining the authority of the Minister to use the patent whenever it might be thought advisable to do so at a certain rate? Yes; in cases where it might be thought expedient.

17086. But there was no binding agreement between the Department and the contractors as to the adoption of the patent? No.

17087. The matter was still left entirely at large as to whether you would use the patent on any particular work or not? Yes.

17088. And, as a matter of fact, it had not been adopted upon any work, with the exception of the aqueduct on Contract No. 77 and the small culvert work on the Parramatta Road? Those would be the only two works.

17089. I think there was some work in which you had some idea of adopting it? Yes; I had it in my mind, at the time I wrote that minute, to design a Monier arch for the Kangaroo Valley bridge, the span between the cliffs being 230 feet. As it would have been the first bridge of the kind built in the Colony, I came to the conclusion that we would not do it, because, by getting out the plans ourselves, we should be throwing all the responsibility for the structure upon the Government. Although I was pretty well satisfied as to the suitability of the design for the work, I was not quite prepared to put the Government in that position, so we adopted another design of bridge altogether. In the case of the Johnstone's Creek and White's Creek aqueducts, I recommended the system, because we were putting the whole responsibility upon the patentees, and were leaving none with the Government.

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17090. The patent stood in the name of two of the contractors and Mr. Baltzer? Yes.
17091. With regard to the advisableness of allowing an officer in the Civil Service to be a patentee, has the question never been considered in the Department? Yes, frequently.
17092. I believe that, some years ago, on the motion of Mr. Bennett, the matter was referred to the Crown Solicitor? So I believe.
17093. With the result that a patent was issued? Yes; it was before my time.
17094. What is your own view in regard to the advisableness or otherwise of allowing a civil servant to become a patentee? I would not myself hold a patent against my employers, no matter who they were, but I never did and never would refuse the right to a subordinate officer who might, perhaps, be in receipt of a small salary. I would leave him to exercise his brains in patenting any article which he thought might be of advantage in the construction of any work with which he might be associated. As a matter of fact we have had two or three cases of men holding patents in the Department. For instance, the late Engineer for Bridges, who held a very responsible position, and who was a fairly high-salaried officer, held a patent for an expansion joint in connection with iron bridges, and the royalty in the case of that patent was £100 upon each bridge. He took out the patent before I came into the Department. Mr. Bennett and everyone knew about it. This officer received a royalty from the patent for several years, and afterwards sold his right to an outside firm. I am now referring to Mr. Macdonald. There is a young fellow in the office now who has taken out a patent for an opening bridge—a very neat construction it is too, I believe. As a matter of fact I believe we have no legal right to prohibit officers from taking out patents. I do not profess to give an opinion in the matter, but I think that on the grounds of expediency it would be most undesirable to prohibit young men from exercising their brains when they show any special qualification. I myself would never hold a patent against my employers, and I never have done it; but it might be said that I am in a different position, seeing that I have a larger salary and can afford for that reason, perhaps, to take a different view of these matters.
17095. In the old country it is not an unusual thing for officers of the Crown in various departments to hold patents; it is done in the army and navy for instance? Yes; men are continually taking out patents for arms and various things connected with warfare.
17096. The only minute you remember writing referring to a special test of the Monier system is that to which you have already referred, and the only special test you had in view is that on the Strathfield culvert? That was the only special test we had made.
17097. And the only minute you remember writing as to that is the minute dated 18th July in which you specially refer to it? That is the only minute I have written in connection with that.
17098. You do not quote the cost of it, but you say that it was attended with most satisfactory results financially and otherwise? Yes.
17099. The next undue concessions mentioned in the substituted charges relates to the obtaining of Contract 79;—will you refer to page 255 of the evidence. In this case Carter, Gummow, & Co. were the second lowest tenderers, Bond and Hudson being originally the lowest? Yes.
17100. On the page to which I have referred you you will see a memorandum by Mr. Christie; will you look at paragraph E—Mr. Christie there says, "One day prior to the date of the deposit being returned, viz., on 6th October, 1891, Mr. Hickson asked for the papers and wrote a minute recommending that fresh tenders be invited"—How does that minute of 6th October, 1891, read? "I recommend that fresh tenders be invited."
17101. It is not an unusual thing for the second lowest tender to be taken without calling for fresh tenders supposing the first tenderer drops out? No.
17102. It is a very common thing? Yes; the Board of Reference, with the exception of Mr. Barling, held rather strong views about it. We thought it hardly fair to invite fresh tenders for a work unless there were some alterations proposed to be made, because it placed the contractors at a disadvantage. I know that contractors themselves object to it very strongly. They say they have to go to the trouble of making out fresh tenders, and that their prices are known all over the place. They hold very strong views as to the inviting of fresh tenders. However, it has been done in some cases. There is no question about that.
17103. Then why, in this case, did you take the other course and recommend that fresh tenders be called? For two reasons—first, because there was a considerable time between the date at which the tenders came in and the date at which the minute was written; and, secondly, because there was a considerable difference between the lowest and the next tenderer—about £3,000, I think.
17104. That minute of yours of 6th October was submitted on 9th October? Apparently. Of course it would leave my hands, and in the ordinary way I should not know what became of it afterwards.
17105. It was not approved by the Minister, owing, I believe, to the want of money, until 22nd February, 1892? No; Mr. Lyne does not appear to have dealt with the matter until then.
17106. Then you wrote your minute of 22nd February, 1892? Yes.
17107. How does that read? "Since writing my minute of 6th October, 1891, complications have arisen with Carter & Co. *re* their Contract 72 having been stopped. They have made large claims on this account, some of which, no doubt, could not be entertained; but on some items they have made a good case. They are prepared, if they obtain this work, to waive all claims on No. 72. As their tender is a reasonable one, and some £3,000 below the estimate, I think it might fairly be accepted. If this course were adopted, work would be given at once to a large number of men."
17108. What were those claims in regard to Contract 72? They made a claim in connection with the stoppage of 72, amounting to something over £4,000.
17109. What was the nature of the claim; did you go into it? Yes.
17110. What was the conclusion you arrived at in regard to it? I thought they had a reasonable prospect of receiving about half of the amount if the case went to a jury.
17111. You formed that conclusion from a consideration of the facts of the case, and also from your experience of similar claims made against the Department? Yes.
17112. Is it not a fact that it is considered by the Department a risky thing to stop a contract like this;—that you render yourself open to damages? Yes, decidedly.
17113. There have been cases where claims of this kind have been substantiated? Yes, in one case, that of the Bondi sewer, the Department had to pay £3,000 for stopping the work for two and a half months. We had a similar case not long ago in connection with a punt which was to have been built for one of the rivers. It was decided afterwards not to build it, and the Minister was prepared to give a very large sum indeed

indeed for practically cancelling the contract. However we compromised the matter by letting the man build the punt for another place, and giving him an additional sum.

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17114. Was it before or after you wrote the minute to which you have referred that you saw Mr. Lyne? I saw him on the morning of the day on which I wrote that minute.

17115. What took place at the interview? I think Mr. E. M. Clark was there—but I am not quite sure about it—with the view of letting the work go on without calling for fresh tenders. I think he mentioned the fact that he understood a claim had been made in respect of another contract. Mr. Lyne asked me if I knew anything about it. I said that I did, and I went up and brought down the papers to him. We talked the matter over, and the conclusion to which I, and, I think, the Minister also, came was that it would be better to let Carter & Co. take up Contract 79 at their own tendered prices, especially as they were £3,600 below the office estimate, than to run the risk of having an action and submitting the case to a jury, seeing that in cases of that kind the verdict generally goes against the Government. I think myself that it was a very good bargain.

17116. You think it was a good settlement of that claim? Yes.

17117. And it was upon that that Mr. Lyne wrote his minute of the next day? Yes; he wrote his minute on the following day. It is as follows:—"As Mr. Hickson thinks Messrs. Carter & Co. could make good a claim for something like £2,000 as compensation on Contract 72 (Munni-street partly), should they be willing to forego this claim their tender may be accepted for the construction of the main outfall sewer, North Sydney, £38,890, as worked out at schedule rates. If this firm will not agree to the condition imposed, fresh tenders to be invited."

17118. That is a correct statement of what took place, as far as you remember. You thought the firm could make good a claim for something like £2,000? Yes, I had formed that opinion.

17119. Will you refer to Mr. Davis's memorandum No. 4, upon page 504 of the evidence. You will see that in his first paragraph he deals with the stoppage of work upon Contract 72. I suppose you confirm what he there states as to the facts? Yes; I think that is a fair statement of the case.

17120. In the first place, when this work was stopped, you wrote on 13th October, 1891, giving notice that you were stopping it under your powers under the contract? Yes.

17121. At the same time you had some doubt, I believe, as to how far the clause to which you referred would be a protection to you in the case of a claim? Yes, I had considerable doubt.

17122. And you took that into consideration when you told Mr. Lyne that, at all events, the contractors could make out a claim for £2,000? Yes.

17123. You had not overlooked the fact that you had previously relied upon this clause? Certainly not.

17124. And you used it, as Mr. Davis pointed out, to beat the contractors off if you possibly could? Yes; I could not describe it better than Mr. Davis has described it. I should explain that it was not a question of paying over a sum of money. If it had been, I should have sent the matter on to the Crown Solicitor for his opinion.

17125. At the time you wrote that minute as to the acceptance of the tender of Carter, Gummow, & Co. for Contract 79, did you know that Bond and Hudson had been bought off in the way you have since heard? I never heard of that until it came out in evidence before this Commission. It is not a thing of which, in any case, I should be likely to hear.

17126. But, as a matter of fact, it did not come to your knowledge in any way? No.

17127. If you had heard of it, your action would have been different? I think I should have taken different action if I had heard of it.

17128. To come to the next undue concession—the permitting of Messrs. Carter, Gummow, & Co. to obtain Contract 77 in an improper manner to the advantage of the contractors and to the disadvantage of the Crown;—you have already been examined at some length as to the action of the Tender Board taken on the joint recommendation of yourself and Mr. Darley, who had considered the matter of the Monier patent? Yes. (*Vide Appendix No. 69.*)

17129. If you refer to page 207 of the printed papers you will see that on the 27th March, 1895, Mr. Young wrote a minute, in which he says:—"Before approving of this proposal I should like an estimate of the actual value of the work to be carried out by the contractors under the substituted scheme." That was minuted on to you, and you wrote the minute already referred to under date of 28th March, 1895, in which you say:—"To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm, estimates were made for the work on the Monier system, as well as on the Department's designs. The result was that the estimate of both works was practically the same. Applying that comparison to this case, it would mean that the Departmental estimate for the work under consideration would be £22,000.—ROBT. HICKSON, 28/3/95. Under Secretary." With regard to that matter the quantities have since been taken out and various estimates have been made of the value of this portion of the work? Yes.

17130. Will you refer now to Mr. Davis's memorandum No. 5 which appears upon pages 506 and 507 of the evidence? Yes.

17131. He gives there an estimate founded upon quantities which I understand were agreed upon? Yes.

17132. You have gone into that matter—you understand it? Yes. I have not taken out the figures myself, but I know how Mr. Davis has done it.

17133. Are you satisfied, if you had complied with Mr. Young's request, and had gone into the matter fully at that stage, as to how the estimate would have worked out? I believe it would have worked out exactly in the way I indicated in my minute—in fact it would have been a little higher than the amount stated in Mr. Davis's memorandum, because I see that Mr. Davis's estimate is £3 16s. 10d. a yard, whereas Mr. Bagge in making his estimate put down the amount at £4. If I had sent the estimate back to Mr. Bagge, he would have put in the same figures again, so that it would have worked out a little higher than the estimate Mr. Davis has given.

17134. The experience you have gained from the actual construction of the work confirms you in the view you then laid before the Minister? Yes; and if I had the same circumstances before me to-morrow I should take exactly the same action.

17135. I understand you to say, first of all, therefore, that there was no undue concession made in regard to anyone of these three matters referred to? Certainly not.

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17136. In dealing with these matters were you influenced at all by the fact that your son happened to be in the employment of these contractors? Not in the slightest.
17137. Did it enter into your mind, in any way, in dealing with any of the three matters referred to? Not in any way. I hope I am above that sort of thing.
17138. I see that reference was made by Mr. Barling to the purchase of this patent. What have you to say as to that;—would it have been an advantage or not to the Department? I should not have done it at all, and, I think, he made a mistake in suggesting it. I understand that he himself has since been inclined to think that he made a mistake in that matter.
17139. You think it was better to pay a royalty than to buy the thing right out? Certainly.
17140. As to Contract 69 there are two charges there—charges 1 and 3—in respect of which Mr. Davis has given evidence upon page 496. You will see what he says in his memorandum, No. 1, with regard to speculative tendering? Yes.
17141. Do you agree with what he states there with reference to this matter? Yes.
17142. You have already given evidence as to the introduction by you of the new system of tendering. His Honor asked you about that some time ago? Yes.
17143. With regard to the item of £50 per square yard for bluestone pitching, which we have heard so much about, was that pointed out to you by Mr. Bagge? No; certainly not.
17144. And the first you heard of it was when Mr. Davis brought it under your notice, as he states, in his memorandum? The first I heard of it was the day on which he brought into my office the minute in his handwriting.
17145. Supposing your attention had been drawn to this item, which, I think in your former evidence, you have described as a most extravagant one, what action would you have recommended the Tender Board to take? That is a very difficult question to answer.
17146. Would you have thrown out the item? I do not think I should.
17147. Why not? What are the principles which would have guided you in determining a question of that sort from your point of view? I do not think it would have been fair to throw it out. I think it would have been a most inadvisable action for the Department to take—to alter the contractors' prices after their tender had come in. Of course, I need hardly say that I could not have taken out that particular item of £50 without increasing some of the other ridiculously low ones, and once that sort of work commenced it would be hard to say where it would end. Naturally the other contractors would strongly object to action of that sort. They would very fairly have said that had they known that that sort of work was to be done they would have liked, and should have been afforded an opportunity, to re-adjust their prices. The only thing that could have been done, now that I have had time to think about it, was to reject the whole lot of tenders and to adopt the system afterwards adopted, making it apply to this case. That, however, would have involved considerable delay. In the first place, I had not fully made up my mind then as to the advisableness of adopting this new system. I need not tell you that it is a very serious thing to alter a system which is in vogue all over the world, and which has worked fairly satisfactorily all through. It requires a good deal of consideration on the part of one engineer—who may be thought to have some fad on the subject—to alter a system such as that. I suppose I must have been six months thinking over the matter before I finally decided to adopt the change.
17148. So that on the whole you think you would not have been justified in throwing out this item, even if it had been pointed out to you? No. Of course it is easy to be wise after the event.
17149. With regard to the suggestion that these contractors must have got information from inside the Department, what do you say as to that? That is simply absurd on the face of it. Any person understanding how the Department is managed can see that that is simply impossible.
17150. Will you state shortly the course which is taken when tenders are called for in connection with any particular work? There are three sub-branches which deal with all contracts. There is the Survey Branch, which does all the field work and which knows everything in connection with it. Then, when the plans are plotted they are sent on to the Designing office. The work is there designed upon these plans, and the officers in that branch have not the remotest idea as to whether one portion may be left out, or another portion put in, or how the design will eventually be worked out. As soon as tenders are in and have been examined by them, the work is out of their hands and is sent on the Construction Branch. Suppose, for the sake of argument, some one in the Drawing Office was in the pay of a firm of contractors. He would first of all have to find out from the Survey Branch all the particulars as to what portion of the work was likely to be left out and what portion was likely to be put in. To do that it would be necessary for him to put himself in communication with every surveyor, because all connected with these contracts do some work in connection with them. Then, when a certain tender had been accepted, this person would have to go through the same operation with the Construction Branch, and he could not ask one Resident Engineer whether he would leave out this item or put in that, because he would not know who the Resident Engineer would be. He would have to go to every officer in the Construction Branch, and I have a good deal too much faith in the officers I have had there under me, from Mr. Bagge downwards, to think that such a thing would be possible. You will see, therefore, that before the supposititious person to whom I have referred could do anything, every officer in the Department would have to be mixed up in the business.
17151. Even then the information obtained might not be of much use, because the Resident Engineer in charge of the work might be changed? Quite so. I have just pointed out that the Resident Engineer would not be known.
17152. It comes to this, therefore, that even if the contractors did get information in the way you have suggested it could not be relied upon? No.
17153. The only person who could be squared with any advantage, according to Mr. Chamier, would be the Engineer-in-Chief? Then, again, I should have to square all my officers. I have not tried that, and I do not know what success I should meet with.
17154. You heard the evidence of Mr. Gilliver about the cutting out of a bridge on one of his contracts? I read it.
17155. I think the effect of his evidence was that you ought to have dealt with this item of bluestone pitchers in connection with Contract 69 in just the same way that you dealt with his bridge? That apparently is what he thought.
17156. Will you explain in what way the cases are not parallel? They are totally different cases. First  
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of all, I should tell you that the bridge ought not to have been put in. It was a mistake, and it was left out, not because it was a bad-paying or a good-paying item. I do not know whether the contractors would have lost or made anything upon it, but it was left out because, in my opinion, it was a work which ought not to have been charged to the ratepayers of Sydney. It was not required for the pipe line. All that we required was what we put in at the time—a trestle bridge. As regards a traffic bridge, I maintain that it would have been unfair to charge the ratepayers of the whole suburban area with the cost of such a bridge, which was required only for local purposes. As to the pitching, it was specified for, and the work had to be carried out. I certainly should not have been justified in taking it out because it happened to be a big paying item, unless at the same time I had been prepared to increase some of the low paying items, which would have been a most dangerous thing to do.

17157. Let me refer you to charge No. 2, under the heading of Contract 69. Allowing the contract to be taken up by Carter, Gummow, & Co. with an insufficient bond, and with ultimately breaking that bond by remitting the retention money, and writing a minute by which the Minister was deceived and induced to consent. In connection with that charge I should like to refer you to Mr. Davis' memorandum, which appears upon page 501 of the printed evidence;—you confirm that? Yes.

17158. You will see that Mr. Christie referred to the minute which was written by you with regard to these sureties in his evidence, on page 381; you will see that he states that Mr. Davis, in his minute, refers to the sureties by the names of the firms; they are referred to by the contractors, first of all, by the names of their firm; what have you to say as to that—that is, as to the way in which you would regard individuals who had given their names in a bond of this kind;—would you consider the firms of which they were members? Yes, certainly.

17159. And if the firms were strong firms, would you be content? Yes.

17160. So that there is nothing misleading in that minute in so far as it refers to those sureties in a general way by the names of the firms? No, certainly not. I, myself, certainly had no intention to mislead.

17161. Mr. Christie says, also, that the usual declaration as to the possession of property to the amount of the bond was not obtained;—was it usual to take a declaration when you knew the men? No declaration was taken at that time; it was not the custom to take them. I think Mr. Norrie introduced that practice.

17162. If you satisfied yourself on inquiry that the men were substantial men, it was not usual to take a declaration? No, it was not the custom.

17163. Let me refer you to Mr. Davis' memorandum No. 3, which appears upon page 502 of the printed evidence; you will see that it deals with the charges as to the advances on cement made to Messrs. Carter & Co. on Contracts 69, 79, and 79 A;—are the statements contained in that memorandum correct? Yes; I think they are quite correct.

17164. And the same with regard to the memorandum No. 6 that appears upon page 503 of the printed evidence—I mean the memorandum as to guttering and gadding? Yes.

17165. As to the matter of the unwatering of Contract 118, what have you to say as to that;—it was done under your instructions, was it not? It was done under my orders, and all I can say in regard to it is, that if I were put in a similar position to-morrow, I should do the same thing.

17166. It was Mr. Millner, the officer-in-charge of the contract, who first drew Mr. Davis' attention to the matter? I do not know who first drew his attention to it.

17167. At all events, Mr. Davis reported it to you, and you went out and looked at it? My attention was first drawn to it by the contractors, I think, and also by our own dredge-master. The dredge-master said to me "We are flooding the contractors out. I should like you to come out and have a look at it. We shall have to stop the dredge work or make some other arrangement." I went out the same day and went over the ground with Mr. Carter and the dredge-master. Of course it was at once patent to any person that we should have to take steps to prevent the flooding.

17168. You had brought the water there, and it was your business to take it off again? Yes.

17169. And you would take the same action to-morrow in similar circumstances? Yes.

17170. The clause in the specification as to unwatering had nothing whatever to do with a case of that kind? No; it does not follow that because you have a clause binding the contractor as to unwatering you are at liberty to turn a waterspout on to his work. The point is too absurd to admit of argument.

17171. I think Mr. Parkes in his evidence referred to what he called a parallel case, where he said the Department took exactly opposite action. Let me refer you to page 489, of the printed evidence, question 15,281. The document I hand you is a letter from Mr. Foord, the contractor in the case referred to by Mr. Parkes? Yes. Mr. Foord says, "I beg to inform you that, owing to being misinformed as to the locality of the Evans River scheme, I don't see anything but loss in it; so I don't see my way clear to accept the contract." The matter was referred to Mr. Carlton for report, and he says "I recommend that Mr. Charles Foord's deposit be forfeited, and the next lowest tender for scheme No. 2, that of Mr. Taylor, be accepted for the lump sum of £2,549 5s. 6d. We shall still be £150 inside our estimate for the work. I notice Mr. Taylor only deposited £14 instead of £26 with his tender." Mr. Darley, who was in charge of the work, concurred.

17172. *His Honor.*] What is the date of the contractor's letter? 14th March, 1895. Mr. Darley was then Engineer-in-Chief for Harbours and Rivers.

17173. You had not to deal with the matter? Not until afterwards, when another contractor went on with the job. I think Mr. Parkes must have been referring to Taylor.

17174. What became of Taylor? He was accepted as the contractor under Mr. Darley. The matter first came under my notice when Taylor came to tell me that he could not go on with the job.

17175. Why not? He had too low a price. That was really the reason. Perhaps I had better explain the matter. Alternative tenders were invited for cutting a channel through what is called the iron gates. It is not sand at all, but hard material, as the name implies. One design was for a broad and shallow channel and the other for a narrow and deep one. Mr. Darley recommended the acceptance of Taylor's tender for the narrow and deep channel. He started the work and took out the channel a certain depth, and he then came to the office and said he could not finish the work. He asked me, I being then in charge of the work, to let him take up the alternative design, for which he had not tendered at all. I told him in the first place that such a thing could not be thought of, and that in the second place it was not as good a channel. Mr. Parkes never came to see me with Mr. Taylor, but he came into the office to see Mr. Barling. I happened to be in the room at the time, and I explained the circumstances to Mr. Barling.

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There was no question about silting up. It was a question of excavating the hard material. I understood that Mr. Parkes went away satisfied that the view I took was the correct one.

17176. What was done? Taylor threw the contract up.

17177. He made an application for compensation; he wrote a letter and he afterwards saw you? Yes; he wrote the following letter on December 12, 1895:—

12 December, 1895.

HAVING been dissatisfied with the measurements shown in returns made on my contract for widening and deepening the channel of Evans River, at Iron Gates, I decided to take an engineer from Sydney, to take measurements in conjunction with the Departmental officers; and after he had carefully measured and calculated the whole of the measurements taken, and checked same, he submitted his report to me of the work. I find there is only 150 cubic yards difference between them in the amount of excavation yet to be done, my engineer being that amount in excess of the Departmental engineer's calculation.

From observations and measurements carefully made of spoil banks where material excavated had been deposited, and after making due allowance for gain by removal, and without taking into consideration spoil deposited in deep water holes and other inaccessible places, he estimates that I have removed several thousand cubic yards more than I have been given credit for. The spoil banks have been entirely made up of material taken from above low-water level, which confirms my opinion that I have had a far greater amount of material to remove than was given in schedule of quantities for contractors' guidance to tender by, and not doubting at the time but that the quantities given were correct tendered accordingly.

It was not until I had removed a considerable quantity of the material in No. 1 and No. 3 on schedule, which gave me the impression that the quantities as given in schedule were incorrect.

As the quantity of material yet to be removed exceeds 5,085 cubic yards, the whole of which is practically below low-water level, and when this amount is deducted from quantities given in schedule, namely, 6,353 cubic yards, it only gives me credit for having removed 1,268 cubic yards.

I am confident that I have removed more than double that amount, as this material has been removed by dredging and other means and conveyed by punts to the deep water, where it has been deposited, which enables me to keep a check and to form a fair estimate of the quantity of material so removed.

Being now over time from 15th August to date, a period of eighteen weeks, and the penalties being levied and deducted from monthly payments, making the amounts payable to me so small as to be insufficient to even pay half working expenses.

And as I have already had a loss of over £1,000 on the work up to date, which renders me unable to meet present liabilities on the work.

In view of the above facts, I would respectfully request that you relieve me of the contract and allow me some fair compensation to meet existing liabilities.

That was sent on to Mr. Carleton on the 13th for report, and in the meantime Mr. Taylor saw me. I wrote the following minute, I find, "This telegram has been verbally confirmed by Mr. Taylor himself to-day. I recommend that the contract be cancelled. I have wired to Mr. Keele to advise as to the completion of the work. The question of Taylor's disqualification might be considered at the next meeting of the Board of Reference." The telegram there referred to would be a telegram which appears to have been detached from the paper. When Mr. Taylor was in my room talking to me, and asking for compensation for the apparent short measurement, I received the following telegram, "Mr. Napier went out to-day to Iron Gates to measure up for progress payment on Taylor's contract, but found the contractor and his men gone, and all the plant removed. He has left no one there to represent him, and, from information received, Mr. Napier has come to the conclusion that he has thrown up the contract." I showed Taylor that telegram, and I said "Is it true, Taylor, that you have actually taken away your plant, and have left the work?" He said it was the case, and I then said "Leave my room at once. You will have to apply to someone else for consideration."

17178. If you refer to page 335 of the printed papers in connection with Contract 79A you will see that on 22nd March, 1894, you wrote a minute which ends with these words, "I believe, however, if tenders were invited we could get work done under the office estimate"—that was your opinion at the time, and you still held that opinion when you saw the Minister? Yes. (*Vide Appendix No. 73.*)

17179. Mr. Lyne has been examined by the Commission, and has said in reference to the letting of that contract that he took the responsibility of it—is it not a fact that you were still of opinion that you could get the work done under the office estimate if you had called for tenders? I am under that impression still.

17180. In the next minute you said you had received an intimation from the Minister that he was prepared to let the contract to Messrs. Carter & Co. upon certain terms, and upon that you acted? Yes; Mr. Lyne gave me that information in the presence of Mr. E. M. Clark.

17181. So that there was no change in your mind at all? No; I never changed my mind about the matter.

17182. The contract was let, as Mr. Lyne told us, on his responsibility? Yes. Of course, he would not deny that.

17183. With regard to these papers you had nothing to do with preparing the Return for Parliament? No; I never interfered with that work at all.

17184. *Mr. Gummow.*] In connection with the alteration of the system of tendering—that is from the old system under which the contractors put in their own prices to the new system under which you put in prices—you said you gave that matter consideration for some time before making the change? Yes.

17185. Was it on account of the large prices that Carter, Gummow, & Co. put in that you finally decided that an alteration was necessary? Not entirely. You were all pretty much in the same boat.

17186. But, as a matter of fact, Carter, Gummow, & Co. did take advantage of the old system, and did put in large and small prices? Certainly.

17187. So that really when you made the alteration it was a blow at the contractors, and at Carter, Gummow, & Co., in particular? It was a blow at all the contractors.

17188. But Carter, Gummow, & Co. were taking advantage of the system? The change was not a blow at any contractors in particular. It was a blow at the system which I believed to be bad.

17189. As to the Johnstone's Creek works, and the cutting of the drain—is not the drain necessary at the present time for the carrying away of surplus water that falls on the area just above the creek? We could not carry out the extension of the storm-water sewer through the reclamation until that drain was cut.

17190. The contract of Carter, Gummow, & Co. came to a dead end; they had no outlet? When tenders were called they had an outlet, but when they started the work the outlet had been closed up by the reclamation works.

17191. Are you still keeping open the channel which you cut? Yes. The Minister approved the other day of an expenditure for widening and deepening it, and for cleaning it out.

17192.



17192. This particular channel? A part of it.

17193. Is that expenditure to the benefit of Carter, Gummow, & Co.? No; their work is finished, I understand.

17194. *Mr. Smith.*] I believe reports have been laid upon the Table of the House, from various officers, with reference to Contracts 101 and 64, which were referred to by Mr. M'Creddie in his evidence? Yes.

17195. Whose reports are they? They are reports by Mr. Carleton, Mr. Davis, Mr. Smail, and Mr. Darley. The following are the papers:—

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I FORWARD herewith, for the information of the Minister, reports from Messrs. Davis, Smail, and Carleton, in connection with this work. Under ordinary circumstances, I would have deemed it sufficient to obtain Mr. Davis's report; but, considering the alarming statements that have been made in connection with these sewers, I thought it advisable, in addition to Mr. Davis, to have the work inspected by Mr. Carleton, who has had a very long experience in concrete work, and Mr. Smail, who, in addition to his experience in sewerage works, will be responsible for these sewers when they are handed over by the department to the Board.

I think the Minister will concur with me that the statements that have been made in connection with these works are totally unfounded, and what has taken place is what any engineer of experience would expect in similar construction.

It must be remembered these sewers have had a very severe trial, in that they have been lying idle for such a long time, and exposed to an extreme winter. I am of opinion that when they come to be used, and are subjected to the uniform temperature which is met with in all sewers in use, this contraction and expansion will practically disappear, and the sewers be perfectly watertight.

ROB. HICKSON.

13 August, 1896.

IN accordance with your instructions I examined the triplicate sewers at Arncliffe to-day in the company of Messrs. Smail and Davis, with reference to the cracks which have appeared in the concrete work of the arches and carriers.

Two kinds of concrete have been used in the structures—7 to 1 sandstone concrete in the spandrills of the arches up to the level of the crown of the extrados, 6 to 1 bluestone concrete in the lower half of the sewers, and 7 to 1 sandstone concrete in the upper half up to the top of the structure.

Two series of cracks present themselves—one a horizontal crack at the junctions of the different kinds of concrete; the other series appear as vertical and diagonal cracks, which, in some instances, run from top to bottom of the concrete, principally at junctions between what may be called new and old work, or where the concreting has not been carried on continuously.

The structure is decidedly massive, and neither kinds of cracks, in my opinion, imperil the stability or usefulness of the aqueducts.

The horizontal cracks between the two kinds of concrete might, I think, have been avoided by the use of one class of concrete throughout.

Both sets of cracks are due to variations in temperature; and the second set are common to all large masses of concrete which are exposed to a considerable range of temperature.

I do not consider any action necessary at present. There will no doubt be some slight leakage on the first admission of sewerage to the carriers, but I believe the cracks will soon become choked with sediment, and that the sewers will be practically dry externally within six months of their being brought into action.

It may, however, be found desirable hereafter to rake out a few of the more prominent transverse cracks and fill them in with mastic, so as to form permanent expansion joints. The cost of this would be trifling.

If, however, it is thought necessary to prevent any leakage of sewerage even at the commencement, this could be done now by putting in temporary bulkheads at each end of the aqueducts, and filling the sewers with water, when the sediment deposited by soakage through the cracks will soon close them up.

The few small cracks which are visible in the aqueduct between Rocky Point Road and the Illawarra Railway are so slight that they are of no practical importance.

I might mention that I had actual charge of a work where very similar action took place. A large concrete dam for the Orange Water Works, 30 feet in height, and nearly  $\frac{1}{4}$  of a mile long, was constructed during the summer months. On the first appearance of winter, cracks appeared in the dam, and leakage took place through them. The increase and decrease in the width of the cracks was readily detected by measuring the variation in the quantity of water passing through them, and this increase was clearly shown to be coincident with marked falls in the temperature. No remedy was considered necessary, and the cracks very soon became choked with sediment, and the leakage is now practically nil. The same result may be looked for with confidence in the Arncliffe sewers.

It has, I believe, been proposed to form a bank of earth or sand covering the whole structure. This, however, I consider an unnecessary expense.

H. R. CARLETON.

13th August, 1896.

IN company with Messrs. Smail and Carleton, this afternoon, I made an examination of the aqueducts across the Sewage Farm at Arncliffe, constructed under Contract No. 101, by Mr. John Ahearn, and aqueduct No. 3 lying between Rocky Point Road and the Illawarra Railway, constructed under Contract No. 64, by Mr. J. F. Carson.

They are both 6-ft. triplicate circular sewers, and are built on sandstone concrete piers, and 27' 6" span brick arches, the spandrills being sandstone concrete.

The sewer in the latter case is of brick and bluestone concrete, and the former, bluestone and sandstone concrete. The piers in the Contract No. 64 aqueduct are built upon piles, and those in Contract No. 101 on good clean firm sand.

There were several vertical cracks varying from 1-16th inch to 1-8th inch in width, and evidently occurring at the junction of two lengths of concrete, this being the point where the structure would be least able to stand the tensile stress which would be set up by the contraction.

There is also a small longitudinal crack extending more or less along the length of the aqueduct, at the springing of the arches of the sewer, where the bluestone concrete in the invert joins the sandstone concrete in the arches.

I am of opinion that no settlement has taken place, and that the cracks are caused by the contraction of the materials forming the structure.

In my judgment there have been two movements, to some extent independent of each other. Firstly, the material composing the aqueducts, arches, and spandrills, has shrunk longitudinally under the low temperature which has of late been experienced; and as the concrete was not sufficiently elastic to accommodate itself to this variation of temperature, vertical cracks have occurred at intervals along the length and at right angles to the axis of the sewer. If the aggregate width of the cracks is taken, it indicates that the movement is very slight, but even this has proved sufficient to cause fracture in so rigid a material.

Secondly, the expansion and contraction of sandstone and bluestone concrete are not equal, although the difference is so small that ordinarily it is imperceptible. This difference of movement, when taken for a long length of concrete, as is the case in question, so accumulates that it has had the effect of breaking the joint between the bluestone and sandstone concrete at the springing of the arches of the sewer. The cross section attached illustrates where the bond is broken between the two kinds of concrete.

Neither the vertical nor the longitudinal cracks will decrease the utility of the sewer, and for all practical purposes may be considered of no consequence, nor can it be said that the stability of the structure has been impaired. The cracks will completely close up during the summer, and before another winter the sewer will be in use, when the sewage will have the effect of keeping the concrete at a more uniform temperature, and make it not so liable to be affected by climatic changes.

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It is very common for cracks to occur in concrete work. Indeed it would be difficult to find any of the length and magnitude of contract No. 101 where they have not occurred.

In practice it is found that should they at first cause an escape of water, in a short time they stanch themselves. No bad effects are therefore anticipated from those in question; but, before the sewer is used, it will be an easy matter, should it be considered necessary, to insert a mastic joint at the points where the vertical cracks have occurred. It will be little use otherwise repairing them beyond this, as in all probability the contraction will occur, only to a less degree, each winter. Last winter, in the portion of the aqueduct completed, this occurred, and, before the work was taken over from the Contractor, he was asked to repair them, but they reopened this year.

Regarding the aqueduct on contract No. 64, there are several small cracks at the base of the spandrels, but they are of so little moment that it is not considered they call for remark. They certainly do not militate against the stability, utility, or appearance of the work.

J. DAVIS.

13th August, 1896.

I VISITED the above works in company with Mr. Carlton and Mr. Davis, and after inspection of both Aqueducts, I beg to submit the following report, viz. :—

*No. 4 Aqueduct, Contract No. 101, John Ahearn, Contractor.*—I inspected these works several times during the latter part of the contract while acting as Engineer-in-Chief for the Minister, and noticed that the concrete showed signs of cracking at different points; these appeared at places where same could naturally have been expected in works of this nature, and carried out in such exposed positions to varying changes of temperature. When contract was approaching completion the then Supervising Engineer, Mr. Griffiths, reported that the Resident Engineer, Mr. Smith, drew his attention to certain movements in the arches and superstructure at far end. The work was inspected, and tests were applied, which would show whether the movement was due to defective foundations or otherwise. The levels taken by Mr. Smith clearly indicated that movements were not due to sinking of piers, even to the smallest extent. Paper tests also showed that no opening movement beyond that showing at the time occurred in the piers, nor has any occurred since. With regard to cracks in superstructure, the line of cracks shows what might be expected, and what has actually occurred in an aqueduct in the older portion of the farm, constructed by Mr. John Young, contractor, over ten years ago. The cracks referred to took place at the point of junction between two lengths where "racking back" occurred. This mode of joining lengths was the plan adopted, and has since been continued, in order to obtain as far as possible a homogeneous mass. Notwithstanding all precautions taken cracks afterwards appeared, but were not interfered with, as experience showed that any leaks which occurred in first instance eventually "took up," and aqueduct served the purposes for which it was intended. Observations of their length and that of main carrier for a period of ten years showed that cracks which could be easily detected in cold seasons, in hot weather it would be difficult to find. This clearly demonstrates that in concrete structures, where any partition occurs it is due to the natural contraction of the material, and further that the cracks open and close according to the temperature, assuming work has been faithfully carried out. In the light of experience I attribute the cracks in superstructure to contraction and not to defective work, as I have every reason to believe that the work has been faithfully executed. I think with the construction of the distributing chamber and connecting up of the triplicate sewers no longitudinal movement will take place, and that existing cracks are not detrimental to the stability of the structure. I think it would be advisable not to come to any conclusion until the hot weather sets in, when it could be settled beyond a doubt whether the cracks which now are visible will close up or not. If this takes place, which I think it will, the cracks could be attended to, and when sewage is flowing in sewer the internal temperature will be more uniform, and any weepage will take up, as it has in other cases. I am informed it is suggested that the superstructure should be removed and triplicate line of pipes substituted, also that existing structure should be covered with earth in embankment. I am of opinion that it would be wasting money to carry out either suggestion.

*Aqueduct No. 3, Contract 64, Carson, Contractor.*—This structure was closely inspected, and with the exception of a few hair-cracks in cement near springing of arches incidental to such work, there is no difference in the work now than when I last saw it a few years ago: the only deterioration was in the stone string courses which showed signs of fretting in one place, this can be prevented by coating the surface with oil. I do not consider there is any cause for complaint in this work.

J. M. SMAIL.

21 August, 1896.

I, THIS day, examined the condition of Contract No. 101, which has been reported to be exhibiting some defects. The length of this contract was about 28 chains, and consists of three 6-ft diameter sewers, forming a triplicate sewer, carried on 18-in. brick arches, 24 feet spans, resting on concrete piers, the superstructure above the arches being composed of rich blue-stone concrete up to line of centre of sewers, and above that of sandstone concrete of a poorer quality; the inside of sewers and external exposed face of concrete being rendered with cement mortar. Almost throughout the whole length of the carrier a horizontal crack or parting is visible in the rendering, along the line of junction of the two classes of concrete.

I attribute no importance to this defect—it is an eyesore certainly, but no more, for it is hardly traceable on the inside.

There is, apparently, a want of unison in the two materials, one probably contracting a little more than the other on the outside, where exposed to a range of temperature. In the interests of economy in designing large works, it would appear a very proper course to adopt, viz., to place a less expensive material where it has but little more to do than act as a covering; but, with the experience now, I think, for the first time gained, of the result of such an experiment, I would not repeat it, where placed in an exposed situation. I feel sure, however, that the defect will get no worse, and that it will give no further trouble.

There are, however, about six transverse cracks through the superstructure; three appear to go down to head of arch only, but three show right through arch and carrier. These cracks are due to contraction in the long line of concrete work, and there is evidence that they give and take a little with change of temperature—being more open on the southern, or shady side, than on the north, or warmer side.

Some of these cracks were visible before the contract was quite complete, the rendering having been cut out and replaced by the contractor, but the defect is still visible, and must remain so while the structure expands and contracts.

From my experience of concrete I know it is practically impossible ever to construct a long line of rigid work and prevent its cracking by contraction. In marine work, such as a continuous parapet on a breakwater, it is usual to provide dry partings at intervals, to allow of movement taking place, and thus avoid unsightly cracks, but in such works, of course, water tightness has not to be studied. In the structure in question, the cracks are an eyesore, but I do not look upon them as a serious defect; and, with proper treatment before the sewer is about to be brought into use, they can be made quite staunch and not likely to give any further trouble.

This carrier was practically completed when I took charge of the Sewerage Construction works last year; and, when on my first inspection I saw the cracks, I decided to leave them alone until shortly before the sewers were to be used, and then to open out along the line of transverse cracks, and stop them inside with mastic asphalt. This material has, in many similar cases, been used most successfully, notably so by Sir John Fowler, in stopping cracks which caused much trouble in a very large and high service reservoir connected with the Colombo Water Supply, where water has to be stored to a depth of about 50 feet; thus the mastic stopping has to resist a very high pressure; but, in the sewer in question, the pressure is very slight, so I have not the least doubt as to its success in permanently remedying the defect and preventing leakage.

One great advantage of the mastic is that it will allow the carrier to expand and contract with change of seasons, and still remain quite tight.

To sum up—I look upon the cracks as almost, if not quite, unavoidable, in such a rigid structure—at the same time, they are a more apparent than a real defect, and can be easily treated in a way that will permanently stop them from causing any trouble.

C. W. DARLEY.

WITH

22 August, 1896.

R. R. P.  
Hickson.

14 Sept., 1896.

WITH further reference to my minute of the 14th instant, I have the honor to report that in obedience to your instructions I made a very careful examination, to-day, of Contract No. 101, and also that portion of Contract 64 lying between the Illawarra Railway and the Rocky Point Road. These works form portion of the Western Suburbs 6 feet Triplicate Circular Outfall Sewer. The work comprised in Contract 101, which is about 28 chains in length, is constructed as follows:—

Concrete piers carried an average of 7 feet below the surface of the ground on to clean sand, brick arches 18 inches thick, and a superstructure as follows—spandrels, sandstone concrete, invert of sewer bluestone concrete, the upper portion of sewer sandstone concrete, and the whole covered with a coating of asphalt. The inside of barrels and external face of concrete is rendered with cement mortar.

The portion of Contract 64 referred to is constructed as follows:—

Concrete piers resting on a pile foundation, brick arches 18 inches thick, the superstructure differing from 101 in that the upper halves of the barrels are constructed in brick, and the sides of the aqueduct faced with brickwork; the barrels and external face of cement being rendered, and the top covered with asphalt.

In Contract 101, there are a number of horizontal as well as vertical cracks to be seen on the outside, and to a much lesser extent on the inside of the two external barrels, the centre barrel being practically without a flaw; while in Contract 64 there are only a very few horizontal hair-cracks on the inside and no vertical cracks to be seen. The horizontal cracks in both cases are undoubtedly due to the unequal contraction and expansion of bluestone and sandstone concretes and brickwork, and the vertical cracks in Contract 101 are caused by the contraction of the structure during the late cold weather.

Careful levels have been taken, and these show that no settlement whatever has taken place, and the cracks are therefore solely caused by the contraction of the material of which the structure is composed. In hot weather no doubt expansion will take place and the cracks close up. Indeed, evidence of this was to be seen to-day, as the substance washed into the cracks was being squeezed out, clearly indicating that the warm weather was causing expansion and closing them up. That no vertical cracks are to be seen in Contract 64 is probably due to the fact that the expansion and contraction are absorbed in the joints of the brickwork, and cannot therefore be detected.

When it is remembered that these sewers have not yet been put in use, and have not therefore been subject to the equable temperature that is found in all sewers in which sewage is flowing, and also that concrete contracts and expands almost exactly in the same ratio as iron, I think it will be admitted that what has happened is only what might have been expected.

I entirely agree with Messrs. Darley, Davis, Smail, and Carleton, that these cracks are of no importance, and that when the sewer is brought into steady use they will more than likely entirely disappear, or, if not, be easily and cheaply stopped by the aid of mastic joints. I might add that I examined the Orange Dam mentioned by Mr. Carleton, and I am confident that, if any one not understanding the action of concrete had seen the leaks in that structure, reports of a much more alarming character than even those circulated in regard to the Arncliffe Sewers could have been made.

It was observed when Contract 62 was in course of construction, that those portions of the triplicate sewer similarly designed to Contract 64, when exposed to the atmosphere, showed horizontal cracks at the junction of the bluestone concrete and brickwork, and I drew the attention of Mr. Oswald Browne, M.Inst.C.E., one of the leading sanitary engineers in London, who happened to be at the time on a visit to Sydney, to the matter. He then told me that contraction must be expected in such large concrete structures, but when the sewers came into use the cracks would close up with sediment and the sewer would be watertight.

A statement has been made that this work would have to be taken down and an iron pipe put up at a cost of from £20,000 to £30,000. It is difficult to understand how a person with any knowledge of concrete structures could make such an assertion. There would be no justification whatsoever for this expenditure, which could only be designated as a waste of public funds, or indeed for in any way interfering with the existing structure, except that it may, as I said before, be found desirable to fill up some of the cracks with mastic; but even the necessity for this trifling expenditure is very doubtful.

When I took charge of the Sewerage Construction Works the designs for the pipe structures across Wollie Creek and the Cook's River Valley had been practically settled upon. On carefully considering the matter, I thought that a cheaper design could be introduced between the Rocky Point Road and the railway; and, on going further into the portion of the work where sightliness had not to be taken so much into account, a still further reduction was made in Contract No. 101. That I have been successful in my efforts to secure economy in construction, while maintaining the efficiency of the work, is, I think, conclusively shown by the following comparison of cost:—

|  | £  | s. | d. |           |
|--|----|----|----|-----------|
| Iron-pipe triplicate sewer on brick arches as constructed across Cook's River and Wollie Creek Valleys...                          | 32 | 6  | 2  | per foot. |
| Bluestone concrete and brick triplicate sewer on brick arches, as constructed between Rocky Point Road and South Coast Railway ... | 16 | 18 | 10 | „         |
| Bluestone concrete and sandstone concrete triplicate sewer on brick arches, as adopted in Contract 101 ...                         | 10 | 19 | 0  | „         |

NOTE.—In order to ensure a fair comparison, the cost of these works has only been taken from the ground upwards.

A comparison has been made between the Wollie Creek and Cook's River Works and Contract No. 101, with a view of depreciating the latter. While there is no doubt the former are most substantial and slightly structures, I submit that it is quite possible to attain this end at too great a cost. There is not much engineering skill displayed in designing work without regard to cost, and I maintain that Contract No. 101 is a vast improvement, from an engineering point of view, on the pipe structures at Wollie Creek and Cook's River.

Taking these facts into consideration, I am quite satisfied that any engineer of experience will say that the economy effected in the construction of these works was a wise and judicious one, and would much more than compensate for a few apparent defects which, as Mr. Darley points out, are nothing more than eye-sores.

ROBT. HICKSON.

24 August, 1896.

WITH reference to the Minister's request to be furnished with a report as to the circumstances under which the works comprised in these contracts came to be carried out before they could be put to use, I beg to submit the following particulars for his information:—

The sewerage works for the western suburbs were sanctioned by Parliament in September, 1889, and it was the full intention of the department to carry out the scheme in such a way as to permit of portions of it, at any rate, being utilised and made revenue-producing before the works, as a whole, were completed. That is to say, it was proposed to first push on and complete the outfall works so that as each of the subsidiary main sewers were finished and connected therewith, they might be made use of.

The outfall works proper are comprised in four contracts or sections, viz., Contracts 62, 64, 101, and 112. The plans were proceeded with as quickly as could possibly have been done, and a tender was accepted for Contract 62 in July, 1890, the time for completion being two years from that date.

Contract 64 was the next to be undertaken. This was started in March, 1891, two years being allowed for completion, and No. 101 was let in December, 1893, to be completed in March, 1895.

The remaining section, viz., Contract 112, which is the extension of the main carrier across the sewage farm, was not, however, put in hand until March, 1895. The work is now in progress and the contract time expires on the 8th December next.

When this contract is finished the outfall works will be practically complete, and such portions of the sewers as are ready can then be utilised, and the same can be done with the succeeding portions of the work as they are finished.

The delay which took place in proceeding with Contracts 101 and 112 was quite outside the control of the department, and was entirely due to the difficulties which arose in connection with the obtaining of Loan funds. Had the money been available to permit of the contracts being let as the plans became completed, a delay of quite two years might have been avoided, and the outfall would long ago have been completed and in use.

The

R. R. P.  
Hickson.  
14 Sept., 1896.

The difficulties which I refer to may be said to have commenced about the end of 1891. At that time our funds began to run short, and between March, 1892, when Contract 79 (part of the North Shore works) was let, and December, 1893, when Contract 101 was accepted, no sewerage contracts of any importance were entered upon. Indeed it was only by adopting the expedient of paying contractors in Funded Stock that we were able to make a fresh start and push on with the works.

Matters, however, righted themselves during 1894, and we were able to proceed more satisfactorily, and I trust that with the improved financial conditions of the Colony we shall not experience any future trouble of this kind.

During the period of the delay to which I have referred, I many times drew attention to its effect in retarding the proper progress of sewerage construction work. I cannot, at the moment, refer to all my minutes on the subject, as they are so scattered amongst the many papers relating to the various contracts; and, as many of these papers are with the Parkes Inquiry Commission just now, they are difficult of access. I might, however, refer the Minister to my report of 18th September, 1893, in which the policy of the Department in regard to the sewerage construction work was reviewed, and the financial position, as it stood at that time, was, I think, very clearly set out. A few quotations from that report will not, perhaps, be out of place. I then said:—

“The financial aspect of the question, therefore, calls for serious consideration.”

“Seeing that the heaviest expenditure is involved in the construction of the main outfall sewers, that these must be undertaken first, although unremunerative, and that the cost of the sewers gradually diminishes as the limits of the system are reached, while the area drained increases, the best financial results would undoubtedly be obtained by completing the works to the payable limit as rapidly as possible. Realising this, and that it was of the greatest importance to reduce the burden of loan expenditure involved to a minimum, and to remove, as soon as possible, the incidence of the payment of interest from the Colony generally to the community benefited, it has been the policy of the Department to construct first those sections from which a revenue would be most immediately derivable.”

Again: “The great importance of proceeding with further sections of the Western Suburbs drainage is, I think, undoubted.”

“On the Main Western Outfall Sewer, which is the key to the whole western system, an expenditure of £185,257 has been incurred, and a liability remains on existing contracts of £26,100. In addition to these sums, £60,000 will be required for the completion of the sewer and the preparation of the sewage farm. No revenue whatever can be obtained from this expenditure of £271,357, over two-thirds of which has been already paid, till the most important branches have been completed.”

\* \* \* \* \*  
“I would suggest for the consideration of the Minister the advisability of making arrangements for the expenditure of a certain sum (the larger the better) annually for the carrying on of the works.

“With a definite sum to expend the Department would be enabled to so arrange the contracts as to lay out the money to the best advantage and to obtain the most speedy return.”

I could refer to other reports, but I think the foregoing will be sufficient to show that it was the intention of the Department to proceed with these works systematically, and in no haphazard fashion, and that the causes which led to our plans being upset, and one effect of which is that the works included in the particular contracts under consideration must for a time lie idle, were such as could not well have been foreseen or avoided.

R. R. P. HICKSON.

I attach special importance to Mr. Smail's report because he was the officer responsible for taking over the work. In putting the reports before the Commission, I should also like to say this—that the whole of them have been written separately—that is to say that the officers did not go into the reports together. I believe I am correct in saying that these reports were written at their own homes at night, and that the officers did not know until they had sent in their reports what each officer had said.

17196. *Mr. Parkes.*] Are they officers of the department? Yes; I hope we have officers of the department who are able to give straightforward, truthful, reports.

George Maddison recalled and further examined:—

G. Maddison. 17197. *Mr. Parkes.*] You wish to make a statement to His Honor? Yes, with reference to the books which were supposed to be kept. I understood that books were being kept by the firm, and the reason I have for saying so is that Mr. Carter said one day at Marrickville that he was the bookkeeper, and that if he had anything to do with the matter he would keep no books.

17198. *His Honor.*] When was that? Before our dissolution of partnership.

17199. At about what date? I could not state.

17200. About how long was it before you dissolved partnership? From two to three months, as nearly as I could say.

17201. *Mr. Parkes.*] Do you know as a matter of fact whether books were kept? That I could not say. I never saw any.

17202. Have you anything further to say? Only this: when the dissolution did take place Mr. Carter asked me if I had any objection to Mr. Gummow going through the books, and I said that I had not the slightest.

17203. Where were the books kept, supposing that there were any? I could not say. I remember Mr. Gummow asking some questions about the matter, and I remember telling him that we were quite agreeable to his going through the books to see that justice was done.

17204. Had you not access to all the books and to everything belonging to the partnership? I never bothered or made any inquiries about it at all. There is always a certain amount of trust among men.

John Christian Henry Rudolph sworn and examined:—

J. C. H. Rudolph. 17205. *Mr. Davis.*] What is your position in the department? I am resident engineer.  
17206. How long is it since you supervised any works of Carter, Gummow, & Co., or any members of the firm? Not since the beginning of 1892.

14 Sept., 1896. 17207. At the beginning of 1892, after you had ceased to have any supervision of work for the firm, did you borrow any money from Carter, Gummow, & Co.? Not from Carter, Gummow, & Co., but from Mr. Carter.

17208. How much did you borrow? £250.

17209. Will you tell His Honor the circumstances under which you borrowed the money? In April, 1892, I bought a property at Marrickville, and not having sufficient purchase money I borrowed £250 of Mr. Carter, who was a personal friend of mine, and whose family is on intimate terms with mine. I had previously asked different persons for the money, but at the time the Building Societies were closing, and my other friends were not in a position to make me the advance. I then went to Mr. Carter, and he obliged me with the money.

17210. Did your wife join with you in giving a note of hand? Yes; we gave Mr. Carter a note of hand signed by both of us promising to repay him the £250 in twelve months.

17211. Did you repay the £250? Yes.

17212. With or without interest? Without interest.

17213.

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17213. How did you repay it? In instalments about every two months.
17214. How did you yourself regard the transaction at the time;—did you think of it then in the same way that you do now for instance? Certainly not. I did not consider that I was doing anything wrong whatever. I regarded Mr. Carter as a private gentleman. I was well acquainted with him and his family, and I considered that he made the loan in order to help me and my wife.
17215. I suppose that if you thought you were doing wrong you would not have been likely to hand to Mr. Carter your salary cheques as you did on several occasions? Certainly not. I made no secret whatever of the matter.
17216. Is there anything else you wish to state to the Commission as to the transaction? No, I do not think so.
17217. *Mr. Gummow.*] From whom did you buy the property? From Mr. Reid the present Premier.
17218. In borrowing this money did you first go to Mr. Carter or to other persons? I first asked other persons, but as I explained just now they were not in a position to oblige me with a loan, their money being locked up.
17219. In getting the money from Mr. Carter did you consider that you were getting it from him personally or from the firm? I thought that I was getting it from him personally. I considered that the firm knew nothing at all about the matter.
17220. You repaid some of the money by your salary cheques;—how was the rest paid back? In cash.
17221. Did you repay the whole of the money yourself? Yes, to the best of my belief.
17222. *His Honor.*] How was it that you came to go to Mr. Carter particularly? Mr. Carter and his wife were both personal friends of mine. I had spoken to them not about purchasing this particular property but about changing from our house to a cottage. I was looking out for a place at North Shore, but I could not get anything at the time. At last I came across this place at Marrickville, and under the circumstances I have explained to you I spoke to Mr. Carter about the matter. He said he would see if he could oblige me with the money I required, and he ultimately did so.
17223. You had been living at North Shore? Yes.
17224. And Mr. Carter was living there? Yes, our families were on visiting terms.
17225. And from the fact of your living at North Shore you knew Mr. Carter? Yes.
17226. How long have you been out in the colonies? Sixteen and a half years.
17227. You had been out some time before this transaction occurred then? Yes.
17228. Did you marry out here? Yes.
17229. Your wife was well acquainted with Mrs. Carter? Yes.
17230. After you became married? Yes.
17231. How long were you living at North Shore? Over two years.
17232. During the whole of that time you were neighbours of Mr. Carter's? We were not living very far from them, but a neighbour of ours is a cousin to Mrs. Carter, and it was through them that we became intimate.
17233. Has Mr. Carter any reputation for liberality at North Shore or otherwise;—has he a reputation for instance for lending money? He was known to me to be a liberal man.
17234. And he being a friend of yours you thought he was a likely man to lend you money? I did.
17235. *Mr. Gummow.*] Did your wife not repay some of this money which you borrowed? I do not think so. I think I repaid the whole personally.
17236. Are you quite sure of that? To the best of my belief that is the case.
17237. With regard to your present position, has any action been taken in the matter—that is as to your salary or anything else—since this inquiry was started? Yes. I was informed that my salary had been reduced from £400 to £250.
17238. Have you been to the Public Service Board about it? I did not get a direct notice from the Public Service Board. As far as I can understand, it came from the Department.
17239. Have you been given any reasons at all for this reduction? No reason whatever.
17240. You had not been examined by the Public Service Board in regard to this matter? I had not.
17241. *His Honor.*] When was this reduction made? The first notice I received was on the 28th August. The paymaster then sent me out a pay-slip, asking me to sign for the reduced salary of £250.
17242. With no explanation? No explanation. I asked Mr. Davis for an explanation, and I was told that the Public Service Board had reduced my salary to £250.
17243. Are you still doing the same work? Yes.
17244. Have any other officers who are doing the same work as yourself been similarly reduced? Not that I know of; I do not think so.
17245. Have you made any inquiries with a view to find that out? I did not inquire about that.
17246. You have not heard of such a thing? No.
17247. What did you understand to be the reason for the reduction of salary—do you know of anything? I could not think of anything else but the transaction with Mr. Carter to which I have referred.
17248. That is all you know of or suppose? That is all.
17249. Have you been at any time called up for any breach of duty or for want of care in the performance of your duty? No; I do not think there is anything whatever against me.
17250. What are you by profession? A civil engineer.
17251. A qualified engineer? Yes. I am not registered, having no intention to enter the German Government Service, but I went through the University course.
17252. Consisting, I suppose, of attendance at lectures and going through a certain course of practical work? Yes.

George Anselm Henry Rowney sworn and examined:—

17253. *Mr. Davis.*] What is your position? I am an engineer in the Sewerage Construction Branch.
17254. You had charge of the concrete arches that were turned across the valley at Double Bay, in conjunction with Contract 53? Yes; I was resident engineer on that work.
17255. You saw the arches after they were turned;—you had them under your entire supervision from the time they were turned until they were out of the contractors' hands? Yes.
17256. Did any of those arches collapse? None of the arches in the sewer itself. A culvert under one of them subsided and cracked a little bit.

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17257.

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17257. With that exception did anything happen to the concrete that would lead you or anyone else to say that there was a collapse at that particular spot? No; there was no collapse there at all.
17258. *His Honor.*] Was there any settling of the arches more than they ought to have settled? In the arches of the sewer itself there was no settlement whatever. As regards the culvert, the bottom on one side was soft. The arch settled a little bit, and it was considered advisable to remove it and to construct a new one.
17259. Right through, or only the end of it? Only the end of it.
17260. What was the span of that arch? About 14 feet.
17261. Would that be the same span as the main arches? No; the main arches have a span of 20 feet.
17262. The culvert was under one of the main arches? Yes; it was not the same height as the sewer.
17263. What length of it had to be cut out and renewed? About 10 feet.
17264. *Mr. Parkes.*] How long were you upon No. 53? Two years and a half—while it was in progress.
17265. Do you recollect an inspector named Hamilton being there? Yes.
17266. What was he doing? He was there for about a month in charge of the brickwork.
17267. Only a month? Only a month, I think.
17268. Did he get into any difficulties? I believe he was suspended—I was not there on that particular day—for not looking after his work properly.
17269. In what way? I cannot say. I was not there when he was suspended.
17270. But you have heard of the nature of the work? Yes; I heard that it was for allowing brickwork to go in in an improper manner.
17271. Anything else? No. I could not say anything more definite than that the work was not put in in a proper manner—at all events, in a manner which agreed with his superior's ideas.
17272. Did you not hear something about insufficient cement? I cannot say anything more definite than I have already said.
17273. Was he removed at once? He was suspended during the pleasure of the Engineer-in-Chief.
17274. Do you remember an inspector named Vincent? Yes.
17275. Was he removed? Yes.
17276. What for? I found some inferior packing in one of the tunnels.
17277. How was it inferior? It was not packed tightly.
17278. Was there anything else? No, the material was quite good, but it was loosely packed. Instead of packing a drum which had been turned they proceeded to turn another drum; it would be about 3 feet in length.
17279. Was it not 9 feet? No.
17280. You are sure it was not? Yes.
17281. Was there ever a case on that contract in which 9 feet were found unpacked? No; the packing I have referred to is the only defective packing I found upon my work.
17282. What became of Vincent? He was removed from the contract.
17283. Where to? He was suspended, and virtually dismissed.
17284. Did he get on again? Yes, he was employed again.
17285. How long afterwards? I could not say.
17286. Where is he employed now? At North Shore.
17287. On one of Carter, Gummow, & Co's. contracts? No, on Butcher Brothers' contract.
17288. In connection with the packing to which you have referred;—who was the bricklayer? Reidelberg.
17289. Where is he? I do not know.
17290. Where did he go from this particular contract? I do not know.
17291. Did you recommend his dismissal? I pointed out the facts as I found them; I did not recommend the dismissal of anyone.
17292. Was the man taken away at once? Not for two or three days afterwards.
17293. Was he working there during the two or three days? I believe so.
17294. Who was the contractors' manager on that job? I think Mr. Snodgrass was the principal manager there.
17295. They had no contractors' manager? Not apart from a member of the firm.
17296. *Mr. Davis.*] Was Rogers there at all? He had nothing to do with that part of the work.
17297. *Mr. Parkes.*] Some cement was condemned upon that job? Yes; on several occasions.
17298. Where was it sent to when it was condemned? I could not say.
17299. Was it taken away? Yes.
17300. You are sure of that? Yes.
17301. Did you see it yourself? No; I did not see it myself, but the inspector's instructions are—that, when cement is condemned, it is to be removed.
17302. What was the brand of the cement? I cannot remember it.
17303. Do you keep a note of such things? We have a lot of cement sent out to us, of course, on a job of that kind, and we know whether it is condemned or not.
17304. Was there any book in which you would make a note of the condemned cement and of the brand? It would be among the papers of the contract, I suppose.
17305. Suppose there is no paper among the papers of the contract to that effect;—would there be a book? I do not know that there would be any book.
17306. The note would be among the papers of the contract? Yes.
17307. What would the papers be? There would be a report of the cement tests.
17308. Would there be any other papers? It would be noted upon that paper when the cement was condemned.
17309. Would you get a letter telling you that the cement was condemned? We should get a copy of the cement test, with a notification as to whether the cement was to be used or not.
17310. Would you not get a letter with that? We should be notified by the Engineer-in-Chief whether the cement was to be used.
17311. Do you recollect getting such a letter? We always got the cement test itself, and it is noted upon that whether the cement is to be used or not.
17312. *His Honor.*] In a minute, do you mean? Yes.



17313. I suppose you are aware of the fact that Mr. Bagge has positively sworn more than once that these particular concrete arches, and no others, altogether came to grief—that they were built of rubbish, and that the whole thing had to be rebuilt—what have you to say to that? No such thing occurred.

17314. You say that positively—you are quite sure of it? Yes.

17315. What did occur was the failure just at one end of the culvert? Yes. We had a drawing sent out by Mr. Bagge showing the crown of the arch to be removed and rebuilt.

17316. So you are quite positive that Mr. Bagge must have made some extraordinary mistake? Yes.

17317. *Mr. Parkes.*] You could locate the arch of the culvert on the plan? Yes.

G. A. H.  
Rowney.

14 Sept., 1896.

WEDNESDAY, 16 SEPTEMBER, 1896.

Robert Rowan Purdon Hickson was recalled and further examined:—

17318. *His Honor.*] You wish to make a statement in reference to the witness Rudolph? I desire to explain that with regard to Rudolph a mistake has been made. I made a point of seeing the Public Service Board yesterday with reference to this matter, and the mistake has been rectified. As long as he holds his present position he will be paid at the salary originally allotted to that office, viz., £400 a year.

17319. Then do I understand that the putting of his salary down on the Estimates at £250 was a mistake? Yes.

17320. How did the mistake originate? In this way: His connection with the contractors was brought by me officially before the Minister, and the Minister thought it advisable that he should be put in a position where he would not be brought into contact with the contractors, but that no change should be made until the proceedings of this Commission were over. Had he been put into the position indicated by the Minister the salary attached to that altered position would have been £250. Through some mistake the Civil Service Board understood that that was Rudolph's present position, and they therefore put his salary down at £250.

17321. Then I understand that at present, as far as you know, there is no intention of altering Rudolph's position? There is no intention of making any alteration until the proceedings of this Commission are over. What may be done afterwards I cannot say. I presume it will depend a good deal upon your Honor's report.

17322. Certainly the matter ought to stand over until my report has been presented. No action ought to be taken in the meantime. I had intended to ask for an explanation of what had been done, so that the explanation might appear as evidence in the case, because it has become a matter of public comment that Rudolph has had his salary reduced? The mistake occurred exactly in the way I have explained.

17323. *Mr. Gummow.*] You have said that no action will be taken until after the Commission is over;—if any minute has been made in the matter, would it bear upon Rudolph's case as regards the future? I could not tell you that. It depends upon two things—first of all upon the finding of the Commission, and then upon what view the Minister may afterwards take of Rudolph's action. I cannot, of course, bind the Minister to the extent of saying what would be done.

17324. *His Honor.*] I suppose it would depend ultimately upon the Public Service Board? I suppose it would be a question of obtaining their concurrence to whatever the Minister thought might be the right thing to do.

17325. *Mr. Parkes.*] You did write a minute suggesting that Rudolph should be made an example of, did you not? I wrote a minute to the effect that I thought it advisable that some action should be taken.

17326. To make an example for other officers? I forget the exact wording. It is very probable that was the wording of it.

17327. *His Honor.*] I am very glad that this matter has been settled in such a way that Rudolph will not be in any way affected, because I think you made a mistake in taking any action at all. I will not say anything more about the matter except this—that the Supreme Court would have made very strong comment upon any person, or body of persons, or upon any officer, who had dealt in any way with a witness in relation to evidence given in a case *sub judice*? I looked at the matter in this light—that as adviser to the Minister it is my duty to keep him posted up in everything which takes place in the office or affecting his officers. I merely stated the facts. I did not suggest any reduction of salary. I simply stated the facts as they presented themselves to me.

17328. Before Mr. Parkes begins his cross-examination upon your evidence of the other day, are there any facts you wish to add to that evidence? Yes.

17329. *Mr. Davis.*] Do you know what the practice is, and has been in the past, with regard to advances to contractors on material on the ground, but not in position? There has been no rule laid down about it, but it has been a common thing to make advances both on material and on plant.

17330. It has been the practice not only in this Colony but also in the other Colonies? Yes.

17331. The specification I hand you in connection with one of the South Australian railways is a case in point? Yes; it is the extension of the railway to the Victorian Border—the second section from the Murray to the Border.

17332. Will you state the nature of the provision in that specification as to advances on material? It provides for an advance at the rate of 75 per cent. on such material on the ground as may have been approved by the Engineer-in-Chief as fit and necessary for the work.

17333. You know that in the old specifications, in the Sewerage Branch at least, if not in other branches, provision was made for an advance not only on material but also on the plant? Yes, that is the case.

17334. It has been dropped out of later specifications, but, in respect of material, advances have been made very frequently? Advances have been made on material, and, as I say, they have also been made on plant.

17335. The papers I hand you are in connection with a contract for a training-wall on the Manning River;—was an advance made on plant in that case? An advance of £500 was made in that case on 16th May, 1895, the contractors being Granther & Co.

17336. *His Honor.*] That would be under Mr. Darley? Yes. I find that Mr. Darley signed it. I think the advance was made just about the time of the change.

17337. Here is the contract for a section of the Bondi sewer;—will you tell His Honor what was stipulated to be advanced in that case in respect of material and plant? Payments are made as follows:—90 per cent.

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cent. on the work actually done, performed, and fixed; 70 per cent. on the value of approved material on the ground; and 50 per cent. on the value of such plant as the engineer may approve of as fit and necessary for the work. That is Contract 8.

17338. *Mr. Parkes.*] Whose contract is that? Pritchard's.

17339. What would be the date of that? December, 1883.

17340. *Mr. Davis.*] That is the date of the signing of the bond? Yes.

17341. Here is another contract at the Clarence River? Yes. It was a contract which was let to the firm of Greig and Mondy for breakwater works on the northern side of the Clarence River in 1883. There were considerable advances made in that case. There was an advance made of £504 10s. 5d. on the value of the horses and plant, according to a list attached; and £337 19s., according to another list attached. Then there was an advance of £1,000 for plant, including a locomotive, rock drills, one 10-horse power boiler and pump, and one steam crane, complete.

17342. *His Honor.*] That would be under Mr. Moriarty? Yes; I was the officer-in-charge of northern district at the time.

17343. *Mr. Gummow.*] As to these advances on material—were they made generally to all contractors who wanted them? Yes; it was the usual thing to do. Of course, for works carried out, such as that at Mort's Dock, and in places like that, advances have been made when the material has not been on Government property.

17344. *His Honor.*] A bill of sale being taken? Yes.

17345. *Mr. Gummow.*] In the case of Carson's contract at Arncliffe, was not an advance made before the material came on to the ground—in fact, while it was being shipped from Home? On the ironwork, yes, I think so.

17346. *Mr. Parkes.*] Before it was in the possession of the contractors? Before it was landed here.

17347. The advances you referred to were 75 per cent. upon the whole value—they were not up to the full amount? There is no percentage. They were sewerage contracts.

17348. In former contracts you had not made advances up to the full value of the property? In Granther's case we did.

17349. Before the property was on the site? In Granther's case it was scattered over several miles between the quarry and the training wall.

17350. In respect of a great portion of the cement advanced upon in connection with the North Shore contract, it was on Grant's wharf, was it not? I cannot say from memory; but even if it were so, that would be no reason why it should not be advanced upon.

17351. In regard to the Adelaide matter, the advance was on material only and not upon plant, I understand? It is the common practice with all engineers to advance on plant and material. It is universally done in the old country. In the case to which you refer the advance is on such material on the ground as may be approved by the Engineer-in-Chief.

17352. At what rate? Seventy-five per cent.

17353. With reference to the Monier patent—when you made your minute in the first instance advising the Minister to accept the patent and to pay the contractors 15 per cent., was Mr. Carter at the time in your office? In the first place, I never wrote to the Minister advising him to accept the patent.

17354. You advised him to approve of it, did you not? I asked for his authority to use it where we thought it advisable to do so.

17355. And he gave you authority? Yes.

17356. On one occasion after that you paid £2 15s. for the use of the patent? As far as I know, we had paid nothing for it.

17357. After you had obtained the approval of the Minister you paid a royalty upon the patent in the case of the Callan Park work? Not to my knowledge.

17358. But you know now that the royalty was paid? No, I do not.

17359. Have you not seen the vouchers lately in connection with that matter? No; I do not sign the vouchers, I sign only the abstracts. It is quite likely that there may have been a payment to the extent you speak of.

17360. As a matter of fact you are bound, whenever the patent is used, to pay Carter & Co. 15 per cent. for the use of it? Whenever I use it myself. If I carried out a work by day-labour and used it I should be bound to pay for it. If I were carrying out a work by contract, I presume it would be for the contractor to make arrangements with the patentees.

17361. But the contractor will charge the Government? It is a matter between the contractor and the patentees as to what they will charge. I do not know what the patentees would charge any given contractor.

17362. But would not the Government be bound to pay Carter & Co. a royalty whenever the patent was used? Certainly not, unless I used it myself on a work which I was carrying out by day-labour. If I called for tenders for a work in which this patent was introduced the successful tenderers would have to make arrangements with the patentees. I do not know whether they would have to pay them 15 per cent., 100 per cent., or 1 per cent.

17363. Under the arrangement which you made with them, could the patentees not recover from the Government 15 per cent. in respect of any work of the Government into which the patent was introduced? I do not think so. It is a matter of law, but I do not think that that is the case.

17364. As to Contract 69, in which the item of £50 for bluestone pitchers occurs, did you look over the Schedule before you submitted it to the Board of Reference? It was submitted to me with the usual report. I glanced over it certainly. (*Vide Appendix No. 52*).

17365. But did you look at every item? No; there were something like 4,000 contracts a year going through my hands, and I could not do that.

17366. You did not look at each item in the Schedule? No.

17367. Did you alter the items 73, 74, 75, and 76 in respect of which a mistake was apparently made in putting down pounds for shillings;—is not the alteration in your own handwriting? I have no recollection of making the alteration, but I may have made it.

17368. Is not that your handwriting in the margin of the document I hand you? Yes.

17369. What does it say? "The rates quoted are shillings per cwt., not pounds."

17370. But the totals are right? Yes.

17371. The mistake made was putting in pounds instead of shillings? Yes.

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17372. And you corrected it? Yes.
17373. When did you make that correction? I could not say. It is not dated.
17374. You got the contractors to initial it? They signed it, but I do not remember when it was made. It was probably made after the tender was accepted. It was a clerical error, and, possibly, the correction was made some time during the progress of the work.
17375. *His Honor.*] Is this the original schedule filled in by Carter, Gummow, & Co.? Yes.
17376. Someone has put a query in pencil as regards "tons"; do you know anything about that? I think that was done during the progress of the works.
17377. If it had been "tons" instead of "cwts" the amounts would have been right? Yes; either in the one instance "tons" should have been given or in the other "shillings."
17378. The change from "tons" to "cwts" requires a change from "pounds" to "shillings"? Yes.
17379. *Mr. Parkes.*] You made the correction yourself? Yes; it is in my handwriting.
17380. With reference to your son—who first put him into the department? Mr. Moriarty.
17381. Was it done on your recommendation? No.
17382. How did the affair take place; did your son himself apply for appointment? No; Mr. Moriarty used to pay a visit about every quarter to Newcastle. On those occasions he stopped with me, and in the course of a conversation he asked me what I was going to do with my boys. He said, "You had better send one of them to me and make him an engineer." As a matter of fact, he did not go directly to Mr. Moriarty. He went to a bank for six months and was afterwards taken into the department.
17383. On what day did he enter the department? I should have to look it up. It was about a year before I came to Sydney. I should say, speaking from memory, that it would be about 1887; but I could not say positively. The Blue Book, however, will give you the exact date at once.
17384. When did he leave the department? In 1893.
17385. Did it appear to you that it was a more awkward position for him to take up—that of engineer for contractors who were doing work for the Government—than remaining in the office? In the first place he was taking up a position with contractors in another colony. He was not working for them here at all. Apart from that, however, I certainly was not going to tell him that he must not get employment anywhere.
17386. But in your evidence the other day you said you removed him from the department because you thought it an indelicate thing to keep him there when you were dismissing other officers? That was not my evidence; I removed him because a report to that effect was spread about. I think now that I made a mistake in taking any notice of the report, and that it would have been better to let him remain where he was. It certainly would have been better for him, because had he done so he would have been in a far better position than he is in now, and he would not have been knocked about to the extent he has been in the interval.
17387. But would it not appear to you that he was in a more awkward position, as far as your relationship with contractors was concerned seeing that the firm which he joined were doing a certain quantity of work for the Government, even although your son went to Adelaide? I do not know. It is entirely a matter of opinion.
17388. You had a conversation with the manager of the Bank of New Zealand in Adelaide as to Carter, Gummow, & Co.? Yes.
17389. You knew your son was with Mr. Gummow and with Mr. Gillan there? Yes.
17390. And you knew that Mr. Gillan was then a member of the firm of Carter, Gummow, & Co.? I do not know to this day who the members of the firm are. They are always changing about.
17391. But you asked the manager of the Bank questions with reference to the status of the firm of Carter, Gummow, & Co.? I said I asked questions as to the position of Mr. Gillan.
17392. You knew that Mr. Gillan was a member of the firm? In Adelaide, certainly.
17393. A member of the firm of Carter, Gummow, & Co.? Yes, in an Adelaide contract.
17394. You gave evidence on Monday to the effect that there were officers in your department who held patents? Yes.
17395. But have you allowed those officers to work in conjunction with contractors as partners in those patents to obtain Government contracts? No; I have not allowed that in any case which I am aware of.
17396. Would you allow it? I am afraid I do not quite understand your question.
17397. Would you allow an officer in your department to work in conjunction with contractors to obtain a Government contract when he was a partner with the contractors in a patent? I would not allow any of my officers, if I knew it, to work for contractors.
17398. Or to enjoy a contract in conjunction with contractors with whom he held a patent? I do not quite know what you mean. I do not say that I would debar an officer from holding a patent. For instance, he might be a partner in a patent which might be held by some outsider, whether a firm of contractors or any one else.
17399. You would allow him to work conjointly with those contractors in making out plans and in preparing estimates for tenders for public works? I have just said that I would not.
17400. In reference to the Minister's minute, as to the letting of Contract 79, and your own minute, you said in your evidence that Mr. Lyne's minute was written on the day following your own;—that was an error, was it not? I think it was written on the afternoon of the day on which my own minute was written.
17401. As a matter of fact they were both written on the same day? You will see the dates in the Parliamentary papers. I think I was quoting from them when I gave my evidence.
17402. The minutes were written on the same day? Yes.
17403. Was it before seeing Carter, Gummow, & Co.'s tender for Contract 69 that you decided to alter the system of tendering? The question of altering the system of tendering was under my consideration for a very long time—I think for nearly six months—and the change was made, I think, after the letting of the Marrickville contract.
17404. That was after you saw Carter, Gummow, & Co.'s rigged schedule? Not especially Carter, Gummow, & Co.'s, but the whole of them.
17405. Did it not make any impression upon your mind? Of course it did.
17406. It was the one which made you determine to instantly alter the system? It brought matters to a head.

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17407. Cook and Webb's contract was for an annual supply of ironwork, was it not;—it has been referred to as the first contract let under the new system? I forget which was the first contract. (*Vide Appendix No. 64.*)
17408. Are you not aware that the Treasury has for years past called for all its supplies upon a schedule upon which tenderers have been asked to tender at a percentage above or below given prices, or at par? Yes. The same thing applies to the Works Department.
17409. Then the change of system was not an innovation? Entirely as far as public works themselves are concerned.
17410. But in other departments it has been adopted for perhaps twenty years in connection with annual supplies? It has been done in the Works Department for years so far as annual supplies are concerned.
17411. This contract of Cook and Webb's was a contract for annual supplies, was it not? That I could not say, speaking from memory.
17412. It was for the supply of ironwork for sewerage contracts, was it not? I should have to see the specification before I could say whether it was for an annual supply or not. It does not appear to be very clear from the specification whether it was for an annual supply or not. It appears to be for a definite quantity of material for sewerage contracts.
17413. But, ordinarily, all these contracts for the supply of material are called annually? Ordinarily, that would be so, so far as the supply of material is concerned; but this is a different contract. It is not one of the ordinary contracts for a supply of material.
17414. It is for the supply of ironwork for all contracts, is it not? Yes.
17415. Sometimes you called for the supply of leather and other materials for use on contracts? For use in the department.
17416. Those tenders are called always on a system under which tenderers can tender at a percentage above or below prices or at par? Yes. That has been in force for years. I do not claim any originality in respect of the system itself. The originality lay in the application of the system to public works. That had never been done before. I got the Water and Sewerage Board to take the same course.
17417. They had been doing so before, had they not? Not on sewerage contracts.
17418. But on water contracts? I do not know about those.
17419. Do you not know that, as a matter of fact, the system had been applied by the Water and Sewerage Board to water contracts? I have heard it said that that is so, but I do not know it as a matter of fact.
17420. You say that Mr. Bagge did not point out the unprecedented nature of Messrs. Carter, Gummow, & Co.'s schedules for Contract 69? No.
17421. Did he point out to you, in connection with the schedule of 79, the excess upon the items of blasting? His minute will show you exactly what he did point out. (*Vide Appendix No. 65.*)
17422. He did not have any personal interview with you in reference to the matter? No; the tenders were examined by him quite independently of me, and he wrote his recommendation without seeing me in reference to the matter.
17423. Would he not be likely to call to see you at the time? I cannot call to mind any occasion when he has come to see me in order to explain anything in the schedule which he has not explained in his minute.
17424. But if it happened that he saw something extraordinary in the schedule, would he not come down to see you about it? He ought perhaps to do so, but he did not in this case.
17425. He would not write an ordinary report if anything struck him as being very remarkable, would he? Decidedly; it is his duty to write a report.
17426. Would he not come running down to you at once and say "Here is a nice state of things"? Certainly not; I have too high an opinion of Mr. Bagge to think that he would consult me as to whether he should write a certain minute or not.
17427. But supposing he were very much astonished? Then I suppose he would refer to the matter in his minute.
17428. But would he not be more likely to have an interview with you than to write you a letter? Certainly not.
17429. When you were first engaged to go to Adelaide, did you enter into any definite agreement as to terms? No; I was advised by Sir John Cooke, who nominated me, and who practically appointed me, not to make any engagement with a Colonial Government, because, as he said, it was quite likely that I should not care to remain there, and it would be better to have a free hand.
17430. You came out, then, without making any engagement at all? No engagement whatever, beyond that which is referred to in the letter before the Commission, as to the payment of my passage money.
17431. Upon what date did you go to Adelaide? In March, 1876.
17432. When did you leave? In June, 1880.
17433. Did you make application to the Government of New South Wales for an appointment? No.
17434. How was it that you came here? When I left South Australia, as I pointed out the other day, I was engaged for some little time in Melbourne—I was consulting engineer to the Melbourne Harbour Trust. I then came here on a visit on my way to Queensland. I was thinking at the time of going in for squatting pursuits. I was staying with Mr. Moriarty, and I told him that if I did not see my way to take up a station property, I had made up my mind that I would go Home. He said "Do not be in a hurry to go Home. I shall very likely be soon able to give you a good position here." I waited for a while, and he sent me a telegram offering me a position. I never made any application for it—in fact, I had almost made up my mind at the time that I would go Home.
17435. Did you not protest against the South Australian Government disbanding your department after bringing you from England? I think I did; but it is not of much use protesting against the action of a Colonial Government.
17436. Did you get any testimonial from the South Australian Government? There is a letter I put in the other day. That shows the reason why the department was done away with.
17437. Did you not apply for letters of testimonial from the South Australian Government? No; the letter already before the Commission was quite enough for me.
17438. You never asked the Government for any letters of testimonial? No.
17439. When you landed in South Australia, and took up your work, the first thing which came under your hand was a work in connection with the Rivoli Bay and Kingston jetties? No.
17440. What was the first work? The Victor Harbour breakwater. 17441.

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17441. But you had the work to which I had referred put into your hands six months after you arrived? It was, probably, about that, but I do not remember how soon.

17442. You know the firm of Wells Brothers, do you not? I knew them when I landed in Adelaide, but I never saw them before.

17443. They were the contractors who built the Rivoli Bay and Kingston jetties? Yes.

17444. Did you not know any of the Wellses before you came to the Colony of South Australia? No.

17445. Did you come out with one of them? No.

17446. One of them called upon you soon after you came to the Colony? Yes, I think so. One of the brothers, but I forget which.

17447-8. He introduced to you an agent of Wells Brothers, named Cheesewright, did he not? Yes.

17449. Mr. Cheesewright made the designs upon which Wells Brothers tendered for these works, did he not? He made a second lot of designs. The first lot were made in London.

17450. He made the second lot? I do not know whether he actually made them. He made some alterations on the first lot.

17451. You were cross-examined by Sir John Downer as a witness in the Wells Brothers' arbitration case? Yes. (*Vide Appendix No. 63.*)

17452. In your cross-examination you told him that Mr. Cheesewright made the plans, and that you lent him your office in which to make them—is not that so? Yes; I was instructed by the Minister to give him room in the office to do so.

17453. Mr. Cheesewright, on behalf of Wells Brothers, also made the tracings which were sent to England, and upon which tenders were called? I forget who made the tracings. They were made in the office. Probably Mr. Cheesewright made them.

17454. They were made from Wells Brothers' plans? From copies of Wells Brothers' plans.

17455. The Minister decided that tenders should be called upon the Government plans? Yes. I recommended the Minister to send these plans Home, so that tenders might be invited.

17456. Mr. Cheesewright's plans were sent Home, were they not? Yes; or Wells Brothers. I forget which.

17457. You told Sir John Downer that Mr. Cheesewright's plans were made in such a manner that none of the English contractors could tender upon them? So it turned out.

17458. But were they of such a character that no one but Wells Brothers could tender upon them? That is how it turned out.

17459. In explanation of that you also said that you did not consider it worth while bothering, as you considered that the only contractors who could get the work were Wells Brothers? The contract was practically, and to all intents and purposes, let to them before. They sent out plans in the first instance, and designs or copies of them were sent Home.

17460. No other contractors, you thought, could compete with them? I do not think they could.

17461. Ultimately, when they came to build these jetties, it was found that the piles were not long enough? Yes; the ground line that Mr. Cheesewright made was incorrect.

17462. And they could not build the jetty? Yes; it is built now and in use.

17463. But not the original jetty? Yes.

17464. Is it not a fact that the end had to be taken off and a new end put on? The piles were lengthened.

17465. Was not the jetty so narrow that it could not be used for shipping owing to the weight coming upon it? As far as I know it is just the same width as was originally designed.

17466. Have you seen the evidence given by Mr. Higinbotham before the Public Works Commission in Adelaide after you left? No; I have his report. I do not know whether he gave any evidence.

17467. In reply to Sir John Downer, you told the arbitrators in Wells Brothers' case that you went with Mr. Cheesewright to take the soundings and to go into other particulars? I do not think so. I think Mr. Cheesewright came with me; I happened to be going down.

17468. You recommended that his expenses should be paid for all the work he did? Yes.

17469. But the work he really did, as you admitted, was entirely for Wells Brothers, who were the only contractors who could get the work? The contract was practically let to Wells Brothers before I came to the Colony. I would suggest that Mr. Higinbotham's report should be put in because he explains that matter very fully.

17470. *His Honor.*] You say that the facts as set forth in Mr. Higinbotham's report are correct? Yes.

17471. *Mr. Parkes.*] The drawing, you said, was taken on September 13th, and possibly the first communication was in June—you arrived in June? In April, I think.

17472. From June, when Mr. Cheesewright first approached you, until the 13th September, he was preparing these designs and obtaining other particulars? No; he was carrying out another contract.

17473. Was it not your evidence that he worked at your office? During some of the time he was doing that; but he had another contract under the Government.

17474. What contract was that? The Tippiara Reef Lighthouse.

17475. Sir John Downer asked you whether you knew before Mr. Cheesewright sent in his design that the Government intended to invite tenders in England, and you answered that you could not say that you knew officially, but that practically you did know? I expect so. The thing happened so long ago that I forget the particulars.

17476. You said in answer to a question by Sir John Downer, that you could see that, owing to the incorrectness of the drawings, the piles would stick out from the jetty into the water like needles for most of the way? Yes, some of the piles were too short.

17477. Mr. Downer asked you whether Cheesewright prepared the plans for you, and you said that he prepared them for Mr. George Wells; you were then asked whether they were prepared in the Government office, and you said that he asked you to allow him to use your office, and that you did so;—is that correct? Yes.

17478. Then Sir John Downer asked: "I think you informed the Government that if Mr. Cheesewright had not done the drawings you would have had to employ someone qualified to prepare them; did you report to the Government that, from Mr. Cheesewright's extensive experience in these matters, you considered him the most competent person to supply information in connection with these jetties?" and you said, "Yes, I did; I considered him a very competent man";—is that correct? Yes; he was a competent man.

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17479. Sir John Downer then asked: "I think you reported that if he had not done the work you would have been compelled to get some addition to the present staff, even supposing you could have got it done at all, which you thought was doubtful," and your answer is "Yes"? We had no one in the office who understood screw pile work at all.
17480. Had you not a Mr. John Wright in the office who understood it? Yes; but he could not give his time to it. He was my principal assistant.
17481. Did he not give evidence before the inquiry, and did he not say that he could take soundings, and that he did understand screw piles? Taking soundings and understanding screw piles are two different things; but as a matter of fact Mr. Wright did understand screw piles.
17482. He was your employee? Yes; but in a different district. He was my principal assistant, and he could not give the necessary time to the screw pile work.
17483. Sir John Downer then asked you how long after that it was that the plans were sent Home, and you said, "The plans were sent Home at the end of that year; I could not say from memory exactly when." Is that correct? I have no doubt that if it appears there it is correct.
17484. As a matter of fact, did Mr. Cheesewright make any borings? I do not know.
17485. Did you not admit that you saw him in a boat—that you knew he had been on the site of the Kingston jetty, but that you did not know whether he had been to the site of the Rivoli Bay jetty at all? Yes. I was going down to Kingston to a different work, and I left him at Kingston. Before I left one morning I saw him in a boat taking soundings. What else he did I cannot say.
17486. The original plans, I believe, were lost—I believe they could not be found? I think the originals were lost.
17487. On comparing the tracings with the lithographs it was found that great irregularities had taken place as regards the length of the piles? Yes.
17488. Which were sent Home—the tracings or the lithographs? I really forget now which went Home. I could not say now. Probably the whole lot went Home.
17489. There was another contractor whom you expected to tender, was there not—a Mr. Gibson? Yes.
17490. You knew him when you were in England? Yes; he used to do lots of work for us in England.
17491. His son was in your office? Yes; he was one of our inspectors.
17492. You told the arbitrators at that time that you thought that only Mr. Gibson would be able to tender, and that his son would be able to send him proper information? I forget. If it appears in the report of the proceedings I probably said so.
17493. What was the diameter of the screw piles on which the piers were to be built?  $4\frac{1}{2}$  inches, I think.
17494. What was to be the cost of the two piers? I forget now.
17495. Was it to be about £53,000? I really could not tell you.
17496. Was it not the fact that Wells Brothers tendered for the Rivoli Bay jetty at £23,000, and for the Kingston jetty at £30,000? If those figures are there they are probably correct.
17497. Mr. Tomkinson asked you this question, "Do I understand that Mr. Cheesewright had not been at Rivoli Bay at all?" and you answered, "I do not know whether he went to Rivoli Bay or not"; Sir John Downer then questioned you as to the wrought-iron that you would require? That is very likely.
17498. And it turned out that Sir John Downer had all your office papers; for instance, a memorandum as to the ironwork? Yes; I believe he got hold of them in some way. I forget how that matter was cleared up.
17499. In any case, it was found out that Wells Brothers were in possession of your office papers? Yes.
17500. How was the difficulty overcome with reference to these jetties? The arbitrators overcame it by not giving the contractors anything at all.
17501. And then the contractors threw up their contract? Yes, I believe they did.
17502. What ultimately took place? I think we finished the works ourselves.
17503. The Government finished them? Yes.
17504. And in finishing the works they altered the design entirely? Not to my knowledge.
17505. They had no remedy against the contractors? No. Of course the contractors were in the wrong.
17506. Did the Government seek to recover anything from the contractors? No.
17507. But they completed the works themselves? Yes; but I do not think they were completed in my time.
17508. They were completed after your time? Yes; I do not think they were finished when I left.
17509. Do you know whether, since you left, the light  $4\frac{1}{2}$ -inch piles have been injured by corrosion? I do not think it is at all likely. There is a lighthouse quite close to the jetties, erected a long time before the jetties were thought of, upon wrought-iron piles, and that, as far as I know, has not been affected. I know the light is still used; I have frequently seen it in passing.
17510. Did not any Minister of the Crown call upon you to explain your connection with Wells Brothers or with Mr. Cheesewright? No, certainly not.
17511. No Minister of the Crown? No; there was never any question about it.
17512. Of course, when a man is making a plan in a public office for a contractor, as against Government plans, he would naturally do his work in the interests of the contractor, would he not? I do not know how he could do so.
17513. Supposing the man were an agent for contractors, would he not make the plan to the interests of the contractors rather than to the interests of the State? I presume he would make the plan correctly.
17514. What do you mean by that? Just what I say—that he would make it correctly.
17515. But supposing he were the paid agent of the contractors, would he not study the contractors' interest rather than the interests of the State? There are only two ways of making a plan—making it wrong, or making it right. I presume the plan would be made right.
17516. Supposing he were making a plan in a case where there was no chance of competition from other contractors, would he not make it to the interest of the contractors who were paying him. How could he alter the facts of the level of the ground, the high-water mark, or the size of the piles? I do not understand what you mean.
17517. What would be the object of the contractors in making a plan? To have a plan upon which they could work, I suppose.
17518. And would not the contractors' agent, in making the plan, make it to the contractors' interest? You can only make a plan right or wrong. There is no question of making it to the contractors' interest or against the contractors' interest.

17519. But you must know, as a professional man, that plans can be so manipulated by a contractor's agent? I have not yet learnt that branch of engineering.

17520. But this was an experience of the kind, was it not? Not in the direction of manipulating plans.

17521. Did you not, in reply to Sir John Downer's questions, and when you were throwing the blame on to Mr. Cheesewright, say that he made the plans in such a manner that no other contractors but Wells Brothers could tender? He made plans which were shown afterwards to be incorrect, and if they were incorrect in the first instance, it would be difficult for another firm to tender.

17522. The object of Mr. Cheesewright in sending incorrect plans to England was to prevent other persons from competing with his employers? I should be very sorry to make such an insinuation in connection with Mr. Cheesewright.

17523. Were not Wells Brothers defeated upon the arbitration proceedings upon that plea—that Mr. Cheesewright had used his position to prevent competition from other contractors? I do not think so.

17524. Was not that the only reason;—did you not throw all the responsibility upon Mr. Cheesewright? For making plans. The contractors wanted to make the department responsible, but I said they were not responsible—that the plans were the plans of the contractors, and that they must be responsible for them whether they were right or wrong.

17525. Did you not point out that Mr. Cheesewright had made plans so that Wells Brothers would be the only tenderers? I did not put it in that way. I said that he had made the plans himself, and that he was entirely responsible for them, whether they were right or wrong.

17526. Did you sign the plans? Yes.

17527. As the Government engineer? Yes.

17528. *His Honor.*] Did you sign the plans to verify or to identify them? To identify them.

17529. *Mr. Parkes.*] As Government documents? As the plans for the work.

17530. *His Honor.*] To be tendered on? Yes.

17531. *Mr. Parkes.*] Did you sign the plans which went to England as Engineer for Harbours and Jetties? Yes.

17532. Where is Mr. Cheesewright? I have not the least idea.

17533. Is he in Adelaide now? I do not think so. I believe he is dead. He went to China. I know that he carried out some lighthouses in China. I have not seen him for years.

17534. Did you know him before you met him in South Australia? No.

17535. With regard to the Largs Bay works, did Wells Brothers carry those out? No.

17536. What were those works—there was a breakwater, was there not? No works were carried out in my time at all at Largs Bay.

17537. But Wells Brothers sent in a plan and specification, and a tender was prepared by Mr. Cheesewright? When I came to South Australia, Wells Brothers had the run of the whole engineering office. They sent in plans for all sorts of things, but the only ones that I had to deal with were for the Rivoli Bay and Kingston jetties. They sent in plans for lighthouses, which were erected upon their design and without any competition. I know they sent in a plan for the Largs Bay jetty, but it was not carried out in my time. Some work has been constructed there since, but I do not know who did it.

17538. Did not Mr. Wright take soundings and borings for these jetties? He took them, I think, before I came to the colony. I think so, but I am not quite sure. He was in South Australia long before I came. He was handed over by the Railway Construction Branch to me as one of my officers. I really do not know when he took the borings.

17539. There was a Mr. Notcutt, who, according to the evidence, understood screw piling? I speak subject to correction, but I think not.

17540. He took bores, did he not? I think not; Mr. Wright was the only one who took bores, as far as I can remember.

17541. Was it proposed that these jetties should carry a railway? No; they were to carry trucks.

17542. Still an engine would have to run across them? No; certainly not.

17543. Did you not put up some steam cranes on some part of these works? No.

17544. On some other works then? I have put up a lot of steam cranes in my time.

17545. Did you not put up some steam cranes at Port Adelaide or at Port Pirie? Some steam cranes were put up in the dockyard at Port Adelaide. I think there were some steam cranes put up also at Port Pirie, Morgan, and Goolwa.

17546. Were they from designs prepared by Mr. Cheesewright? No; they were not. I do not think he ever sent in a design for a crane.

17547. The steam derricks you put up did not work;—considerable alterations had to be made to them at Port Adelaide? No.

17548. Did you put up any at Port Adelaide? In the dockyard, but not on the wharfs.

17549. Those you put up would not work? Certainly they would.

17550. When the Rivoli Bay and Kingston jetties were subjected to the testing load it was found that they would not bear it? Not that I know of. As a matter of fact they did bear it, I think.

17551. Mr. Higinbotham said in his evidence before the Commission:—"The Treasurer wished me particularly to inquire into the connection of Mr. Hickson, the Engineer of Harbours and Jetties, with the designs for these two works." That is Mr. Higinbotham's evidence on 25th September, 1879. Did you have any communication with the Treasurer on the subject? No; not that I can remember.

17552. Mr. Higinbotham appears to have made inquiries as to how far the Engineer of Harbours and Jetties—that would be yourself—was responsible for the design, and he said "I confess I do not altogether approve of the course he pursued in the matter. I find that Mr. Hickson on his arrival here found the designs prepared, and that Messrs. Wells Brothers had given an estimate of the cost of construction." Those were the first designs, were they not? The first and second were both the same. The second designs were practically the same as the first.

17553. Mr. Higinbotham says in giving the same evidence:—"The decision of the arbitrators was entirely in favour of the Government. Subsequently on communication with the Marine Board it was determined to reduce the length of the jetty, and Mr. Hickson proposes to use the material saved in the lengths to double their previous widths, for a length of 450 feet from the end of each jetty towards the shore." The jetties appear from that evidence to have been reduced from 4,000 feet in length down to 450 feet, and to have been doubled in width? You are reading that evidence quite wrongly. They were reduced in length by 450 feet; they were not reduced to 450 feet. (*Vide Appendix No. 63.*) 17554.

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17554. But they were widened for the whole of their length? Only for that 450 feet which was taken off the end of the 4,000 and put on to the end of the shortened length. The outer end was widened to the extent of that 450 feet.

17555. *Mr. Smith.*] That was upon your recommendation? Yes.

17556. *Mr. Parkes.*] Mr. Higinbotham was asked what was his opinion with regard to the design, and he said, "I think the design was too light with only 15 feet width at the end, which was at first proposed. I think it would be very likely that the end might be carried away in rough weather." He was then asked whether he did not object to iron, and whether he would not prefer jarrah, and he said that he would prefer jarrah? So would I, and I used it afterwards in all wharfs and jetties.

17557. Did you not send in a report to the Treasurer, upon the motion of some Member for papers, in which you said that you recommended iron, because you considered iron the proper thing to use? Cast-iron, not wrought iron.

17558. The material of which you constructed the jetties was questioned by Members of Parliament? Members of Parliament question all sorts of things. I do not remember there being any special question in that case.

17559. Do you not recollect sending in a report with regard to the iron? I do not remember it, but I might be able to identify it if you would show it to me.

*His Honor said the question before the Commission was not as to Mr. Hickson's ability. Even supposing, in the instance referred to by Mr. Parkes, he had recommended the very worst material, and in doing so had made a mistake, this Commission had nothing whatever to do with that.*

*Mr. Parkes said he understood that His Honor wished to limit the branch of the inquiry relating to South Australian matters as far as possible to a parallel case to that of the adoption of the Monier design in Contract 77. That being so, he would ask His Honor to admit as Appendices the evidence which had been given by Mr. Hickson before the arbitrators in the case of Wells Brothers, the evidence of Mr. Higinbotham before the Royal Commission upon Public Works, and also Mr. Higinbotham's report.*

*His Honor said that if there were no objection on the part of Mr. Hickson to the admission of the papers, or a portion of the papers, referred to by Mr. Parkes, they might be put in for what they were worth.*

*Mr. Hickson said he had no objection to the whole of the papers referred to by Mr. Parkes appearing either in the body of the evidence or as Appendices, whichever might be thought best. Perhaps he had better explain the facts. A question had been raised in South Australia as to a cargo of rails which was sent to the Railway Construction Branch in connection with the Port Augusta railway. It was a question as to whether the rails had been properly or improperly passed, and Mr. Higinbotham, who was then Engineer-in-Chief for Railways for Victoria, was asked to come to the Colony to report on the question. While Mr. Higinbotham was in the Colony, rumours got abroad—as they sometimes would when one thing was supposed to be wrong—that the whole of the public works carried out in the Colony had something wrong in connection with them, and he suggested to his Minister that as Mr. Higinbotham was in the Colony, he being a well-known engineer, he should be asked to report upon all the works he had undertaken; and the Colonial Treasurer of the day, Mr. Mann, who happened to be his Minister, approved of Mr. Higinbotham's making a report. It appeared from the papers that on the day after he presented his report he gave the evidence before the Royal Commission which had been referred to by Mr. Parkes.*

*His Honor said that since Mr. Hickson raised no objection to the admission of the papers, he would direct that they be printed as Appendices to the evidence. (Vide Appendix No. 63.)*

17560. *Mr. Parkes.*] Did you construct the Wallaroo jetty? No; I think it was constructed after I left.

17561. Was it started by you? I do not think it was. I should have to refresh my memory upon that point. It was intended to be started, I think; but the site chosen by the Marine Board was considered a bad one, and, as far as I can remember, the work upon the altered site was not commenced until after I had left.

17562. The following paragraph appears in the report of Mr. Mann, the Secretary to the Public Works Department:—"The charge of the important works which are connected with the improvement of our harbours and the construction of piers to render our coasts available for shipping has been placed in the hands of the Engineer-in-Chief. A few years ago it was considered advisable, by way of experiment, to create a department of Harbours and Jetties, and to appoint an engineer to take the exclusive charge of the construction of those works in conjunction with the direction of the dredging operations, which were carried on by the Marine Board. The change, however, did not work as satisfactorily as had been expected. The Government resolved, therefore, to abolish the new department, and to revert to the arrangement in existence before the Harbours and Jetties Department was created. Harbour works, lighthouses, and jetties, will therefore in future be constructed under the superintendence of the Chief Engineer, and the dredging under the direction of the Marine Board. The change was effected towards the close of the financial year." The same report says, in reference to the Wallaroo jetty: "Some difficulties have been met with in connection with this undertaking. The original contract entered into in August, 1879, was set aside, and a fresh one entered into for a structure on a site alleged to be more suitable than the one that had been chosen. After the work had proceeded to some extent it was found that the soundings taken were incorrect. A fresh site was therefore selected. The work which had been executed was abandoned, and a new agreement made with the same contractor for building a jetty on a fresh design on a new site." That was your work, was it not? No; that alteration was made after I left the Colony.

17563. But the original work was your work? Yes.

17564. Did Mr. Cheesewright design it? No.

17565. Were not Wells Brothers the contractors? No; I think Grant was the name of the contractor.

17566. Do you recollect that the soundings were found to be so incorrect that the work had to be abandoned? I have already explained that the site was found to be a wrong one. It was chosen by the Marine Board, and it had to be altered.

17567. Would you not have to take the soundings? One of my officers took the soundings.

17568. The report says that the soundings were found to be incorrect? I think the soundings for the later work were taken by the Marine Board's own officer.

17569.



17569. Did not the Minister in charge ask you to explain how it was that the soundings were incorrectly taken? I do not think so. There may be some papers which will explain the matter.

17570. *Mr. Smith.*] I find that I misled you the other day in asking you question 17117;—I refer to my question as to the date upon which Mr. Lyne, the Minister, wrote the minute referred to. I asked you whether he did not write it on the next day? Yes; I see that is an error. He wrote the minute on the same day.

17571. As to Mr. Gillan, I think you said that all you knew was that he was a partner in that particular contract which the firm had with the South Australian Government? Yes; of course, I only knew that from hearsay.

17572. You did not know that he was a member of the firm in any other sense? I knew he was not a member of the firm in regard to Contract 77.

17573. All you knew was that he was a partner in the South Australian contract? Yes.

17574. *Mr. Gummow.*] With regard to Mr. Gillan, do you know in the Department that he is, or ever has been, a member of the firm of Carter, Gummow & Co., in any of their contracts in New South Wales? I should have to look up all the contract documents to answer that question.

17575. With regard to Mr. Forrest, the paper upon page 272 of the Parliamentary return shows that Mr. Forrest was a partner of Carter & Co. in respect of Contract 72? It shows that, in respect of Contract 72, the firm consisted of Messrs. Carter, Snodgrass, and Forrest.

17576. Does it show that Mr. Forrest was a member of the firm in respect to Contract 79? The document to which you refer says: "And whereas the said contractors and the said George Forrest in carrying out the said contract made a claim for extra works in connection therewith, amounting in all to the sum of £4,050 9s. 6d., &c." It would appear that Mr. Forrest was not a contractor for 79, but that he was a contractor for 72.

17577. Does that support the position you took up in saying that you only know the contractors by the names of the partners given in their tender forms? Yes.

17578. So that, as far as George Forrest is concerned, can you show that he was a partner of Carter & Co. or Carter, Gummow, & Co. since that date? No. All that I can accept is the names which appear at the foot of the tenders. I do not know anyone else in the matter.

17579. The names of the partners put beside the name of the firm? Yes.

17580. Can you show whether Mr. Forrest has been a partner of the firm of Carter & Co. or Carter, Gummow, and Co. up to April, 1895? I should have to look through all the tender forms before I could answer that question.

17581. But you do not know that he was? No.

17582. Nor Mr. Gillan? No.

17583. You said that the Department of which you had charge in Adelaide was done away with, and that the whole of the works were put under one head? Yes.

17584. Do you know if they are all under one head now? Yes.

17585. The arrangement has not been altered since you left? No.

17586. There is one engineer-in-chief there for all the works? Yes.

17587. *Mr. Parkes.*] Are you aware that Mr. Forrest has been the contractor managing Contract 77, and that he has been supervising it since its commencement? I cannot say that I am officially aware of it. I have never been in charge of that contract.

17588. But you know, as a matter of fact, that Mr. Forrest is supervising it? I have been out to the contract twice as a visitor, and I have seen Mr. Forrest there, but what position he holds with regard to it I cannot say. There is no reason why he should not be manager on that contract as far as I can see.

William Julius Baltzer sworn and examined:—

17589. *Mr. Gummow.*] What are you? I am an engineer.

17590. You are an employee of Messrs. Carter, Gummow, & Co.? Yes.

17591. What were you doing before you came into their employ? I was in the Government service.

17592. For how long? I joined the service first in September, 1884, and I left of my own accord in March, 1889. I re-entered the service in December, 1889, and I was retrenched in October, 1895.

17593. For what reason were you retrenched? A Commission had been appointed and the whole of the service was reorganised.

17594. You were given notice that you would have to go? Yes; I received 6 months' notice.

17595. Did the Department give you the option of doing any other work? They gave me the option of having my salary reduced or leaving the service, and I said I would rather leave the service.

17596. You took your 6 months' leave and compensation? Yes.

17597. Have you any testimonials from the Department? I have testimonials from Mr. Bennett, Mr. Bagge, and Mr. Hickson. I have not copies with me now, but I could produce them.

17598. What salary were you receiving? £335.

17599. What were your duties? I was directly in charge of a certain number of draftsmen under Mr. Bagge.

17600. How long have you been in the employ of Carter, Gummow, & Co.? Since August or September, 1895.

17601. When you were in the Department, do you remember receiving a notice to get out a design upon the Monier system? Yes.

17602. What were the reasons for doing that? Mr. Bagge told me to get out a design upon the Monier system.

17603. But for what reason? He did not give me any reason. He only told me to get out a design.

17604. Were any other designs got out at the same time? There were two other designs.

17605. The design upon the Monier system was done under your supervision? Yes.

17606. Were you able to calculate all the necessary details in connection with it? Yes; I was able to calculate everything.

17607. Did you ever speak to Mr. Hickson about the system? I told Mr. Hickson at the time the patent was taken out that I had taken it out.

17608. Did you tell him that you were going to take it out? No; that I had taken it out.

17609.

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- W. J. Baltzer. 17609. You did not tell him of it before you took it out? No.
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17611. You have lately been to Germany? Yes.
17612. With what object did you go there? I went firstly to see my relations, whom I had not seen for fourteen years. In the second place I went to inquire into a system of desiccating, also as to the Monier system and other work which might be advantageously carried out in the Colony.
17613. Did you get any information upon these matters in Germany? Yes.
17614. How did the information which you received at home agree with that which you already had with regard to the Monier system? I had most of the particulars in my hands before I left.
17615. Did you consider, after seeing what you did in Europe, that you were in a position to make a design upon the Monier system before you left? Yes.
17616. Do you think that the arch in the case of Contract 77 would have tumbled down if it had not had the iron grill in it? No.
17617. For what reason would it stand up? Because the line of the pressure-curve falls within the middle third. Under any circumstances; if even the sewer were running brim full.
17618. Could you calculate it? Yes.
17619. Mr. Bagge, in his evidence, said that you had no key to the calculation;—what have you to say as to that? I had everything necessary for calculation in connection with the structure.
17620. With regard to the cement used in the Colony, do you know to what test it is subjected? Yes. I was looking at the German conditions and comparing them with the conditions in use in the Public Works Department in this Colony, and I find that they are practically the same.
17621. Do contractors in Europe get special cement for structures upon the Monier system? No. They use the ordinary cement furnished by the factories.
17622. Do you know how long the factories have been in existence in Germany? The first factory was erected in 1855 at Stettin.
17623. Was a union formed by the cement companies? In 1877 they formed a union to protect themselves. That was done of their own accord.
17624. Did they then send their cement to Berlin to have it tested? No. Germany consists of a great number of States, and each State governs itself with the exception of one or two Imperial matters, for instance, defence, postal arrangements, and railways.
17625. While you were at home did you go into the question of what securities the departments held over the contractors or patentees in connection with these works? In Austria the contractors for the first bridge ever built upon the system there had to leave a deposit of 10 per cent. upon the cost of the structure for one year, and to maintain the structure for another two years.
17626. *His Honor.*] Maintenance for three years altogether? Yes.
17627. *Mr. Gummow.*] Is that the general rule with reference to structures which are in course of erection on the continent of Europe now? I should think so. I should imagine that the Monier Company, being the same in Austria as in Germany, would certainly object to more stringent conditions in Germany.
17628. The one firm hold the patent for the two countries? The company holds the patent for Austria and the southern parts of Germany.
17629. Is it M. Monier himself who holds the patent? No; it is held by a company.
17630. You got your information upon these points from Wayss & Co.? Yes.
17631. Do you consider that you are a specialist in this matter? Yes.
17632. With reference to the use of the Monier arch, did you see any buildings upon that system while you were at home? I saw one built at Gersheim in Germany, and also one at Vienna.
17633. Was that structure in one arch? At Gersheim there were three arches, and at Vienna one arch.
17634. In what way were they constructing the three arches;—were they building the whole of the three at one time? No, they built one arch on each day.
17635. They did not build the three arches all in one day? No.
17636. So that the building of the whole of the arches in the structure on the same day or continuously is not considered necessary by the Monier Company? Not at all.
17637. As to leaving the centres in;—how long are they left in in Europe? From four to six weeks according to the thickness of the structure.
17638. While the centres are in is there any thrust on the piers? No thrust whatsoever.
17639. In the Monier system at home are there any expansion joints? None at all.
17640. Have you read Mr. Bagge's report upon the three systems of construction? No; I do not remember it.
17641. In one paragraph of his report he says:—"In order to meet this difficulty the radius of the 75-ft. span arch of scheme No. 3 had to be so selected that the centre-line of forces should always keep within the middle third of the arch ring";—did you calculate it out when making your design, and keep the line of resistance within the middle third? Yes. Mr. Kern did so at the time.
17642. Are you satisfied that Mr. Kern's calculations are correct? Yes, perfectly satisfied.
17643. Did you check them? Yes; afterwards.
17644. Have you any sketch showing those calculations? Not in connection with that particular contract.
17645. Have you any in connection with the Monier system at all? Yes.
17646. Upon what system have you made your calculations? In the office it was done on Schieffler's theory. I worked them out upon the theory of the elastic arch.
17647. And how did they compare? Very favourably.
17648. Mr. Bagge, in his evidence, in answer to question 706, says: "Well, I was just saying that we tried to make a calculation, and could not do so";—is that correct? To a certain extent. I was in charge of a certain number of draftsmen, and was unable to leave my work. I could not neglect other work in order to do everything that was necessary in connection with this design. Another officer had therefore to take the calculations in hand, and he, not knowing anything of the theory of the elastic arch, had to resort to the common theory of the Voussoir arch.
17649. Mr. Bagge, in reply to His Honor, at question 1756, said, referring to the German Government: "They simply say, 'If you are going to adopt this patent in such and such a work, you must put down

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75 per cent. of the value in cash securities. After the work has stood one year 50 per cent. of the contract money will be paid you; after it has stood for the second year another 25 per cent. will be paid you; after it has stood for the third year you will get the balance of your security." You will see from that that the State thinks there is some risk in the system;"—is that correct? I never heard of such a thing.

17650. Did you ever take into consideration the question of climate in Australia as compared with Europe? Yes; I consider that the climate here is much more favourable to the structure than is the European climate.

17651. In reply to question 3464, Mr. Bagge said: "This patent was taken out without my knowledge. I had no idea at the time that it had been taken out; but Mr. Hickson knew of it;"—is that correct? Mr. Hickson knew of it only after the patent had been taken out.

17651½. Is the system used generally in structures on the Continent? It is used very largely in building construction for floors, roofs, columns, cess-pits, water-tanks, bridges—in fact, in any structure in which formerly bricks or concrete have been used.

17652. You have some photographs illustrative of the use of the system? Yes.

17653. Where did you obtain those photographs? When I was on the continent of Europe recently.

17654. Had you any information on the subject before then? Yes; I wrote a treatise upon the Monier patent.

17655. When you were in Europe, did you hear of any structures likely to be built upon this system on a large scale? Yes; they were building a bridge in Austria with a span of 40 metres, or about 120 feet.

17656. Did they propose building a still larger structure than that? Yes; there was a scheme for a railway-bridge with a span of 120 metres, or 350 feet.

17657. *His Honor.*] A single span? Yes.

17658. *Mr. Gummow.*] You have heard of the Monier culvert which was built at Strathfield? Yes.

17659. Did you see the building? Yes; both during the construction and afterwards.

17660. Have you seen it during the last few months? No.

17661. How long is it since you saw it? It must be at least eighteen months.

17662. Was it in good order when you saw it? In splendid order.

17663. Did you ever hear that it had collapsed? No.

17664. As to Mr. Bagge, how did he always look upon the Monier system while you were in the office? He was always prejudiced against it, and latterly I never talked to him on the subject. I mentioned the matter to him at the commencement, and he snubbed me in such a way then that I thought it better to leave the thing alone.

17665. That was while you were in the office? Yes.

17666. Was that before the Monier arch which was designed in the office was done? A good time before that.

17667. As to other work, what sort of man was Mr. Bagge;—did he believe in keeping to old systems, or in going in for new ideas? When I told him about this system he told me that it was better to stick to old ideas, instead of trying to introduce fancy-work.

17668. Did you ever have any argument with him on the subject of introducing other ideas, quite independently of the Monier system? I often had arguments with him. If I wanted to make an alteration in a shaft, for instance, in a new contract, Mr. Bagge always objected. There was a great deal of difficulty in inducing him to consent to any alteration whatever.

17669. Did you explain to Mr. Bagge what you knew about the Monier system when you found him prejudiced, as you term it? I never talked to him beyond that, except when he himself brought the subject up.

17670. Did you give him all the information you had in your possession? No.

17671. Since you have been in the Colony, have you ever heard of any failure in the system at Home? No.

17672. While you were in the department you say you got out a Monier design for Mr. Bagge's report? Yes.

17673. Is the plan produced the design you prepared? Yes.

17674. For his report? No, not for his report. That was for Contract 77.

17675. Did you do that in the office? No.

17676. Where did you make it? At home.

17677. Is that your original drawing? Yes; those are my figures.

17678. Is that a drawing or a lithograph? It is my original drawing.

17679. And you are sure you did that at home? Yes.

17680. During your own hours or during office-hours? During my own hours.

17681. It was you who originally took out this patent in New South Wales? Yes.

17682. How long ago? I could not tell you, but I think it was in 1891 or 1892.

17683. You took in with you two partners? Yes; Mr. Carter and Mr. Snodgrass.

17684. What made you take them in with you? Because they were special friends of mine.

17685. Was that your only object? I knew them a long time, and while we were talking, sometimes on engineering matters, the subject cropped up.

17686. Who paid the necessary expenses? Mr. Carter.

17687. You did not pay anything? No.

17688. In taking in Mr. Carter and Mr. Snodgrass, did you consider that it would be of benefit to the working of the patent in the future? Decidedly.

17689. Did they pay you anything for joining in with you, you having all the information? No.

17690. Did you ever receive any money from them while you were in the department? No.

17691. Have you ever received any money from them or from anyone else for patent rights? No.

17692. While you were in the office, did you give any information to contractors of office business? No.

17693. With regard to the tests which had been made of this system;—have you seen any tests at all? Yes; I was present at the test made by Mr. Carter, at North Shore, and also at another test, which was made at Forest Lodge. Mr. Roberts also made some tests.

17694. Did you ever test any blocks for compression? Yes.

17695. The blocks were made of different kinds of sand? Yes.

17696. Did you assist to make those blocks? Yes.

- W. J. Baltzer. 17697. With regard to the watertightness of the system—do you consider that Contract No. 77 will be watertight? Perfectly watertight.
- 16 Sept., 1896. 17698. Do the photographs you have produced show any work upon this system constructed to hold water? Yes. There is an aqueduct among them—also reservoirs.
17699. At question 1752 Mr. Bagge, in paragraph 3 of the report which he read, says, “The patentees at Home are specialists; have a special staff of specially-trained workmen of many years’ experience in constructing models on the Monier system before they undertook the construction of models on this system;”—what have you to say as to that? If a person wishes to carry out this work he must certainly know the whole theory of construction; but he does not want special workmen. He wants very careful conscientious workmen who will carry out the work under his instructions. The work has to be carried out very carefully, but no expert workmen are actually required.
17700. As to the man in charge? The man in charge must understand the whole details of the system.
17701. In paragraph 6 of the same report, Mr. Bagge says, “Mr. Baltzer was not a specialist, and had extremely little, if any, practical experience of work, having, so to say, just left the University in Germany—in fact, what he knew of engineering he learnt from me in the Sewerage Office;”—is that correct? No.
17702. *His Honor.*] In what respect is it incorrect? I did not learn anything from him. I always studied a great deal at home.
17703. *Mr. Gummow.*] Did you study in the evening while you were in the department? Yes. I often made sketches of work upon different contracts at home. The sketches I now produce are some of them. They are in connection with some work which was done in 1891. They were made in my own time, at home.
17704. These are your own drawings? Yes; done in my own time.
17705. In taking Mr. Carter and Mr. Snodgrass in with you, as far as this patent is concerned, did you do so in order that they might assist you in designing, or was it their practical experience of work that you wanted? I took them in on the ground of their practical experience.
17706. In reply to question 7163 Mr. Bagge says, “Well, I know for a fact that the cement used for such work at home is not procurable in these Colonies for love or money;”—is that correct—cannot the cement be procured? Certainly it can be procured. The German manufacturers are only allowed to manufacture cement of a certain standard. If it does not come up to that standard their names are excluded from the Association, and they are published in the German newspapers, which would mean ruin to the manufacturer.
17707. Do you know if their cement comes out here? I ascertained the kinds of cement in use at home, and I found that the Germania and Henmoor brands are well-known cements on the Continent.
17708. Are those the cements which are being used by Messrs. Carter, Gummow, & Co. upon Contract 77? Yes.
17709. *His Honor.*] Is it the fact that in calculating the strength of these arches you ignored the grill, and that you calculated upon the assumption that they would stand without utilising the effect of the grill in them? Yes.
17710. As if they were compo. arches? Yes.
17711. That is to say that, resolving all your perpendicular strains into the line of the arch, you would find the compressive strength of the arch enough to resist them? Yes.
17712. So that the arch, in point of fact, does not act in any sense necessarily as a girder? Quite so.
17713. But, at the same time, if it were required to act as a girder it would do so on account of the grill? Yes.
17714. You did not require to assume an unequal load;—you assumed an equal load throughout? Yes.
17715. So that you wanted only the single grill? Only the single grill.
17716. And you say that the arches would in point of fact stand without it? Yes.
17717. That is the calculation you made? Yes.
17718. But you would not build such a structure without the grill, because the calculation would be rather too fine? Yes.
17719. *Mr. Gummow.*] What about the question of elasticity? That is shown in the test arch at Puckersdorf before it collapsed; it bent considerably.
17720. The grill is necessary to elasticity? It makes the structure much more elastic.
17721. *His Honor.*] In putting the expansion joints into the carrier over the piers you consider that there is enough elasticity in the rest of the structure, it being so open, to compensate without cracking for the utilisation of the expansion? Yes. If the arch should shift itself the greatest strain would be in the carrier over the pier.
17722. The carrier would probably alter its own form to a certain extent with the same increase of temperature that would tend to raise the arches? Yes.

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FRIDAY, 18 SEPTEMBER, 1896.

George Christie recalled and further examined :—

- G. Christie. 17723. *Mr. Parkes.*] You have looked through the inspector’s journal in connection with Contract 72, and you have also looked through a list of the purchases made by Carter, Gummow, & Co. in respect of the same contract;—I believe you have also taken out of the journals of 53 a list of the cement which was transferred to that contract from Contract 72? I should explain that the journal in the case of Contract 72 has not been found. The extracts are not from that journal.

17724.

17724. Your extracts are taken from the journals of Contracts 53 and 79? Yes; I have prepared the following statement:—

G. Christie.

18 Sept., 1896.

List of Cement purchased and delivered at Contract 72, from 1st September, 1891, to 23rd June, 1892.

| Date.      | Vendor.                                    | Quantity. | Brand.     | Tested prior to 19 Nov., 1891. |
|------------|--|-----------|------------|--------------------------------|
| 1891.      |  | Casks.    |            |                                |
| October 2  | Parbury, Henty, & Co.                      | 597       | Camel      | No. 584, 6/10/91.              |
| " 8        | Henry Austin                               | 376       | Germania   | " 595, 14/10/91.               |
| " 12       | Parbury, Henty, & Co.                      | 396       | Wouldham   | " 596, 15/10/91.               |
| " 30       | Gibbs, Bright, & Co.                       | 252       | Gostling's |                                |
| November 6 | Henry Austin                               | 300       | Alsen's    | " 609, 11/11/91.               |
| " 13       | Parbury, Henty, & Co.                      | 1,000     | Camel      |                                |
| " 13       | Henry Austin                               | 407       | Germania   |                                |
| 1892.      |  |           |            |                                |
| April 30   | "  | 967       | "          |                                |
| May 7      | "  | 994       | "          |                                |
| " 23       | "  | 184       | "          |                                |
| June 23    | Burns, Philp, & Co., 118 less returned 109 | 9         | Elephant   |                                |

The following is a list of entries from the journal of Contract 53 relating to the cement transferred from Contract 72:—

STATEMENT of transfers of cement from Contract 72 to Contract 53, as per entries in journal for Contract 53.

|         |           |          |           |
|---------|-----------|----------|-----------|
| 23/5/92 | 10 casks. | 27/9/92  | 58 casks. |
| 1/7/92  | 24 "      | 18/10/92 | 19 "      |
| 6/7/92  | 5 "       | 26/10/92 | 24 "      |
| 16/7/92 | 3 "       | 3/11/92  | 12 "      |
| 6/8/92  | 5 "       | 4/11/92  | 12 "      |
| 19/9/92 | 12 "      |          |           |
| 21/9/92 | 24 "      |          | 208 "     |

The following statement has been prepared by me, showing the cement used on Contract 72 from the 15th February, 1892, until its completion:—

CEMENT used on Contract 72 from 15th February, 1892, till its completion; date of final certificate being 29/12/92.

|  |        |       |
|--|--------|-------|
| Stock on Contract, 15/2/92   | casks. | 1,300 |
| Subsequent Purchases—  |        |       |
| Per Hy. Austin's invoices—   |        |       |
| 30/4/92—Germania   | 967    |       |
| 7/5/92—"   | 994    |       |
| 23/5/92—"  | 184    |       |
| Per Burns, Philp, & Co.'s invoices—  |        |       |
| 23/6/92—Elephant   | 118    |       |
| Less returned  | 109    |       |
|  | 9      |       |
|  | 2,154  |       |
|  | 3,454  |       |
| Deduct—Removals to Contract No. 53, as per statement of extracts from journal, Contract 53 | 208    |       |
|  | 3,246  |       |

Memo.—The quantity estimated by Messrs. McCreddie and Thompson as required was 3,432 casks.

I have also a memorandum extracted from the journal of Contract 79. The entry appears upon page 70 of the journal of Contract 79, and is as follows:—

EXTRACT from Journal of Contract No. 79.

Mr. Boys, 15/5/93,—

Cement carted and transferred to Contract 90, Neutral Bay, 10 bbls., making a total of 130 bbls., 99 of which were not advanced on by the Department. The rest forwarded by consent.

William Julius Baltzer recalled and further examined:—

17725. Mr. Gummow.] You have your testimonials with you this morning? Yes. The following is from Mr. Bennett:—

W. J. Baltzer.

18 Sept., 1896.

I HAVE much pleasure in stating that Mr. W. Baltzer has been employed during the last four years and three months in the Sewerage Department as a draftsman, during which time I have found him very useful in drawing out detail plans of the sewerage works. He is a neat, intelligent, draftsman, and as such has given general satisfaction. I bear willing testimony to his being an industrious, steady, well-behaved, young man, who gives promise of success in his profession should he choose to follow it up. He leaves the Department entirely of his own accord.

The following is from Mr. Baggé:—

11 January, 1889.

Mr. W. Baltzer having been employed as an engineering draftsman in the Construction office of the Sewerage Department during the last four years and three months, chiefly under my charge, I willingly testify to his industry, intelligence, and steadiness, in all work entrusted to him; and taking into consideration the intricate nature of these works, with all its difficult details, and that Mr. Baltzer had gradually mastered the work, so as to enable him to execute designs of details in a very creditable manner, his leaving the Department, although entirely on his own accord, is a loss to me, which I much regret.

The following is from Mr. Hickson:—

3 May, 1895.

Mr. William Baltzer has for over ten years been employed in the drawing office of the Sewerage Construction Branch of this Department, and has directly designed many of the larger works carried out by the Branch. He has proved himself a resourceful and capable officer, and his architectural knowledge has been of great service.

I greatly regret that the necessity for retrenchment should deprive the Department of his services, and can confidently recommend him for a leading position in any drawing office.

17726.

- W. J. Baltzer. 17726. How long have you been in communication with the patentees of the Monier system in Austria and Germany? Since 1892.
- 8 Sept., 1896. 17727. As to the Monier arches upon Contract 77—do you consider that it will be possible to build those arches more economically in the future? Certainly.
17728. In what way? The Monier Company in Europe allow a strain per square inch of from 560 to 660 lb., and in this particular construction only 300 lb. was allowed. At the same time the iron has taken a great deal of the compression out. The coefficient of elasticity between the cement and the iron is as 1 to 40, so that in the event of the contraction working equally the iron would take up 40 times the strain of the cement mortar.
17729. Do you consider that the whole of the carrier is watertight? Yes, certainly. It has been proved by experiments in England that porous concrete can be made perfectly watertight by rendering it with 1 to 1 compo., or rendering it with pure cement to a thickness of one-tenth of an inch.
17730. What sand and stone material do they use in Europe in connection with this system—do they use pure sand? No, they use pebbles and broken stone up to the size of half an inch; but it all depends upon the size of the construction.
17731. With regard to oxidation, from any information which you have obtained, or from your own knowledge, do you consider that there is any risk of oxidation of the iron? Professor Bauschinger has made a number of tests, and he considers that the iron is perfectly protected by the cement mortar as soon as the mortar has set.
17732. You produce a plan showing the tests made in Austria in 1891 and 1892? Yes. It shows the position of the pressure-curve for a load of 78·5 tons.
17733. *Mr. Parkes.*] In the cases of fracture shown on that plan is the iron fractured in any case? Not in any case. That is the most wonderful part of the experiments.
17734. How do you account for that;—is it drawn at the junctions? It is deformed, but in no case has it been actually torn asunder.
17735. Is it drawn at the intersections? Not even at the intersections.
17736. What happened, then? Only the longitudinal bars were deformed. The transverse bars were not interfered with.
17737. *His Honor.*] The compression of the compo. making up for the deformity, I suppose? Yes.
17738. *Mr. Parkes.*] On the 3rd April, 1893, Mr. Armstrong, the agent for Messrs. Carter & Co., sent to the Secretary for Public Works the following letter:—
- I HAVE the honor to direct your attention to a patent, No. 4,084, issued on 3rd November, 1892, to Messrs. Carter, Snodgrass, and Baltzer, for the purpose of strengthening, and at the same time cheapening, the construction of sewer and other arches as described in such patent as “invention of improvements” in concrete, cement, and mortar, building, and other constructions and manufactures.
- I am desired by my clients to state that they are willing to dispose of their sole powers and rights granted in such patent, and to offer the same to your department for the sum of £1,500.
- You knew of that letter, did you not? I knew of it.
17739. Did you give instructions to Mr. Armstrong? I had nothing to do with Mr. Armstrong.
17740. It was only Carter & Co. who had to do with Mr. Armstrong? I do not know how the matter was arranged.
17741. You recollect the letter coming to the department? I heard of it.
17742. What was to be your interest in the patent;—had you an equal interest in the profits with Messrs. Carter and Snodgrass? Yes.
17743. Have you still that interest? It has been altered to a certain extent.
17744. In what manner? I receive  $2\frac{1}{2}$  per cent. upon the profits which are actually obtained upon contracts.
17745. While you were in the office you were to receive a third share of the profits? Yes.
17746. You said in your evidence the other day that Mr. Hickson had given you permission to take out this patent? I said I told Mr. Hickson after the patent had been taken out that I had done so.
17747. And he did not object to it? No.
17748. After Mr. Hickson had written asking whether Mr. Bagge knew anything about the patent, do you know whether Mr. Bagge then came to you? He did not come to me.
17749. He wrote a report concerning it on the 7th April, 1893, in which he pointed out that it required very careful construction, and in which he gave a general description of it;—did he get that information from you? I do not think so.
17750. Did he speak to you at all about it at that time? I had given Mr. Bagge information before.
17751. Before April, 1893? Yes.
17752. Did you tell him that you had this patent? Yes; he knew about it.
17753. *His Honor.*] Was it before you took the patent out, or after you had taken it out, that you first had a conversation with Mr. Bagge about it? I could not say whether it was before or after.
17754. *Mr. Parkes.*] When the estimates were being prepared for Contract 112, did you not make out an estimate for the Monier system;—that was your work, was it not? I had nothing whatever to do with the estimates.
17755. Did you make the drawings? Yes.
17756. Who made the estimates? Mr. Adams, I should think.
17757. You made out the drawings for Contract 77 upon the Monier system? Yes, at home.
17758. Did you show them to Mr. Hickson at any time? No, never.
17759. Did you ask Mr. Hickson whether you could make them out? No; I never asked anybody.
17760. When were they first given to Mr. Hickson? As far as I can remember, they were submitted with the contract.
17761. They were not shown to Mr. Hickson before that? Not as far as I know.
17762. Would the plans be put into the tender-box with the tender? I do not know. The only thing I heard was that Mr. Bagge, after the tenders had been sent in, showed the plans to different officers.
17763. What did he do that for? I do not know. That was his business.
17764. Did he make any comment upon it? I could not say. He never talked to me about it.
17765. You have put in a letter of recommendation or testimonial from Mr. Bagge? That was written in 1889. I could have got a letter at any time.

W. J. Baltzer.  
18 Sept., 1896.

17766. Did you make out an estimate for the Monier work to arrive at the sum of £15,500, the amount of Carter, Gummow, & Co.'s tender? No. I had nothing to do with that.
17767. You did not make out that estimate at all? No.
17768. Do you know who did make it out? I think Mr. Gummow made it out.
17769. Did he not speak to you about the prices he was putting in for the work? He may have done so, but I knew very little about the prices which were ruling outside. I could not form an opinion as to whether his prices would be correct or not.
17770. Did Mr. Hickson, after the tender had been submitted for the Monier system, speak to you about it at all? No, never.
17771. Did Mr. Hickson know at the time the tender was sent in that you were interested in the patent? Yes; he knew that.
17772. But he never spoke to you at all about it? Never.
17773. He never asked you whether or not you were still concerned in the patent? No.
17774. When you left the Department you paid into the banking account of Carter, Gummow, & Co. the sum of £175, your retiring allowance;—why did you pay that into their account? Mr. Carter was a personal friend of mine. I was leaving the country, and I thought the best thing I could do was to leave the matter in his hands.
17775. It was put into his hands nearly nine months before you left the country, was it not? No; the money was paid three or four weeks after I had left the Colony. That can be proved, I think, by the date on which I left.
17776. Your retiring allowance was not paid until some time after you had left the Colony? No.
17777. And that is why it appears as having been paid into their account at that time? Yes.
17778. You drew a salary from Carter, Gummow, & Co., from the time you left the Department? About four or five weeks after I left the Department I think I was engaged by them.
17779. What salary were they to give you? £250 a year.
17780. You were to be of assistance to them in connection with the Monier patent, or what was the arrangement? I had to do anything that came to hand.
17781. Do you know whether Mr. Hickson saw your drawings at all before they were submitted with the tender for Contract 77? I do not think so. To the best of my recollection the drawings were only handed over to Mr. Carter a day or two before the putting in of the tender.
17782. Only a day or two before? I cannot remember the exact date, but I know the time was very limited.
17783. Were any drawings made before that? That I do not know. There may have been two drawings.
17784. When you were making the drawings for the Monier arch, did you have any of the departmental drawings with you from which to obtain measurements or any data? No; I had everything necessary in my possession. I had made the thing before.
17785. What do mean when you say that you had made it before? I connection with Contract 112.
17786. When you designed the plans for 112? Yes. There were only the dimensions of the arches and of the little spandril arches to be considered in the matter.
17787. Were the plans for No. 77 made at the time that the plans for No. 112 were made? I could not tell you exactly. I think they were made afterwards. I think the plans for 112 were made before the tenders for 77 were actually called for. I think they were just about finished a month before the tenders were called for.
17788. When the drawings for No. 112 were made, was it the intention of Messrs. Carter & Co. to submit a Monier plan in that case? No.
17789. Did Carter & Co. tender for No. 112? I could not tell you.
17790. Why was not the Monier system tested in the case of 112? A design was made by the Department, and Mr. Bagge reported against it. He would not have it.
17791. I think you said that Mr. Bagge instructed you to make that design? Yes.
17792. Did he say that anyone had instructed him? He did not say; he merely instructed me. He did not give me any reasons. I think he said at the time that Mr. Hickson wanted a design.
17793. Would it not be strange under these circumstances for Mr. Bagge afterwards to report against the design, and to stop the work from being built upon that system? I do not think so.
17794. Not if he had given you instructions to make the design and the design turned out to be the cheapest? Three schemes were got out, and one had to be selected.
17795. But the Monier scheme was the cheapest, was it not? I could not tell you.
17796. As a matter of fact, Mr. Bagge says in his report that the Monier scheme would cost £6 6s. 8d. per foot; that No. 2 scheme would cost £6 16s. 11d. per foot—that being the scheme adopted—and the first scheme £9 11s. 5d. per foot, Ahearn's work costing £10 16s. 1d. per foot;—when he came to you to ask you to make the design did he not say anything as to the reasons why he was opposed to the Monier system? He often said before that it was of no use to make plans upon such a system, because it was impossible to carry out the work except by experts.
17797. Did he say that on this particular occasion? I could not say whether he said so on that occasion.
17798. Did he make any excuse for coming to you and asking you to make a design? No; he merely told me to make it.
17799. Why did he come to you? I suppose he knew that I knew something about the system.
17800. Did he say that to you? He did not say it to me; but he knew that I had considerable information on the subject.
17801. Did he make any remark to the effect that as you knew the system, and were well acquainted with it, you would be the best man to carry out the design, or anything to that effect? He may have said that.
17802. Did he say that Mr. Hickson had sent him to you? No; he said, as far as I can remember, that Mr. Hickson wanted different designs got out, and he told me to get out the Monier design.
17803. Did you make any reply to him? No; I set to work at once and got out the design.
17804. Did you not reply to him when he made this observation to you;—did you not make any remark to him? I do not think so.
17805. You do not recollect making any remark? I cannot say that I do.
17806. Do you know whether Carter, Gummow, & Co. had any promise as to the acceptance of the  
Monier



- W. J. Baltzer. Monier design before they sent in their tender for Contract 77? No; they never consulted me at all or spoke to me about any promise.
- 18 Sept., 1896. 17807. When you made the plan, did you think that they were going to get the work? When I first started upon the design I was acting mostly upon my own responsibility. I wanted to see how the thing would actually look.
17808. In that situation? Yes.
17809. *His Honor.*] You mean for Contract 77? Yes.
17810. *Mr. Parkes.*] Did you not know that the design was going to be used in connection with Carter, Gummow, & Co.'s tender? I did not know what the intention was at all, but I thought it not unlikely some use would be made of the design. What the intention was at the time I did not know.
17811. You told Mr. Carter, I suppose, that you were making the design? Yes.
17812. What did he say? Nothing in particular. He said, "All right; let us have a look at it."
17813. When did he ask for possession of it? That I could not tell you. Now I come to think of it, he did not ask for possession of it at all; I gave it to them.
17814. *His Honor.*] You mean us to understand that you made the design out on your own account? Yes; I told them of it at the time, and when it was finished I handed it over to them.
17815. You showed it to them as a good idea as applied to Contract 77? Yes.
17816. You thought it a good idea as applied to Contract 77, as it suited the features? Yes.
17817. *Mr. Parkes.*] When did you first hear that the plans had been handed in with the firm's tender? That I could not tell you exactly.
17818. Did you hear it before or after the tenders were opened? It might have been mentioned to me, but I could not say when.
17819. When you were retrenched from the Service did you not make some remonstrance? No; but I asked Mr. Hickson to be allowed to be examined before the Commission.
17820. What did he say? He asked whether I had any grievance to submit to them, and I said "No."
17821. Can you recollect roughly how many months before the tenders were sent in for Contract 77 you made the plan which was adopted? I cannot.
17822. Would it be six months? I cannot tell you the date.
17823. Was the design made soon after the plans for No. 112 were drawn? I do not actually recollect when the plans for No. 112 were made. It was made after that, no doubt. It is a difficult thing for me to recollect a matter which occurred two years ago.
17824. Contract 112 was let in February, 1895;—when did you leave the office—do you recollect? I left about May, I think.
17825. How long before you left the office were the plans for Contract 77 made out—I mean the Monier design? I could not tell you. It would be very difficult for me to tell you when the plans for 112 were first made, because sometimes contracts lay in the office for a considerable number of months. It would be very difficult for anyone to recollect exactly when the plans were made. Plans might be in the office six months before tenders were called for.
17826. You cannot recollect how long it was before you left the office when you made this particular plan? No.
17827. You could not say within months? No; there would be nothing to remind me of it. It was made at about the time tenders were called for Contract 77. That is all I can say.
17828. Have you received anything up to date in the shape of your partnership percentage in connection with the Monier work? Not a penny.
17829. No money has yet been paid you? No.
17830. You have received irregular sums from Carter, Gummow, and Co.;—in one case, I think you received £60? I have drawn money from the firm as I required it. I think I drew that £60 on the 1st January, to square accounts.
17831. On one occasion you drew £546, did you not? That was when I was at home.
17832. What was that for? That was for information with which the Monier Company supplied us.
17833. Did you pay them that amount for the information with which they supplied you? Yes.
17834. Was the whole of the amount used for that purpose? It was all used for that purpose.
17835. When you offered the Monier patent to the Government for £1,500, did not Mr. Hickson question you about it? No.
17836. He never said a word to you? No.
17837. Although he knew that you held the patent? Yes.
17838. What has been the greatest span of Monier arch work which you have seen actually used at home? About 40 feet.
17839. That is the greatest span you have seen? Yes.
17840. The photographs you have exhibited are of bridges of comparatively small span? A bridge with a span of 128 feet has been erected in Switzerland, and there are a great many with spans of 60 and 80 feet.
17841. You have not seen the bridge with the 128 feet span? No.
17842. Is that the greatest span you know of? Up to the present.
17843. Has it been standing well? Yes. I do not recollect the exact year in which it was erected, but it must have been standing fully six years.
17844. What is the oldest tests which have been applied to this system? I could not say exactly how many years; but this system came into use in Germany and Austria in 1886.
17845. Had they begun to build bridges at that time? I do not think they started at once to use it for bridges. It was used in the building trade in connection with floors and roofs.
17846. You cannot say when the first bridge was built? The first proper test as regards a bridge was made in 1889 at Matzleindorf.
17847. Would frost or snow affect the cement at all? No.
17848. Frost does not affect cement, does it? No.
17849. *His Honor.*] When there is elasticity enough to make up for contraction? Yes.
17850. If there were no scope for elasticity at all, of course it would be bound to go somewhere? Yes.
17851. *Mr. Parkes.*] Have you noticed whether any fractures have occurred in any of the works which you have seen? I did not notice any.
17852. I suppose you could have seen where the fractures had occurred had there been any shrinkage? Yes; I should have noticed it.
- 17853.

17853. *His Honor.*] Do I understand that, when you made the substituted plans for Contract 77, you had it in your mind that there would be some chance of their being used for that contract instead of the office plans? Yes. I suppose it was partly in my mind. W. J. Baltzer.  
18 Sept., 1896.

17854. How came you to think so;—how came you to think that there would be a chance of getting them in substitution for the departmental plans? I was greatly interested in finding out actually how the design would look in comparison with the office design.

17855. It was rather a troublesome work making out these plans;—it took a good deal of time? Yes.

17856. So that you must have had some idea in your mind that there was a fair chance of their being used? I thought there was a fair chance of it.

17857. What foundation had you for supposing that there would be a fair chance of getting the Monier design substituted for the departmental design? I thought we should be able to make a much cheaper design as compared with the office design.

17858. You knew that tenders were to be called upon the departmental design? Yes.

17859. Had you any reason to suppose or to hope that after the Department had made out this elaborate design, and had called for tenders upon it, there would still be a chance of getting it to accept an altogether different design? I could not exactly say. The only thing I thought was that the design would be considerably cheaper if the Monier system were used. My idea was that the cost of construction would be considerably cheapened.

17860. That is, you thought that the plans you were drawing would, when the quantities came to be taken out, show a much lower cost of construction than would the departmental plans prepared for Contract 77? Yes.

17861. You are aware that the lump sum tender was only £200 below the tender for the departmental design? Yes.

17862. That is not very much of a cheapening? The difference is not very great.

17863. It is hardly worth talking about it;—it is hardly worth considering in a sum of £15,000? I thought that if the Department would accept the design it would be a valuable experiment in construction, and that it would be of considerable use afterwards.

17864. You say that you could, in point of fact, having regard to what the arches had to bear, safely reduce your dimensions very much more? Yes.

17865. But in this case you took the large dimensions;—you worked out practically the same large dimensions which you worked out in the case of 112? Yes.

17866. A little larger? A little larger. I thought that everyone being accustomed to the heavier design it would have been inadvisable to submit a design of smaller dimensions, although we might know from our calculations that it would stand.

17867. You thought public sentiment would be against you? Yes.

17868. Not to say prejudice? And prejudice too.

17869. But knowing as you did that Mr. Bagge had set his face against the use of the Monier system in the case of Contract 112, and that he had a very strong opinion as to the risk of using it at all, did you not think there was a very small chance of getting the Department to accept your design in the case of Contract 77? I thought there was perhaps a small chance, but at the same time I thought it was worth trying.

17870. You thought it worth your while to have a shot at it? Yes.

17871. Had you received any information from anyone, which induced you to think that after all, in spite of Mr. Bagge's objection to the Monier system, there would still be a good chance of getting the Department to accept the substituted plan? No.

17872. Not from anyone? No.

17873. You know enough of English to know what getting the tip means? Yes.

17874. Had you not got the tip from anyone? No; as I informed you on Wednesday, I used to make designs at home. I think I made some designs in connection with Contract 77 as far back as 1891.

17875. In the proper sense, but not in the improper sense, of the word, you were a designing man? Yes.

17876. Will you tell me what led to your first thinking matters out in connection with the Monier system—I mean your first having it suggested to your mind that you would take out a patent? I used to take considerable pains in finding out everything I could about the system, and, having gone to the trouble of finding out everything I could, I thought I had a right to take out a patent.

17877. How did you first of all come to hear of it? From my brother at Home.

17878. In what capacity is he employed? I have several brothers. One is a teacher; the others are contractors and architects.

17879. Your family is in the engineering line? Yes; one of my relations is a Professor at the Technical School at Berlin.

17880. Is that the one who is teaching? No.

17881. You have another brother who is teaching? Yes.

17882. Is he teaching mathematics? No; zoology.

17883. So having seen the matter referred to in the papers, and having heard a good deal about the Monier system, it produced an effect upon your mind? Yes.

17884. And you thought it worth looking up? Yes.

17885. And you did then read it up? Yes. In 1892 I received a letter from the Monier Company, in which they offered me every information which would be of use in any works which were being constructed in this Colony.

17886. And then you thought of taking out the patent some time afterwards? I forget when it was taken out.

17887. Who suggested the idea to you? I thought of it myself.

17888. How did you come to go to Messrs. Carter and Snodgrass? Mr. Carter had been for a great many years a personal friend, and I therefore approached him on the subject.

17889. He had money and experience in material? Yes.

17890. You had not experience in material? No.

17891. And you thought that it would be a good plan to go to Mr. Carter or to some one like him whom you could trust—is that so? Yes.

17892. *Mr. Gummow.*] Are you an enthusiast over this Monier system? Yes.

17893.

- W. J. Baltzer.  
18 Sept., 1896.
17893. You have been for a number of years? Yes. I have occupied considerable time in collecting information. The book to which I referred on Wednesday took me a great deal of time to compile.
17894. In speaking to Carter & Co. upon the subject, did you not tell them that the system would be much cheaper than the present method of carrying out works? Yes.
17895. You always considered that it would be much cheaper? Yes.
17896. Did you consider that it could be advantageously employed in general structures in this Colony? Yes; I thought there would be a great saving from its use in many structures.
17897. That is what you had in your mind in submitting to them the design for Contract 77? Yes.
17898. You thought it would be cheaper than the Departmental design? Yes.
17899. Did you know what the estimate would turn out to be as regards either the Departmental or the Monier design—did you know what the prices would be? No; Mr. Bagge did all that kind of work.
17900. Did you know what prices Carter & Co. were going to put into their tender? I do not know now whether I ever saw the prices. Perhaps they were shown to me; but I cannot recollect at this moment.
17901. You considered, when you were getting out your drawing for the Monier system, that it would be much cheaper than the Departmental design,—is it not so? Yes.
17902. As to your drawing, you said that that was made out after the drawings for Contract 112? I said I did not quite know at what time it was made out, whether it was after Contract 112 or not.
17903. Do you know where I was living early last year? In Adelaide, I think.
17904. Do you remember my coming up here? Yes, I remember your being here one day.
17905. Before the tender for Contract 77 was sent in? Yes.
17906. Do you remember when you handed in the substituted plan to the firm? I know that at the time we had a conversation on the subject. I remember that I showed you the plans and calculations, and that you were perfectly satisfied.
17907. Do you remember whether the plan was ready for use even one day before it was put in, or whether you had not to work at it on the very day before the tender went in? I know that it was not ready a great many days before the tender went in.
17908. Do you know whether it was ready one day before? I could not say. I worked at it every night to get it finished.
17909. As to the submitting of the plan, you did not know that we were going to submit it even the day before? No; I did not know anything about it. I think I only heard of it after the tender had gone in.
17910. As to your going to Europe, what information did you want from the Monier Company? I went home in order to save expense in connection with experiments.
17911. You thought it would be possible to get all the information you required from the Monier Company? It had certainly taken me some years to collect the information we already had.
17912. Are you an enthusiast over things apart from the Monier patent? Yes; I had a good many things in hand.
17913. Which you are still working at and getting information upon? Yes.
17914. You submit them to the firm at times? Yes.
17915. As to this amount of £179, your retiring allowance, do you remember when you left Sydney to go to Europe? On 3rd March.
17916. Had the £179 been paid to you at that time? It was not ready at the Treasury. Some few days before I left I saw Mr. Kirkpatrick with Mr. Carter, and he told me at the time that the question had been raised as to who should pay the money—whether it should be paid by the Government or from the Superannuation Fund. He said at the time that the money might not be ready for a month or six weeks.
17917. At any rate, it was not in your possession at the time you left? No.
17918. You gave an order to Mr. Carter to draw it from the Treasury? Yes.
17919. And that is how it comes to be paid to Carter & Co.'s credit? Yes.

James Gillan sworn and examined:—

- J. Gillan  
18 Sept., 1896.
17920. *Mr. Gummow.*] What are you? I am a contractor.
17921. Where have you been residing during the last four years? In South Australia.
17922. When did you return to this Colony from South Australia? I landed here on the 14th of this month.
17923. When did you finish your work there? On about the 12th.
17924. During the four years you were in South Australia how many times were you in Sydney? Once.
17925. What did you come up for? To sign a bond.
17926. Did anyone come up with you? Yes; my wife.
17927. Did Mr. Hickson, junior, come up with you? No.
17928. Was he in Sydney at the time you were here? No.
17929. You said you came up to sign a bond;—in connection with what contract was it? No. 77—the Monier contract.
17930. What member of the firm did you meet here? Mr. Carter.
17931. Did you go with him to sign the bond? Yes.
17932. Did you fill in the bond? Yes.
17933. Did you read it through? Yes.
17934. And you were satisfied, on signing it, that you were worth £6,000? Yes.
17935. You have also made a declaration to the effect that you were worth that amount—is that correct? Yes, as far as I know.
17936. While you were in Sydney at that time you met Mr. Maddison and Mr. Ewing, did you not? Yes.
17937. How often? About twice.
17938. Do you remember any conversation at all with them? No.
17939. Did you have lunch with them? Yes.
17940. Then you must have had some conversation? We were talking about the works in general—as to how we were getting on in Adelaide—and one thing and another of that kind.
17941. Did you mention anything to Mr. Maddison about a partnership with young Mr. Hickson? No.
17942. Did you tell Mr. Maddison that you had seen a certain telegram from Carter to myself? No.
- 17943.

17943. Have you ever seen such a telegram upon the subject of young Mr. Hickson's partnership with the firm? No. J. Gillan.  
18 Sept., 1896.
17944. You are sure of that? Certain.
17945. You met young Mr. Hickson in Adelaide? Yes.
17946. When did you first hear of his coming to Adelaide, or anything about his being employed by the firm? I could not exactly tell you the date.
17947. Do you remember anything in connection with it? I remember your letting me know that he was coming up to assist you to look after the alignment and levels of the tunnels.
17948. Did I tell you that he was going to be a partner in the firm? No.
17949. I did not show you any telegram on the subject? No.
17950. With regard to the firm of Carter & Co., of New South Wales, have you ever been a partner in the firm in their contracts with the Government of this Colony? No; not in New South Wales.
17951. But you have been a partner of the firm in their contracts in South Australia? Yes.
17952. You signed plans and specifications in South Australia? Yes.
17953. Did you ever sign any here? No.
17954. *Mr. Parkes.*] When you opened a banking account in Adelaide did you transfer to that account £5,000 from the Sydney office? I could not tell you. I leave those matters to Mr. Gummow.
17955. Do you not know as a matter of fact that £5,000 was transferred? I could not tell you.
17956. Do you know that a banking account was opened there for the firm? Yes.
17957. There was no banking account there in connection with the firm before that particular account was opened? No.
17958. Is it not a fact that the moneys of Carter, Gummow, & Co. have been transferred back to Sydney now that the Adelaide contract is completed? It might be so for anything I know.
17959. But would it not be so? I do not know anything about it; I leave all such matters, as I tell you, to Mr. Gummow.
17960. Have you not an interest to the extent of £3,000 odd in the business of Carter, Gummow, & Co.? Yes.
17961. Is not that £3,000 distributed all over their business? I suppose so.
17962. Have you not, as a matter of fact, an interest in such profits as may arise from Contract 77? I expect so.
17963. But if there is a profit will you not ask for your share? Certainly, if there is any profit to be got.
17964. As to Messrs. Maddison and Ewing where did you say you met them? I met them for the first time at the Métropole.
17965. When you signed the bond for Contract 77, did you not then know that you would have an interest in any profit which might result from that contract? Certainly.
17966. Did you ever meet Messrs. Maddison and Ewing near the Post Office? No; I did not.
17967. Did you never say to Mr. Maddison or to Mr. Ewing "If I could do so, I should take my money out of the firm and leave it with you two fellows"? No.
17968. Did you not tell them that you had £1,000, but that you did not like to put it into Carter & Co.'s business? No.
17969. Did you not speak to them about their leaving that firm? Their leaving the firm was mentioned, and I remember telling them that I thought they had made a mistake.
17970. You are sure you never said a word to them about young Mr. Hickson coming over to Adelaide? Not to my recollection.
17971. You are sure you never said to one of them, or to both of them, that you had seen a telegram from Mr. Carter saying that it would be necessary to take young Mr. Hickson into the firm? Yes; I am sure of that.
17972. You are quite positive on that point? Yes.
17973. Absolutely certain? Yes.
17974. Did you have any conversation with them as to young Mr. Hickson at all? The subject may have been brought up, but I do not remember any conversation to that effect.
17975. Did you never say to them that he was of very little use as an engineer? No, I did not.
17976. Did you never speak to them at all as to his going to Adelaide, and as to his connection with the firm? I may have mentioned the matter in a communication—by letter.
17977. The original firm, when it built the reservoir at Potts' Hill, were Messrs. Gummow, Gillan, Ewing, and Canty? Yes.
17978. That was the old firm? Yes.
17979. You kept books in those days? That I could not say.
17980. Have you kept books in Adelaide? I have kept the time-book for the men.
17981. But not a ledger or a day-book? No.
17982. Each partner in the firm receives a salary of £43 a month? Yes.
17983. Where did you receive your £43 from? From S.A.
17984. Were there no profits arising from the business at all? That I could not tell you.
17985. How were the profits allotted? I leave those matters to Mr. Gummow.
17986. Was the whole thing done through the Bank-books? I think so.
17987. The Bank-books in the case of your Adelaide account are not like your Sydney Bank-books. The cheques are paid by number? Yes.
17988. How could you tell then what cheques you had paid away, to whom the cheques were paid;—how could anyone tell? I suppose I could tell by making inquiry at the Bank. It was the Bank who altered the Bank-books. I remember Mr. Gummow asking me if I had made the alteration, and I said, "No."
17989. The Bank you say made that alteration? Yes; Mr. Gummow asked me how the Bank-books came to be made up in that way.
17990. Who drew the cheques? I drew them while I was in Adelaide by myself.
17991. Did you draw them by numbers or in the names of the payees? I drew them in the names of the payees.
17992. And not by numbers? No.
17993. Then how came the Bank to enter the cheques up by numbers? I do not know.
17994. How would you know whether you got a fair share of the profits, or whether the business was properly

- J. Gillan.  
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- properly managed if you had no book from which you could see the income and expenditure? I trust Mr. Carter and Mr. Gummow.
17995. Absolutely? Yes.
17996. Have you seen Mr. Maddison or Mr. Ewing lately? Not since I came over.
17997. When did you come over? I landed here on Tuesday.
17998. When you came over to sign the bond for Contract 77 did you see Mr. Hickson? I did not.
17999. Do you know Mr. Hickson? I know him by sight; that is all.
18000. Have you ever spoken to him? Not to my recollection.
18001. Did you not see him in Adelaide? No.
18002. Did he not come to see you to ask you how his son was getting on? No; I never saw him there.
18003. You have never spoken to him in your life? I do not recollect doing so.
18004. Who were present when you signed the bond for Contract 77? Mr. Norrie and Mr. Carter.
18005. Anybody else? There was someone else there, but I could not say who it was.
18006. Have you a property at Marrickville called "Blinkbonnie"? No.
18007. Have you any property in New South Wales? No.
18008. Did you ever possess a property called "Blinkbonnie"? No.
18009. When did you last see Mr. Maddison and Mr. Ewing? I could not tell you the exact date; but I think it would be at the latter end of May, 1895.
18010. Did you ever write to them before this inquiry took place? Yes; we corresponded—before they drew out of the firm.
18011. Have you had any correspondence with them since then? No.
18012. Do you know that I made a statement in the Legislative Assembly upon their responsibility to the effect that you had told them that a telegram had been sent to Adelaide to the effect that Mr. Hickson's son must be taken into the firm at any cost? No.
18013. Did you not see a copy of the *Hansard* containing that statement? No.
18014. Did Mr. Gummow never show it to you? No.
18015. You never heard of it in any way? I might have seen it in the newspapers. I have received the *Sydney Daily Telegraph* regularly.
18016. Did you never have any conversation with Mr. Gummow about that matter? No.
18017. Or with Mr. Carter? Not that I remember.
18018. Did they not write to you to ask you whether it was true or not? Yes, Mr. Gummow wrote.
18019. When did he write? About four or five months ago.
18020. Was he not in Adelaide with you four or five months ago? No.
18021. What did he say in his letter? He said nothing at all.
18022. Have you that letter? No.
18023. Did he not say anything about Mr. Hickson's son? No.
18024. Do you know Mr. Snodgrass well? I do.
18025. Why did he leave the firm? That I could not tell you.
18026. Do you know where Mr. Snodgrass is? I do not.
18027. *Mr. Gummow.*] As to the bank pass-books, you say that an alteration was made from names to numbers;—did you order the bank to put the numbers in? No.
18028. Did you make out the cheques to particular numbers, or were they the bank's own numbers? I made out the cheques in the names of the persons to whom the money was due.
18029. In the names of the persons with whom you were dealing? Yes.
18030. Have you ever drawn any profits out of the firm of Carter, Gummow, & Co.? No, none.
18031. As to "Blinkbonnie" to whom does the property belong? To my wife.
18032. In talking of it generally, do not people refer to it as your house? They do.
18033. They always talk of it as if it were your house? Yes.
18034. Is not the rent paid into your credit? Yes.
18035. With regard to the money which was sent from New South Wales to South Australia, four years ago, to start the South Australian contract, had Carter, Gummow, & Co. any contract here at that time? No.
18036. With regard to drawing cheques, did you ever draw any cheques for the firm before I left Adelaide? No.
18037. Do you know anything about the business of the firm further than what I tell you? Nothing.
18038. And you do not bother about those things? No.
18039. What was your position in Adelaide? I was managing the work.
18040. You kept the time? Yes.
18041. And looked after the men? Yes.
18042. And you were not troubled in any way with the financial part of the business? Not at all.
18043. You did not know whether the firm had an overdraft, or whether their account was in credit? I did not.
18044. So that really all that you knew about the business you found out from me? Yes.
18045. And whether I told you a truth or an untruth, you were none the wiser? No.
18046. Do you know whether Mr. Hickson, junior, was ever a partner in the firm? No; he never was that I know of.
18047. What had young Mr. Hickson to do? His duty was to look after the levels and alignments of the tunnels.
18048. *Mr. Smith.*] When you were up here to sign the bond you made a declaration? Yes.
18049. You will see it upon page 213 of the Parliamentary return. It is as follows:—

## STATUTORY DECLARATION.

I, JAMES GILLAN, of Dulwich Hill, in the Colony of New South Wales, householder, do hereby solemnly declare and affirm that I am possessed of property to the value of £6,000 sterling and more, and that such property consists of cash at bankers, freehold and other property. And I make this solemn declaration as to the matters aforesaid according to the law in this behalf made, and subject to the punishment by law provided for any wilfully false statement in any such declaration.

Taken and declared at Sydney, this 27th day  
of May, 1895, before me,—

HAROLD F. NORRIE, J.P.

JAMES GILLAN.

Where

Where was the property to which you referred? It was in money matters—in the firm of Carter, Gummow, & Co., for instance.

J. Gillan.

18050. Where was the freehold property;—had you any freehold property? I had none.

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18051. Was there any other property? Not that I know of.

18052. So that the declaration is incorrect as to freehold property, at all events? Yes.

18053. Did you read that declaration before you made it? Partly. I did not go thoroughly into it. It was my firm belief at the time that I was worth £6,000.

18054. Did you not see in the bond reference was made to freehold property? I did not notice it at the time.

18055. *Mr. Parkes.*] On what date was it that you started the Adelaide job? About the beginning of September, 1892.

18056. The bank-book I hand you is a Sydney book, is it not? I could not say.

18057. It shows a transfer to Adelaide of £5,000, does it not? I never saw the book before.

18058. That was sent over to Adelaide on fixed deposit to carry out your work? It may be so.

18059. Afterwards did you not apply to have that £5,000 paid into your account in Adelaide? That I could not say. Mr. Gummow might have applied. I did not.

Frank Moorhouse Gummow:—

18060. *Mr. Parkes.*] Did you not transfer £5,000 from your account in Sydney to your Adelaide account? Yes.

F. M. Gummow.

18061. And afterwards you applied to the Adelaide authorities to have that money paid into your credit? Yes.

18 Sept., 1896.

18062. It was afterwards transferred back to your account in Sydney in large amounts at different times? £4,000 at one time and £1,000 at another.

James Gillan recalled and further examined:—

18063. *Mr. Gummow.*] Do you remember my coming over here early last year with reference to Contract 77? Yes.

J. Gillan.

18064. Do you remember my return? I do not know what date it was.

18 Sept., 1896.

18065. Do you remember my telling you that you were put down as a surety to the extent of £6,000? Yes.

18066. Will you tell His Honor exactly what occurred? You said I was worth so much in the pound, and you gave me all the particulars.

18067. Did I tell you that you had to come up to Sydney to sign a bond? Yes.

18068. Did you say that you were worth £6,000 before you left Adelaide? Yes.

18069. Did I tell you that the £12,000 bond was the extreme amount? Yes.

18070. Did I tell you that the three partners of the firm, yourself, and Mr. Forrest would have to pay the damage between us if there were any loss? Yes.

18071. That you would not be actually liable for the full amount of £6,000? No; that I should be liable for the amount of £3,000.

18072. You are sure of that? Yes.

18073. *Mr. Parkes.*] I suppose nobody read the bond over to you before you signed it? Mr. Carter and I read it over partly. We did not go into it particularly.

18074. Did you notice what it contained? I could not tell you now.

18075. You thought it was a bond to the amount of £6,000? Yes.

18076. You thought that if you signed that bond you must be worth £6,000? Yes; that I must be worth £6,000.

18077. *Mr. Gummow.*] Did you not always depend upon Mr. Carter and myself absolutely in financial matters? Yes.

18078. On my telling you to come up and sign the bond, did I consult you as to whether your name was to be put down? I asked you for the particulars and you let me know.

18079. What I told you, you believed to be true? Yes.

18080. You came up and Mr. Carter read over the bond with you? Yes.

18081. Did you take Mr. Carter's version of it—did you take what he said to be correct? I depended upon him just the same as I would upon you.

18082. *His Honor.*] No one in the office asked you any question as to how you made up the £6,000? No.

18083. They did not cross-examine you as to your means? No; they did not.

18084. *Mr. Parkes.*] Were you a stranger to them;—had you seen Mr. Norrie before? No; never.

18085. Had he seen or did he know you? I do not think so. He might have seen me in regard to different contracts. I could not say. I do not recollect having seen him.

18086. Did he put any question to you as to whether you had any connection with the contract? I do not recollect. He might have done so when he handed over the bond to be read and signed.

18087. You do not remember his asking you any question? No; I do not remember it.

18088. *Mr. Smith.*] I suppose he asked you the usual questions as to whether you had read the declaration and as to whether the contents were true? He might have done so. I do not recollect.

Joseph Davis recalled and further examined:—

18089. *His Honor.*] You desire to make a statement? Yes. It is in reference to the memorandum put in upon page 295 to the evidence of Mr. Christie. You will see that at the bottom of the page he refers to clause 20 of the general conditions. He says:—

J. Davis.

18 Sept., 1896.

On 23/3/93, Mr. Armstrong, as agent for Carter & Co., applied for a return of the deposit (£2,000), held by the Department. This application was refused. [See printed papers, Nos. 57 and 58, on pages 315 and 316.] The application was renewed by W. Armstrong, 21/4/93, and after it had passed through the hands of various officers, Mr. Hickson added a minute, as follows:—"A voucher has been signed to-day for work done, amounting to £1,453 9s.—R.H., 27/4/93." This

J. Davis. This minute of Mr. Hickson does not disclose the fact that, in the certificate he refers to, the department actually returned a portion of the retention money, viz., £222 17s. 7d., nor does it disclose that, to produce this amount of 18 Sept., 1896. £1,453 6s., the department had made an advance on 900 casks of cement at 16s., amounting to £720.

Further, by the ordinary reading of Mr. Hickson's minute, it would not appear to authorise any return of the retention money; but, as he quotes the amount, the certificate must have been before him, and it bears evidence that £222 17s. 7d. of the retention money had been returned.

I wish to say as to the amount of £222 17s. 7d., retention money, that the amount was over and above 5 per cent. of the amount of the contract worked out at schedule rates, and that, although the general conditions attached to the contract were the old general conditions, and therefore specified that 10 per cent. retention money was to be kept in hand, it was customary at that time upon all contracts, as shown by Mr. Hickson's minute, which is given in the printed papers, to return any money over and above 5 per cent., and in that way anticipate the new general conditions. With regard to the 900 casks of cement advanced upon, that was done, as the printed papers show, upon the authority of the Minister, and an agreement was drawn up authorising it.

18090. *Mr. Smith.*] What is that minute of Mr. Hickson's which is referred to upon page 296? That is the minute to which I refer.

18091. Mr. Christie states that the action of Mr. Hickson is at variance with his minute? I do not see in what way it is at variance with the minute. What I wished particularly to call attention to was that the sum of £222 17s. 7d. was returned in accordance with the practice of the department—that is to return anything over and above 5 per cent. in anticipation of the new general conditions.

18091½. The new conditions were in force at the date of Mr. Hickson's minute? But not upon this contract. They were generally in force—they were being anticipated upon all contracts.

18092. *Mr. Parkes.*] What is the date of the issue of the new general conditions? I could not give you the precise date this morning; but I could ascertain it.

18093. *His Honor.*] Were they approved by the Minister? They were the result of several conferences of the Board of Reference. The Minister asked the Board of Reference to look into the matter as one of the first things they did when they were appointed. One of their proposals was that only 5 per cent. retention money should be retained upon contracts at that time. Contract 79 was running, so that when the 5 per cent. was reached on that contract all the retention money over and above that amount was returned.

18094. Was there not a minute by the Minister? At the time he appointed the Board of Reference he specifically mentioned the general conditions in his minute.

18095. Could that be produced? I think so.

Charles O'Hanlon sworn and examined:—

C. O'Hanlon. 18096. *Mr. Davis.*] What is your position in the department? I am Road Superintendent at Queanbeyan, in the Roads Department.

18 Sept., 1896. 18097. For how long have you been in the Roads Branch of the Public Works Department? Since June, 1895.

18098. What were you before that date? Resident Engineer in the Sewerage Department.

18099. For how long before that? From October, 1889, up to June, 1895.

18100. Have you had to do with Carter, Gummow, & Co., or any member of the firm, professionally? I had charge of one of their contracts at North Shore in 1889 and part of 1890.

18101. On what date was that contract finished? About the middle of 1890, I should think. I could not state the exact month.

18102. Have you had anything to do with any of their works since then? No.

18103. Did you know Mr. Carter before you had to do with his contract at North Shore? Yes; I knew him about twelve months after I came to the Colony.

18104. You have been on friendly terms with him since, as well as before that date? Yes.

18105. You had some monetary transactions with Mr. Carter, had you not? Yes.

18106. On what date was that? 26th June, 1894, was the date of the first monetary transaction I had with him.

18107. Will you explain to His Honor precisely how it arose, and what was the nature of it? I had invested some money in the purchase of land for a residence. The money I had was not sufficient to buy the land and complete the residence. I found that what I had would not carry me through. I made arrangements with a connection of mine for the advance of enough money to complete the building, but owing to some flaw, the arrangement was not completed, and I was put into a corner for the want of money. Mr. Carter was a personal friend of mine at the time, and I spoke to him about it, having no idea at that moment that he would lend me the money. I spoke to him about it quite casually, and he at once said, "I will see you through"; and he advanced me sufficient money to complete the building. When the building was completed, he said I could get a mortgage and return the money.

18108. This friend of yours had failed you, and it was your intention, was it not, to do something of the kind with him? Yes; he was going to get the money from the bank.

18109. And you were to pay him back in a similar way? Yes.

18110. You afterwards took that course in regard to Mr. Carter? Yes.

18111. How much did you borrow? The amount was not altogether in cash; some was in material. The total amount was £600. The first instalment was paid on 26th June, 1894, and the final repayment was on 3rd October, 1894.

18112. Under what circumstances was the money repaid—how did you obtain the money for repayment? I obtained a mortgage on the property for £650. I got the mortgage through Johnson, Minter, and Simpson, and I then repaid the £600 direct to Mr. Carter.

18113. Have you anything further to say as to the transaction? Nothing except this: that it was an entirely friendly transaction. I did not see how it could influence me one way or the other, because I had no connection at all with those contractors.

18114. At the time you borrowed the money, on what work were you engaged? I was engaged all over the place. I had nothing definite to do. I was here and there. I was on survey work; I relieved Mr. Boys at North Shore. I was assisting at the Glebe, and I went all over the place. I had no definite job.

18115. It was in 1894 when you borrowed the money? Yes.

18116.



18116. About what time was it that you were engaged at Newcastle—it was about then, was it not? No; C. O'Hanlon. previous to that, I think. 18 Sept., 1896.
18117. Is there anything else you would like to explain? I might perhaps add that during the time I had the loan of this money Mr. Carter had the deeds of the land, and held the building as security.
18118. Did you pay him any interest for the money during the time you had it? No; I offered it to him, but he would not accept it.
18119. Do you think, in the light of subsequent events, that in the same circumstances you would act differently? I scarcely know how to answer that question. I suppose you mean, what would I do if a similar offer were made me in similar circumstances?
18120. In view of the way things have turned out, and you had the opportunity to take the same course, would you take it or not; you are supposed to be wiser to-day than you were two years ago? I should feel inclined to leave the matter entirely alone until I had money of my own with which to complete the work. I do not think I should be in such a hurry again.
18121. *Mr. Gummow.*] You are a personal friend of Mr. Carter? I should think so. During the whole of the time I have known him we have been very great friends.
18122. You are a married man? Yes.
18123. Your families visit one another? Yes; they did while I was in Sydney.
18124. Did Mr. Carter take any interest in the building of the house when it was in progress? No; he did not. I think he just came to see it when it was finished.
18125. Did Mr. Carter give you a wedding present when you got married? Yes; he gave me a spirit-stand containing three bottles.
18126. Did you accept it as a wedding present? Yes; and I was very much obliged for it too.
18127. *Mr. Parkes.*] On what contract were you Resident Engineer? On No. 60, at North Shore. It was a pipe contract.
18128. Not upon 79? No.
18129. And not at the Glebe? Not upon Mr. Carter's contract there. I was on a job of Lemon and Spencer's at the Glebe.
18130. What was the date of your mortgage from Johnson, Minter, and Simpson? I could not exactly tell you. I know that the money was repaid on the 3rd of October. I arrive at that date in this way: I borrowed £650, out of which Mr. Carter got £600 and I got £45 after paying legal expenses. The money was placed to my credit on 3rd October, and I conclude, therefore, that that was the date of the completion of the transaction.
18131. *His Honor.*] How long have you known Mr. Carter altogether? Since 1888. I came to the Colony in 1887.
18132. Were you living at North Shore after you first came to this country? I was living at Darlinghurst.
18133. How did you come to meet Mr. Carter? I met him casually; I was introduced to him in the street.
18134. By whom? I could not tell you.
18135. There was merely an introduction in the street? Yes. I heard that Mr. Carter was at the time in the Railway Department. I do not think he was a contractor.
18136. *Mr. Gummow.*] You lived at North Shore for some time? Yes; but not in 1888.
18137. When did you go to live there? In 1889. I then had charge of a contract at North Shore, and I went to live there for convenience sake. I was then a bachelor and could live where I liked.

Joseph Davis recalled and further examined:—

18138. *His Honor.*] You have looked into the matter of the general conditions of which you spoke just now? The document I produce shows the new general conditions. You will see that they were approved on the 5th February, 1894. They had evidently been under consideration twelve months or more beforehand. The papers show that there is a minute by the then Crown Solicitor, Mr. Ernest Smith, dated 21st June, 1892, in respect to these very general conditions, so that they must have been under consideration some eighteen months at least. I should be incorrect, however, in stating that they were in force on the date of the voucher referred to in Mr. Christie's memorandum, viz., April, 1893. They were anticipated. That would be the correct expression to use. J. Davis. 18 Sept., 1896.
18139. They were directed to be carried out by Mr. Bruce Smith, and his direction was subsequently confirmed by Mr. Secretary Lyne? Yes.

George Forrest recalled and further examined:—

18140. *Mr. Gummow.*] How long have you been in charge of Contract 77? Since the middle of January. G. Forrest. 18 Sept., 1896.
18141. You did not take charge of it when it was started originally, last year? No.
18142. You were not in charge at all last year? No.
18143. You had nothing to do with it then? No.
18144. Do you know Mr. Gillan? Yes.
18145. How many times have you spoken to him in your life? Not over a dozen, I think.
18146. Have you ever been on a job or on a work together? Never.
18147. With regard to books;—do you remember you and Mr. Snodgrass telling Mr. Carter that there was no necessity to keep books as far as you were concerned? No; I do not.
18148. You were upon Contract 69? Yes.
18149. Did anybody ever mention any bad work to you upon that contract;—did Darcus, for instance? No.
18150. Did you leave the whole of the matters connected with the contract to him? By no means.
18151. What was Darcus? A carpenter on the work.
18152. Working under you? Yes.
18153. Were you there daily to look after the work? Yes; I was there eight hours every day.
18154. Were you on the pipe contract that Carter & Co. had at North Sydney some few years ago? Yes.
18155. Do you remember a man named Tom Wright? Yes.
18156. Will you look at Question 2486; you will see there a reference to Inwood's matter;—do you remember some trouble with reference to some concrete between Wright and Inwood? Yes.

18157.

- G. Forrest. 18157. Do you remember going over there one Saturday evening with Inwood? No; it was on a Saturday afternoon when the row occurred.
- 18 Sept., 1896. 18158. Were you there at all? No; I was not within miles of the place.
18159. Do you remember whether you were sober at the time? Yes; I was perfectly sober.
18160. Did you ever assist Wright to unload cement upon any of the works? No.
18161. Did you ever assist anyone to do so? Never.
18162. If Wright says that you and Carter were half drunk, at any time, would that be true? No; Mr. Carter does not take it at all. I take a little now and again.
18163. *Mr. Parkes.*] Was Wright drunk? I have seen him drunk. He was drunk that afternoon right enough.
18164. *Mr. Gummow.*] Let me refer you to Question 3024;—did you ever have any drinks with Inwood? Many times.
18165. Did you always shout? Not always; I had many drinks with him before he entered the Service.
18166. Did you ever gamble with him;—did you ever play pitch-and-toss with him? No, never.
18167. You have not played 6d. or 1s. a corner for drinks with him? No.
18168. So that Inwood could not have won money from you? Not from me.
18169. Did you ever cheek Inwood and strike him? No.
18170. Did you ever hear of such a thing occurring in connection with Inwood? No.
18171. You did not hear of anyone else doing it? No.
18172. You made a statement before the Commission some time ago as to your property in New Zealand;—you said you had some property in M'Andrew Road and George-street, Dunedin? Yes.
18173. You still maintain that that is your property? Yes.
18174. Do you get any rent from it? The documents I produce are the returns I have received from my agent in New Zealand. You will see from them what the rent is.
18175. *His Honor.*] You receive the rent yourself? Yes; you will see that I received one of those returns this week.
18176. *Mr. Gummow.*] Is there any of your property on or near a tram-line? Yes; the one at the corner of George-street.
18177. Is that property in your own name? Yes.
18178. There is a report here from the Commissioner for Land and Income Taxes at Wellington, Mr. John McGowan, stating that the property is in Mrs. Forrest's name? It was in her name. It has been in my name for two years past. Mrs. Forrest willed it to me when she died, three years ago, on 16th January. It was conveyed to me in the month of May of the same year.
18179. So that at the time you signed this bond it was actually your property? Yes.
18180. Sir Robert Stout is your solicitor in New Zealand? Yes. Bradley and Sons put the matter through here.
18181. What rent do you receive from your properties? £100 a year.
18182. You estimated the value of your properties in New Zealand, including the vacant sections, at £2,500? I said I would not sell for less than that.
18183. You still consider that that is the fair value of them? Yes.
18184. *Mr. Parkes.*] Does one of the returns you have produced represent six months' rent? I ought to receive the returns every three months, but they are transmitted irregularly.
18185. For what portion of the year would this return of £30 15s. be for? The rates would probably have been paid from that amount.
18186. £52 5s. 6d. would be six months rent? Probably.
18187. *Mr. Gummow.*] Still you have property in New Zealand of the value you have represented? Yes; and it is in the street I mention.
18188. As to the signing of the bond for Contract 77, did you consider that you were running any risk? No.
18189. Did you think the structure was a sound one before you signed the bond? I did.
18190. Did you know that of your own knowledge? No; you and Mr. Baltzer told me about it. The Monier system was new to me at the time.
18191. In tendering, to whom do you leave matters? To you, absolutely.
18192. You have faith in my judgment as to prices and risk? Yes.
18193. In those matters you left the whole thing to me? Yes.
18194. You took my word that a certain tender was good enough? I took your word, of course. I thought that if it was good enough for you it was good enough for me.
18195. You knew that Mr. Carter and I also had a risk in the matter? Yes.
18196. You leave all financial matters to Mr. Carter and myself? Yes; everything.
18197. If you were told that your interest in the firm is worth £3,000, how would you know that it was so? I should take your word as that of an honorable man.
18198. You do not know anything apart from that? No.
18199. You fully trust me when I tell you that that is the value of your interest? Yes.
18200. *Mr. Parkes.*] Were you shown the plans for the Monier structure before the tender was sent in? No.
18201. You never saw the plans? I never saw the plans until I went on to the work.
18202. Did you know that the firm was going to tender for the job on the Monier system? I knew they talked about it.
18203. Who spoke to you about it? One of the members of the firm; I do not know which.
18204. Was it Mr. Carter or Mr. Gummow? I could not say.
18205. Did you know Mr. Baltzer in those days? Yes; I have known him for two or three years. I have not met him often.
18206. Did you know that he was making the plans for the Monier design? No.
18207. Did he not tell you who was making the plans for it? No. I knew that he was interested in it. If any one was making the plans I thought that either he or Mr. Gummow would be doing so.
18208. How long before you obtained Contract 77 did you know that the Monier design was to be sent in as a duplicate tender? I could not say.
18209. Did you know for any length of time beforehand? I could not say.
18210. But you did know before? I think so; but I knew very little about the matter.
- 18211.

18211. Did you anticipate that you were going to get the job on the Monier system? No; I had no idea of it. G. Forrest.  
18 Sept., 1896.
18212. Did you ever discuss the matter with Mr. Carter or Mr. Gummow? No.
18213. What contract were you on before you went to Contract 77? On 69.
18214. When 69 was completed you went straight across to 77? Two or three months afterwards. I was at Marrickville after the job was practically finished. I went to 77 a little after the new year.
18215. If Contract 69 had not been in existence you would have been supervising 77 all the same? I would have been assisting.
18216. Do you look upon the Monier system as a stable structure—as a structure without very much risk? Yes; I always thought a good deal of it, and I have had a little experience in building.
18217. Is it a difficult system to build? No.
18218. Is there any risk in it at all? I do not think there is any with careful work.
18219. Can ordinary workmen build it? Of course it takes a little time to get into it. They must be careful in construction, of course.
18220. What proportions of concrete were you mixing for the carrier? Ten, six, and one.
18221. Did you mix it yourself, or leave it to the men? I did not mix it.
18222. Did you sift the sand from the sandstone before you mixed up the concrete? Yes.
18223. It was sifted through what sort of sieve? A three-sixteenth sieve.
18224. Particles of half an inch could not go through? No.
18225. Was it always sieved? Yes.
18226. *His Honor.*] What do you mean by 10, 6, and 1? Ten of metal, six of sand, and one cask of cement.
18227. *Mr. Gummow.*] As to Contract 69;—did you sign the contract plan? No.
18228. As far as the Government were concerned you were not a partner in the case of 69? No.
18229. *His Honor.*] But as far as the drawing of profits were concerned you would come in then I suppose? Yes.
18230. *Mr. Gummow.*] Have you ever drawn any profits? Not yet.
18231. As to Contract 77; you went there early in the year;—why did you happen to go there;—was there any other partner there before you went? Mr. Snodgrass.
18232. You took his place? Actually I did.
18233. Do you remember whether you were a partner with Carter & Co., as far as the Government were concerned, in Contract 79 at North Shore? I could not say; I do not think so.
18234. You used to get your share of the profits, if there were any, and stand your risk? Yes.
18235. You left the whole matter to Mr. Carter? Yes.
18236. As to these Monier arches;—when you first commenced upon the work you did not know anything in particular about their construction? No; I took my instructions from you entirely.
18237. Did I come there and see each arch built for months from the very beginning? Yes.
18238. And Mr. Baltzer used to come too? Yes.
18239. *Mr. Parkes.*] The Bank-books show that you drew £43 a month salary as regularly as clock-work? Yes.
18240. There is an amount of £100 paid to Mr. Forrest and £583 to Mr. Carter;—what would those sums be;—would they not be out of profit;—the date is June, 1895? No.
18241. What would they be for? I might have borrowed the sum in my own case, but I do not know.
18242. And you would borrow it from the firm? I might.
18243. There are irregular items running through the firm's Bank-book of the same character;—would they be borrowings from the firm;—for instance, there is an item of £150 in the name of Mr. Carter;—what would that be? I have no idea.
18244. Was not a certain amount placed into your banking account in order to make up the amount put into your declaration;—was it not taken out of Carter & Co.'s account and put to the credit of your account? It was not.
18245. Did you not, at about that time, receive a sum of £350? No.
18246. Did you repay to the firm of Carter & Co. any sum of money;—did you transfer from your private account to the business account any sum of money? No.
18247. At no time? Not that I can remember.
18248. Upon April 11th, there is an amount of £50 in your name;—would not that be your profits as a partner? It might be two months' screw.
18249. You drew your screw just before that? Then I do not know what it would be.
18250. *Mr. Carter.*] What about petty cash? It might be that. I did not think of that.
18251. *Mr. Parkes.*] That, you think, would account for it? Yes.
18252. The irregular sums paid to you would be all for petty cash, you think? All in 1894 and 1895.
18253. All for petty cash? Yes.
18254. Even the amount of £100 would be for petty cash? I expect it was.
18255. *Mr. Gummow.*] What did you pay out of petty cash? I have paid as much as £30 a week to the Railway Department as freight for sand. Then there are all the timber accounts.
18256. These accounts had to be paid in cash? Yes. I paid nothing by cheque.
18257. Did the firm owe you anything;—did they borrow any money off you during the last six months? Yes. £250.
18258. Have you anything to show for it? Not a line. I have to trust you with much more than that.

MONDAY, 21 SEPTEMBER, 1896.

James Flood sworn and examined:—

18259. *Mr. Gummow.*] What are you? A carter at the present time.
18260. What were you before you started carting? I was contracting.
18261. Did you ever carry out any storm-water sewer work? Yes.
18262. I suppose you know what stone is required by the department for storm-water sewers? It must be the very best.
18263. Did you ever cart any stone from Annandale for Carter, Gummow, & Co.? Yes.
18264. Where did you get the stone? From Hayes' quarry, at Leichhardt. J. Flood.  
21 Sept., 1896.  
18265.

- J. Flood.  
21 Sept., 1896.
18265. Did you ever get any for them from Ferris' quarry? No; I do not know where that is.
18266. Did you come to us and offer to supply the stone? Yes; I went to Mr. Snodgrass.
18267. What did he tell you? He told me that he had partly let the stone, but that as he had known me so long, and as I was out of work, he would give me a show to cart it. He asked me where I could get it, and I told him. He then said I must get a sample.
18268. At what price did you offer to get it? I think it was 2s. 8d. He said I would have to get a sample and take it to the inspector. I got a sample, and he said it was very good stone, but he wanted some more of it. I brought some more, and I had then to wait a week while the stone went through the test.
18269. Did it pass? Yes.
18270. And did you supply similar stone to that? I did.
18271. About how much do you think you supplied? About 1,200 or 1,500 yards, as nearly as I can remember now.
18272. Did you ever cart the stone for any other Government sewerage contract? Yes; I carted for Phillips and Rhodes, and Holloway Brothers, also for John Ahearne, at Arncliffe.
18273. Was it similar stone? In the case of Phillips and Rhodes' contract at Petersham the stone came from the same quarry.
18274. Are you sure that all the stone with which you supplied us was of the best quality, and that it was equal to sample? Yes; it was the best bottom block. The Petersham and Leichhardt Council take the red stone from the top. They prefer it to the hard close-grained stone at the bottom. The quarrymen get rid of that all the year round to the Councils, and they then have the best bottom block stone left for sewerage contracts and other work of the kind. The department would not take the top block stone.
18275. Do you consider that the Government inspector was exact in seeing that the best stone was brought to the contract? They were very particular. If there were two or three red stones in your cart the inspector would not allow you to leave it. When you tipped it out of the cart he would make you put the red stones back again, and if the same carter brought any more he would be knocked off the job.
18276. How many loads a day could you bring? About ten.
18277. Do you know where Ryan's quarry is? No.
18278. Do you consider from your knowledge of contracts for the same class of work that the stone with which you supplied us was quite equal to any stone you have supplied to other contracts? I do not think better stone could be used than that which comes out of Hayes' quarry.
18279. Have you ever seen any of Ryan's stone? No.
18280. *Mr. Davis.*] You carried out a large storm-water sewer contract at Croydon among other works you have done? Yes.
18281. Do you consider, taking the stone used at Johnstone's Creek through and through, that it was quite equal to that which you used at Croydon? Yes, I do.
18282. The stone that you used at Croydon came from Canterbury? Yes.
18283. And the stone you carted to Johnstone's Creek was quite equal in quality to that? Yes.
18284. *Mr. Parkes.*] Will you tell His Honor how many contracts you have done under the Water and Sewerage Board—could you recollect them? I had a contract at Redfern, Waterloo, and Alexandria. Then I did a small job at the Circular Quay, and another one at the top end of Redfern-street.
18285. Did you do one at Ashfield? That was not under the Water and Sewerage Board.
18286. How many storm-water sewers have you built? I did one for the Railway Commissioners at Gunnedah, and a large one at Croydon.
18287. What was the cost of the largest? The Water and Sewerage Board's sewer was the largest; that was £17,690.
18288. What were those you did under the Works Department? In one case the contract was £12,500, and in another case £7,000.
18289. During the carrying out of these contracts did you ever get an advance upon your material or plant? No; I never asked for it.
18290. Did you ever get your deposit returned to you before the final completion of the job? No.
18291. Did you ever get your retention money returned to you? I could not say that.
18292. Do you recollect ever having had it returned to you? I do not remember.
18293. Did you ever buy cement from Carter, Gummow, & Co.? I have bought cement from Mr. Gummow, but he was not at the time a partner of Mr. Carter.
18294. Did you ever buy any off Mr. Carter? Yes, from Carter & Co.
18295. You paid them by cheque, I suppose? I think so.
18296. If a cheque appears in their pass-books from Flood, or Rutherford and Flood, it will be for cement? Yes, for nothing else, I think. I remember buying some waggons from Mr. Gummow at one time.
18297. But if there were a cheque in your name in the account of Carter & Co., it would probably be for cement? I cannot remember that it would be for anything else.
18298. Do you recollect when you bought cement from Carter & Co.? I think it was when I was on the Ashfield job.
18299. What would be the date of that? About four years ago.
18300. In 1892? Something like that, I suppose.
18301. Have you ever had a certain class of work taken out of your contracts, and other work substituted, or have you ever had your work altered in any way? I do not remember it. I do not think so.
18302. You cannot recollect about the date upon which you obtained the cement to which you have referred? No.
18303. Were there any considerable number of barrels? I could not tell you how much. I got a good bit, I think.
18304. Would it be as much as 500 barrels? It might be. I know that the firm did us a good turn in letting us have it, because we were stuck up for cement at the time.
18305. *His Honor.*] You could not get it in the market? None that had passed the required test.
18306. Carter & Co. had tested cement, I suppose? Yes.
18307. *Mr. Parkes.*] I suppose you would have some record of your cement purchases from Carter & Co.? Yes, they would be all in our books.
18308. Is the occasion to which you have referred the only occasion on which you bought cement from Carter & Co.? I think that was all.
- 18309.

18309. It was for 600 casks, was it not? I could not tell you the number of casks. Whatever the amount of the cheque may be it would be for cement. J. Flood.
18310. And you say that on no occasion did you receive any advance from the department upon your material or plant? No. 21 Sept., 1896.
18311. *His Honor.*] Did you ever get any cement from Carter, Gummow, & Co.? Not from Carter, Gummow, & Co.
18312. You obtained some from Carter & Co.? Yes; and from Gummow and Gillan. We considered they were doing us a good turn at the time. I know that they had not too much cement on their job when they obliged us. They let us have a few casks to keep us going.
18313. *Mr. Gummow.*] It was an obligation as far as we were concerned, not a business transaction? Yes.
18314. *Mr. Parkes.*] But you paid for it? Yes.
18315. You did not return the cement? No.
18316. *Mr. Gummow.*] Did you never return any to Gummow and Gillan? I think we did.
18317. *Mr. Parkes.*] But you did not return any of the 600 casks to Carter & Co.? No.
18318. The cheque for £300 appearing in one of the Bank passbooks would be for the purchase of that cement? Yes.
18319. *Mr. Davis.*] Did you get any extensions of Contract 76? Yes.
18320. How many? 76A and 76B.
18321. Two extensions? Yes.
18322. Can you remember the amount roughly? No.
18323. You got the extensions at your schedule rates? Yes.
18324. And they were considerable extensions? Yes.
18325. Do you remember the iron girders being eliminated from Contract 76? Yes.
18326. You also remember, perhaps, that it was questionable according to the drawing whether those girders should be put in or not? Yes.
18327. You thought that inasmuch as you had ordered them the department ought to meet you in the matter? Yes.
18328. And the department did meet you? Yes, they took the girders off us at what they cost us. It was not altogether clear that we should have to use them.
18329. It was discovered that the girders were to be put in if ordered? Yes.
18330. And you had overlooked that? Yes.
18331. And the department took them off your hands and paid you their cost or thereabouts? Yes.
18332. Did you get any assistance to move the department or the Minister to give you that concession? No, I think I went to you.
18333. You did not go to the Minister? No, not about the girders.
18334. You are sure about that? Yes; I only went to him, I think, in respect of the fines, but I would not be quite certain. It happened a long time ago, and I have never bothered my head about it from then till now.
18335. *His Honor.*] You had not much trouble about it then? No.
18336. You thought the arrangement was a fair thing, and the department did not take advantage of the words in the specification which they might have relied upon? Quite so.

Nicholas Ryan sworn and examined:—

18337. *Mr. Gummow.*] What are you? A quarry-master.
18338. Do you supply stone to different contractors? Yes.
18339. For what purposes is your stone used? We have various sorts. Some is building stone, and some is used for ballast. N. Ryan.
18340. It is used for general building purposes? Yes; and for ballast. 21 Sept., 1896.
18341. Do you remember whether any stone went from your quarry to Carter & Co.'s job at Annandale? Yes; I supplied some there.
18342. Who were the carters? M'Millan and Burcombe.
18343. Was the stone which they took away equal to the stone that had been tested from your quarry;—have you ever had any stone tested by the Sewerage Department? No; it was a very good quality of stone. I have here Professor Warren's tests of it.
18344. Was the stone taken away by M'Millan and Burcombe of similar quality to the stone referred to in that test sheet? Yes. We have four or five different sorts of stone. Some is suitable for building purposes, and some for ballast. The stone used for ballast is a very close-grained, hard stone. It is not suitable for building purposes; it is too hard.
18345. At all events the stone you supplied through M'Millan and Burcombe was equal to the stone which you supplied to other sewerage contractors? Yes.
18346. Do you supply stone from your quarry to other sewerage contractors? We have supplied stone to Rogers and O'Neil, and Johnstone and O'Rourke, and we have supplied it indirectly to other contractors.
18347. Do you know whether the stone carted by M'Millan and Burcombe was equal to the stone supplied to O'Neil and Rogers? As far as I know it was about the same class of stone.
18348. Do you know why M'Millan went to your quarry to get stone instead of going to the local quarries? Because, I suppose, it was better stone. I cannot say for certain.
18349. Did you ever tell O'Neil that the stone which was condemned on his contract was taken to Carter, Gummow, & Co.'s contract? No; I could not have said that, because I know nothing about it.
18350. Was any stone condemned on O'Neil's job taken back to your quarry? No.
18351. If it has been so stated it has been wrongly stated? Yes.
18352. So that Carter, Gummow, & Co. could not have used your condemned stone at half-price? Not in the case of my stone any way. No stone was condemned on O'Neil's job, or, if it was, I was paid for it. I know that I was paid for all the stone that I delivered.
18353. Is this statement correct—"Ryan says emphatically that he sold to Carter and Gummow, with the approval

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approval of the Government officials, the whole of that stone to an enormous extent which was condemned on O'Neil's Contract 83"? That is false.

18353. Have you ever heard anything about that statement being made in the House? Yes; I read it in the daily press.

18354-5. Did you deny it in any way? I wrote to Mr. Parkes about it in the first place, telling him that it was incorrect. Mr. Parkes then sent to me to come over and see him. I went up to the House, and then I denied the statement.

18356. Did you ask him to give it a denial? I did; but I did not wish to be too hard, and I thought it would all come out at the Commission.

18357. *Mr. Davis.*] What was the exact quality of the stone you supplied to Carter, Gummow, & Co.? I could not tell you.

18358. Was it fine or coarse grained stone? I do not think there can have been any coarse-grained stone which went to them. The coarse-grained stone is used more for kerbing and guttering.

18359. Do you think the quality of the stone would be that given in items 1, 2, and 3, of Professor Warren's test-sheet? Most of it would, in my opinion, stand a test equal to that.

18360. The stone you supplied, in your opinion, would stand a test equal to No. 1 in that list, viz., 7,646 lb. per square inch, or No. 2, 7,365 lb. per square inch, or No. 3, 7,472 lb. per square inch? Of course, we did not test any of the stone we sent to them. The tests from which you are quoting are tests of stone picked out from different parts of the quarry.

18361. Do you know what the sewerage test is per square inch? I could not say.

18362. If it were 6,500 lb. per square inch, then the first three tests which I have quoted would exceed it? Yes; the stone referred to in the test-sheet was tested for building purposes.

18363. *Mr. Parkes.*] You came to me on the day before the Commission first sat, did you not? I think it was on the Thursday evening; the Commission started on the Monday.

18364. When we talked the matter over you told me, did you not, that the contractors had got your stone tested, and had then taken stone from other quarries? Yes; after they had carted stone from me for a while they took it from other quarries.

18365. On your tests? I cannot say that.

18366. It did not all come from your quarry? No.

18367. That is what you told me? Yes; I said that they stopped getting stone from me.

18368. Your quarry is perhaps the best in the city of Sydney? They reckon that it is the best in Sydney.

18369. The stone was used in this building, and also in the construction of the Post Office? I do not know about that; but the stone in the Public Works Office is all from my quarry.

18370. And the same applies to the Lands Office? All the big stone; also the stone which is being used in the Art Gallery now in course of erection.

18371. How many loads of stone did Carter, Gummow, & Co. take from you? I could not say; perhaps 300 or 400—perhaps 500—it might be more. I could not say what the quantity was.

18372. Could you not say from your books? No; we do not book ballast as a rule—we go by ticket. Quarrying ballast is not a paying game.

18373. Did you not tell me that O'Neil and others did the same thing;—that they got your bottom block stone tested, and then got stone from inferior quarries? No; what I said was that they got stone from other quarries, or from carters who go about buying stone and delivering it to contractors. O'Neil & Co. had been getting ballast from various quarries, and it had been condemned. They then came to me and asked me to supply them with ballast. I would not do so until they went to the inspector for his approval. I think I supplied them after that for all their jobs, and none of the stone was condemned as far as I know; at all events, I was paid for all of it.

18374. Did Carter & Co. also draw stone from other quarries? I think they were only drawing it from my quarry at the start. They carted some from me at the start. After a time they got it all from elsewhere—from the local quarries, I think.

18375. That is the statement you made to me? Yes.

18376. Did I not tell you that I would contradict O'Neil's statement to me in the House if you wished it, or that you could come down and give evidence before the Commission, and put the matter right there? Yes; I think I agreed to that, thinking that it would all come out at the Commission. I wanted it published so that the public would see the statement.

18377. I told you that at the time you applied to me? Yes. I understood that you were misinformed, or had been misled in some way by statements which had been made to you.

18378. You do not think that more than 500 loads were taken from your quarry? I could not be sure. Even if I looked it up, I do not think I could come to any definite conclusion. I know that they got more ballast from other quarries than they got from me.

18379. As to your refuse—is it not a common thing for carters to come to the quarry and take away your refuse? Yes. They pay us a small amount and take it away. If we cannot get anything for it we give it to them.

18380. As to refuse which you cannot dispose of otherwise than at a low rate—what rate do you get for for it? Sometimes 6d. and sometimes 1s. We got 1s. 6d. from Carter, Gummow, & Co. in the first place, but the price was afterwards reduced to a shilling.

18381. That rate applies to the stone with which you supplied them? Yes. I think the price is reduced on account of their getting stone handier to their works for less money.

18382. *His Honor.*] How far would your quarry be from the place where the works were going on? I think it would be about  $1\frac{1}{2}$  miles round the road.

18383. *Mr. Gummow.*] With regard to your quarry, you consider it the best round about Sydney? Yes.

18384. That is for building purposes? Yes. I have some stone which will stand a test equal to that which any stone in the Colony will stand.

18385. Is the stone you supply for concrete the same stone which is used for building purposes? No; the waste would go for concrete.

18386. If you were supplying stone for ballast, would you supply your best building stone? Certainly not. We have stone which is not altogether suitable for building, but which is suitable for ballast. It is too small for building, and we use it for ballast.

18387. Have you any idea how long M'Millan and Burcombe were carting from your quarry? M'Millan was not carting there long, but Burcombe was carting for several weeks afterwards. 18388.

18388. Would you be surprised to hear that they carted as many as 3,000 yards from your quarry? They may have done so. I could not say; but I should not think they carted anything like that. It was done by ticket. N. Ryan.  
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18389. You say you got 1s. 6d. at first, and 1s. afterwards? Yes.
18390. Did you give them inferior stone for the 1s.? No; it was the same quality of stone.
18391. You did not, when you reduced the price by 6d., give them an inferior article? No. The carters said they were getting the stone for less elsewhere, and that they could not draw it from me unless they got it at the same price, or something to that effect. I cannot remember the words.
18392. Burcombe did not draw regularly from your quarry, did he? No. He was drawing regularly, however, for a considerable time.
18393. For how long? It may have been two months or more.
18394. After that, what did he do? I cannot say. During the latter end of the time Burcombe was carting from my quarry M'Millan was drawing from various quarries round about Annandale.

Alexander M'Millan sworn and examined:—

18395. *Mr. Gummow.*] What are you? A carrier and contractor. A. M'Millan.  
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18396. You have been carting stone for Carter, Gummow, & Co. for some time, have you not? Yes.
18397. You carted a good deal of stone to their works at Johnstone's Creek? Yes.
18398. Where did you get it from? I got some from Ryan's quarry, and some from Meredith and Westbrook's.
18399. Where else? Some from Hayes's quarry.
18400. Anywhere else? Yes; Paling's quarry.
18401. Anywhere else? Yes; I got some from Benson, at Marrickville, and some from Swivel, at Marrickville.
18402. Do you remember a week before the contract for the Johnstone's Creek stormwater channel contract was let driving Mr. Snodgrass and myself round to different quarries? Yes.
18403. Where did we go? We went to Hayes's quarry.
18404. Do you remember telling us at what price we could get stone from there? Yes; 1s. 4d. a yard. We went to two quarries, I think.
18405. Do you remember after Carter, Gummow, & Co. had got the contract what price we were asked for the stone? Yes; one quarry wanted 1s. 11d., and the other 1s. 9d.
18406. What did you say to that? I said you could get Ryan's stone from Pymont for 1s., and that it had passed the test before.
18407. Is that the reason we did not deal with the local quarries in the first instance? Yes; you said it did not matter, and that you would rather give 1s. more than have the firm put to any inconvenience over the stone. You said you would rather give 1s. more and have the best stone.
18408. Did I tell you that we would not be put upon by any ring? You did; you said you would rather give 1s. more for the stone.
18409. And that is the reason why you went to Ryan's quarry instead of dealing with the local quarries? Yes; I also went to Meredith's at the same time to keep the works going.
18410. How far away from the works would Ryan's quarry be? Two miles.
18411. How many loads a day could you do from there? Four.
18412. Have you any idea how much stone you took from Ryan's quarry? We agreed for 2,000 yards in the first place. There was no stone available at the time, and Ryan said he would not undertake to take any stone out unless we would take 2,000 yards.
18413. Did you take 2,000 yards? I believe we took more, but I could not say exactly.
18414. Do you think you took 3,000? More than 3,000 yards, I fancy. The first order was for 3,000 yards.
18415. What were you paying Ryan? 1s. 6d.
18416. Did he charge you 1s. 6d. all through? No. When he was quarrying stone at first there was no other work to do, and he had to put men on to get the ballast out alone. He first charged 1s. 6d., and afterwards 1s.
18417. Did he give you the same class of stone for the 1s.? Yes.
18418. After getting out the building-stone? Yes.
18419. You did not go to Ryan's quarry in the first place because the stone was better;—that was not your idea when it was decided to take it from Ryan's quarry? No.
18420. You told Mr. Snodgrass that you could get the stone for 1s. 4d. at the Leichhardt quarries before the tenders went in? Yes.
18421. And after the tenders went in they wanted 1s. 9d. and 1s. 11d.? Yes.
18422. If they had supplied it for 1s. 4d., would you have gone to Ryan's quarry? No.
18423. It was only on account of their raising their prices that you went to Ryan's quarry? That was all.
18424. What prices did you get from the firm when you were carting from Ryan's quarry? 3s.
18425. Did you get 3s. when you were carting from the other quarries? For a certain portion of the time.
18426. And what did you get afterwards? 2s. 6d.
18427. What was the reason of the 6d. decrease in price? Because I got the stone latterly from Hayes's and Westbrook's quarries at 1s. 6d.
18428. They lowered their prices when they found that you could get the stone for a less price, and that we would not put up with their rise? Yes.
18429. Do you know from hearsay, or general knowledge, that the stone you got was the best stone? Yes, I know it was the best stone.
18430. How do you know that? Mr. Lougheed told me that Meredith and Westbrook's stone was used upon Owen's job at Balmain, and that it was the best stone in the district. He said that if I could get that stone it was all right.
18431. You got a good deal from that quarry? Perhaps 2,000 yards or more.



- A. M'Millan. 18432. Have you ever carted stone for other storm-water channel contracts? Yes; for almost every Government contract which has been let during the last four or five years.
- 21 Sept., 1896. 18433. So that you have a very good idea of what class of stone is required by the Government? I fancy so.
18434. Do you consider that the stone you carted to Carter, Gummow, & Co.'s contract at Johnstone's Creek was better or worse than the stone you had carted to other contracts? I think the stone supplied to that contract was more closely watched than the stone supplied to any other sewerage contract. The inspector would allow nothing inferior to pass. Mr. Millner, the engineer, was there every morning with Mr. Lougheed, and they examined the stone.
18435. Was any stone condemned on that job? Yes.
18436. How much? I think five or six loads. A heap was condemned, but after it was all turned over there happened to be a few small pieces in it. I think there was about five loads out of 150 tons.
18437. Who condemned the stone? Mr. Millner.
18438. What was done with it? It was first taken into a paddock and it was then carted away to make a track in Nelson's Lane, Annandale.
18439. Do you do general carting for our firm? Yes.
18440. Plant, cement, or anything of that kind, I suppose you cart? Yes.
18441. How long have you been employed by the firm of Carter, Gummow & Co.? Five years or more, I think.
18442. During that time have you carted much cement about from one job to another? Yes; thousands of casks, I suppose.
18443. Did you cart any sand to the Johnstone's Creek Contract? Yes, to the Storm-water Sewer Contract.
18444. Did you cart any for the other work there—the arches? I carted it from one part of the work to another—that is from White's Creek to Johnstone's Creek—backwards and forwards.
18445. But did you deliver any sand on to the contract itself? No.
18446. Did you deliver any to the storm-water channel contract at Johnstone's Creek? Yes.
18447. Do you cart by day-work, piece-work, or both? Both.
18448. *Mr. Davis.*] You know the quality of the stone which you got from Ryan's quarry? Yes.
18449. Do you consider it good? It is the best stone I have seen for a long time.
18450. Was the other stone which you carted on to Carter, Gummow, & Co.'s works at Johnstone's Creek equal to it, or was it inferior in quality? I believe that Meredith and Westbrook's stone stands a better test.
18451. What have you to say as to the stone from the other quarries from which you carted in comparison with Ryan's stone? The Marrickville quarries are all good. It is all tested stone. The stone was only taken from there to keep the job going. Hayes's stone is a good class of stone; it has been used in the sewerage contracts.
18452. Speaking of all the quarries in relation to Ryan's, would you say that the stone from those quarries comes up to Ryan's stone in quality? Yes.
18453. You are quite positive about that? Yes; not as a cutting stone, perhaps.
18454. Not as a dimension stone, but for knapping or cracking perhaps it would stand a better test? Yes.
18455. *Mr. Parkes.*] Do you keep any books? Yes.
18456. Have you your books with you? No.
18457. You have in your books records of the business transactions to which you have referred? No.
18458. How is that? Well, that is my business, I suppose.
18459. Have you not kept a record of the money you have received and the money you have paid out in your business? No.
18460. I thought you said you kept books? In a manner of speaking.
18461. *His Honor.*] What books have you kept? A time book. All the men are paid for the time they are working.
18462. *Mr. Parkes.*] Have you kept a book showing the moneys you have received? No; I have no partners. I am alone in the business.
18463. Have you a bank book? No.
18464. *His Honor.*] Do you not keep a banking account? No.
18465. *Mr. Parkes.*] How did Carter & Co. pay you—by cheque or by cash? I think I have received a cheque once or twice from Carter, Gummow, & Co.; but that is all.
18466. What did you do with the cheques? I went to the Bank of New Zealand and got them cashed.
18467. You did not pay them into any banking account? No; I got them cashed, and paid the men with the proceeds.
18468. *His Honor.*] Do you pay your men once a week? Yes; I paid the men at the same time that Carter, Gummow, & Co. paid me.
18469. The money would come into your hands and go out again, with the exception of a portion which you used for yourself? Yes.
18470. *Mr. Parkes.*] I suppose you gave Carter, Gummow, & Co. a receipt for the money? I never gave Carter, Gummow, & Co. a receipt for any money.
18471. You have never done so? No.
18472. How were you paid? I am paid for the time kept by the drays.
18473. How often? Every fortnight.
18474. Were you never paid otherwise than by the fortnight? If there were anything the matter with the account on any particular Saturday, it might go over until the following Saturday. In some cases it may have gone over for a month.
18475. In those cases, did you give Carter, Gummow, & Co. a receipt for the money? I have given them no receipt for anything.
18476. From whose quarry did you take the 150 yards of condemned stone? I took some of it from Hayes' quarry, some from Meredith and Westbrook's, and some from Ryan's."
18477. *His Honor.*] You say that the whole heap was condemned, and that it was then turned over? Yes.

18478. And that a part of it was finally condemned, and a part of it passed? Yes. The stone was all stacked, to be measured up for the work. When Mr. Millner came along he saw that there were a few bad stones, and he said, "Mac, I will not have that." I said, "I cannot help it. There has been a mistake somewhere. We cannot always be perfect." He said, "Well, I will not have it. It must all be turned over." It was all turned over and inspected, and whatever bad stone there was was put aside. The balance was re-stacked, measured, and passed.
18479. Do you remember how much stone was finally rejected? About five or six loads.
18480. *Mr. Parkes.*] Why was that stone condemned? Because it was not strong enough, I suppose.
18481. Was it soft or hard stone? It was soft, I suppose, or it would not have been condemned.
18482. You say you got the 150 tons from different quarries? Yes. This was a large job. It required about 100 loads of ballast a day, and one quarry could not keep it going. The particular stone to which you referred was brought in by the drays and stacked. It might have come from one quarry or another. I do not know where the few pieces of condemned stone came from.
18483. Were they all passed quarries? Yes.
18484. Will you say from which contracts you drew the cement, and to which contracts you took it? Most of my work was day-work, and when my drays were engaged in that way I sometimes would not know what they were doing. For instance, they would be told to go to North Shore or Marrickville, but what they would be doing I could not always say. I know that some cement was carted from Munni-street to North Shore.
18485. Did you cart it? I did not cart it all. I carted a portion of it.
18486. Can you say when you carted it? I suppose about four years ago.
18487. At what period of the job? I think it was at the start of the job at North Shore.
18488. And at about what part of the Munni-street job? When it was finished, I expect.
18489. How did you take it—by punt? Yes.
18490. How many loads did you take? I could not say; it was day-work. Carter, Gummow, & Co. paid the punt and everything in connection with it.
18491. Do you know where it was delivered at North Sydney? I could not say for a certainty. I was too busy on this side to go over myself.
18492. Are you sure whether it was carted when the Munni-street job was finished, or when it was stopped? I think it was taken from the second portion of the job, but I am not quite certain.
18493. Do you remember what brand of cement it was? No; I do not remember anything about that.
18494. Have you ever carted any cement from Munni-street back to Parbury, Henty, & Co.'s? I have never carried any cement back to Parbury, Henty, & Co.'s. I have carted from their place, but never to it.
18495. You could not recollect how much you did cart, could you? No, I could not.
18496. And you could not tell to what places they took it? No; I know it went to the North Shore job.
18497. You do not know where it was deposited? No. There were three or four different places at which to put it. It was all passed cement, and it was branded.
18498. *His Honor.*] As to the time, do you remember whether it was summer or winter when you carted that cement from the Munni-street job? I think it was in the spring, but I could not say definitely.
18499. *Mr. Gummow.*] How many carts had you in your employ about four or five years ago? About twenty-five.
18500. You did not do all the carting yourself? No.
18501. You did not do it personally? No.
18502. You had a number of horses and carts, and you employed men to do the work? Yes.
18503. Carter, Gummow, & Co. took some of the carts on day-work, did they not? Yes.
18504. And they ordered them where it suited them? Yes.
18505. They did not inform you where the drays were going? No.
18506. They paid you for whatever time the drays were at work? Yes.
18507. So that you could not tell where the drays were employed? No.
18508. Except that you knew that they might be in one suburb or another, you would not know what they were doing? No; not unless the men would tell me on the night before that they had to go to North Shore, for instance.
18509. Even then you would not know to what part of North Shore they were going? No.
18510. You merely kept a record to see what number of hours the drays worked a day? Yes.
18511. You received most of your money from Carter, Gummow, & Co. in cash? Yes; I may have been paid by cheque a couple of times, but that would be all.
18512. You never gave Carter, Gummow, & Co. receipts? No, never.
18513. *Mr. Davis.*] Do you remember the work at Munni-street being suspended? Yes.
18514. When you carted away the cement, was it before or after the suspension? Some was carted away immediately after the work was stopped. I know that the shed at the top of the hill was full. I think some cement was carted away both before and after the suspension.
18515. But the cement you have spoken of—was it carted away before or after? I fancy it was after.
18516. *His Honor.*] Not during the suspension? No, after.
18517. *Mr. Davis.*] You remember that the work was continued from above Mitchell's Road to the foot of Macdonald-street, and that it was then stopped for five or six months? Yes.
18518. Was the cement you carted away after that stoppage? Yes.
18519. *His Honor.*] You mean after the final completion of the whole thing? Yes.
18520. *Mr. Gummow.*] Did you cart any sandstone for the Shea's Creek contract? Yes.
18521. Did you cart any bricks? No.
18522. What I refer to would be clinker bricks, that is bricks which would be used for concrete;—did you cart any of those? No.
18523. The cement-sheds out at Shea's Creek were good large sheds? Yes.
18524. What do you think one of those big sheds would hold? About 5,000 or 6,000 casks—perhaps more. They were very large sheds.

Peter Hart sworn and examined:—

- P. Hart. 18525. *Mr. Gummow.*] What are you? A plumber and gas-fitter.  
 21 Sept., 1896. 18526. Have you ever done any work for Carter, Gummow, & Co.? Yes.  
 18527. Where? Being a local plumber, I have been called on to make necessary repairs to services which may have been broken during the progress of work.  
 18528. Had you a man named George Dawson living with you? Yes.  
 18529. Did you know that he was working for Carter, Gummow, & Co. at that time? Yes.  
 18530. Did you ever hear him speak about the firm? Yes.  
 18531. Will you tell His Honor whether you at any time heard him say anything against the firm, and what you heard him say? He made the assertion at my table that, if, after he had finished at North Shore, the company did not find him employment, he would make it damned "salt" for them; that he would make them sit up. Those were the words he used at my table. It was just after he had come from work, when we were having dinner.  
 18532. Was he living with you? Yes.  
 18533. Where? In Silver-street, Marrickville.  
 18534. Do you know what he referred to in any way;—had you any idea at the time? No; I did not come to any conclusion as to that, but I advised him at the time to be very careful what he did. I told him that he was likely to injure more than himself. He and I had some hot words about it. I thought his talking like that at my table was out of place.  
 18535. Was anyone else besides yourself present? Yes; a man named Charles King and my wife.  
 18536. Did Dawson speak like that on more than one occasion? Repeatedly, and it was always after he had come back from his work—in fact, he was always grumbling about his work after dinner was over.  
 18537. When was this;—can you give us any idea of the date? It must have been at the latter end of September, 1895.  
 18538. Could you give us any idea as to whether Dawson had done anything wrong, or whether he intended to do anything wrong;—how did you take it? I took it that he had some catch laid out to give him a hold on the Company.  
 18539. *His Honor.*] Did you gather what was the reason of his ill-feeling against the Company? No; he and I had some rather hot arguments about it. I told him to be very careful what he was doing. I told him it was not in place for him to take the bread and butter out of his own mouth. I said, "You are earning a livelihood through the Company, and you should keep your mouth shut."  
 18540. When did he first seem to speak in this way—to show any feeling against the Company? All through September. He told me he was idle for about a fortnight; he told me it was through the want of bricks.  
 18541. When he went off at the beginning of the fortnight was he supposed to be dismissed altogether, or was he to be taken on again;—did he know then that he was only off for a time? He was only off for a time, I understood, through the want of bricks to go on with the work.  
 18542. He knew that he was going on? Yes; he was not dismissed.  
 18543. Was it after or before that occurred that he first began to talk in this way? It was after that.  
 18544. Did it seem to rankle in his mind that he had lost a fortnight's pay? I could not say whether he had lost a fortnight's pay or not.  
 18545. He was paid so much a day, I suppose, was he not? Yes.  
 18546. And he did not get paid for that fortnight? That I could not be certain of.  
 18547. At any rate, his suspension seemed to start him grumbling? He was always grumbling more or less about the style of work he had to do.  
 18548. How long before that had he been lodging at your place? About six months before that.  
 18549. And during those five or six months had he shown any signs of grumbling about his work? Yes, he had always a good deal to say about his work.  
 18550. What sort of remarks did he make about his work during that time? He spoke about the dirty, wet, nature of the work.  
 18551. About the kind of work he had to do, you mean? Yes.  
 18552. But during that time did he grumble about the bad way in which the work was done—did he make any comment upon that, or was it merely about the difficult work he had to do? It was about the difficulty of the work. He never gave me a hint about anything else.  
 18553. And when this fortnight's loss of work took place he began to make these threats as to what he could do? Yes.  
 18554. He was taken on to the work again? Yes; and he continued talking about the completion of the job at North Shore.  
 18555. He was then working at North Shore, you say? Yes.  
 18556. How long did he stay with you after that fortnight? Up till Christmas Eve. He left my place at Christmas Eve to get married.  
 18557. Then he was in a better temper, I suppose? He ought to have been.  
 18558. But was he? Very far from it.  
 18559. Was he as cranky as ever up to the last? Yes.  
 18560. Did he pay you for his board and lodging, or did he leave you in debt? He left me in debt.  
 18561. How much did he owe you? At the time he left my house he owed me £2 11s.  
 18562. Has he ever paid you since? He sent me on the 16th and 30th of March two postal notes for 2s. 6d. each.  
 18563. Is that all you have got out of him? Yes; he is now indebted to me to the extent of £2 6s. I think his postal notes are still at home.  
 18564. Did he go on talking about more bad work after that fortnight—did he say anything about putting in more bad work? He never referred to any bad work.  
 18565. He only said that he could make the Company sit up—that he could make it "salt" for them; he did not say why? No.  
 18566. He never said, then, how it was or in what way he could make them sit up? No; since he has given evidence here, and after reading the reports of the proceedings in the *Sydney Morning Herald*, I can see pretty well what it was.

18567. You did not know until you saw it in the newspaper what he meant? No.  
 18568. He never gave you any hint of it? No.  
 18569. You did not ask him? No; I only cautioned him. He was not too well pleased with me for taking the liberty of cautioning him. He was talking very high over it.  
 18570. Was any allusion made in conversation to anything he had read in the newspapers about what was taking place in the Legislative Assembly? He mentioned it once. I remember he said he would go and see Mr. Varney Parkes.  
 18571. What did you say to that? I thought he was talking rather loud, and I did not pay any attention to him. I did not open up any conversation about the matter. He said he did not intend to be always working in the sewers, and that he might get a Government billet through it.  
 18572. You mean through telling something? Yes.

P. Hart]  
 21 Sept., 1896.

Charles King sworn and examined:—

18573. *Mr. Gummow.*] What are you? A labourer.  
 18574. Where are you working now? At North Shore.  
 18575. For whom are you working? For Carter, Gummow, & Co.  
 18576. Did you ever board with Mr. Hart, at Marrickville? Yes.  
 18577. Was Dawson boarding there? Yes.  
 18578. Did you have your meals together? Yes.  
 18579. Did you ever hear Dawson refer to the firm of Carter, Gummow, & Co. in an unkind way? Yes.  
 18580. Will you state what he said? He said that if the company did not find him employment when he had finished at North Shore he would make it damned "soft" for them.  
 18581. Did you know what he meant? No, I did not. All that I know is that he was working for Carter, Gummow, & Co. at the time, and that those were the words he used at the table one night.  
 18582. When was that? About the latter end of this month twelve months ago, as nearly as I can remember.  
 18583. *His Honor.*] You did not ask him what he meant at any time? No.  
 18584. Where were you working at the time? At Marrickville.  
 18585. And Dawson was working for the company at North Shore? Yes.  
 18586. Did it not interest you to find out what he was talking about? No.  
 18587. What sort of temper was he in at the time? It was at the table when he said it. He had been out of work for a while at the time. I did not ask him any questions about it.  
 18588. But there must have been something which set him off talking in that way, was there not? I do not know.  
 18589. Did you hear him say anything like that again, or was that the only time you heard him say it? That was the only time I can be sure of. He said it at the table.  
 18590. How long did you stay at Hart's after that occasion? Up to Christmas.  
 18591. Up to the time that Dawson left? Yes.  
 18592. You say you cannot be sure of any other occasion when he said anything like that? No.  
 18593. Have you any sort of recollection of his saying anything like it again? No.  
 18594. You are sure that that was the only time you heard him say it? Yes.  
 18595. *Mr. Parkes.*] What do you generally work at;—what is the nature of your labour? Anything I am sent to. I am filling trucks now.  
 18596. Did you ever work at mixing concrete? I have turned it over, and I have helped to put it in.  
 18597. Where were you working last? At North Shore.  
 18598. That would be up to the present time? Yes.  
 18599. Did Carter, Gummow, & Co. ask you to give evidence to-day? No.  
 18600. Did you offer to come and give evidence? Yes.  
 18601. *His Honor.*] To whom did you make the offer? I made the statement when a man came to Hart's and asked Hart if anybody else was at the table when Dawson said the thing I have told you of.  
 18602. Hart had told someone of it first? Yes.  
 18603. *Mr. Parkes.*] When did you leave Hart's? About six weeks after Christmas, as nearly as I can remember.  
 18604. In what month was it that Dawson made this statement? This time twelve months ago, as nearly as I can remember.  
 18605. In September of last year? Yes.  
 18606. Where have you mixed concrete? I only helped others to mix it. That was on the Marrickville job.  
 18607. Do you recollect what the proportions were? No, I do not. I had nothing to do with that. I had only just to mix it after it was gauged. I was on the board turning it over.  
 18608. That is all you had to do with it? Yes.  
 18609. Were you working on Contract 77? No.  
 18610. Were you working on the Johnstone's Creek storm-water channel? No.  
 18611. How long have you been working for Carter, Gummow, & Co.? On and off, for five or six years.  
 18612. *Mr. Gummow.*] Did you ever work at Bondi? No.  
 18613. Somebody, you say, called, and saw Mr. Hart;—do you know whether the person to whom you refer was sent to him by Carter, Gummow, & Co.? No.  
 18614. Had he anything to do with Carter, Gummow, & Co.? I do not think so.  
 18615. What was the man's name? I do not know. Hart told me that someone had been there, and that he had told him that I was present, and had heard Dawson make the remark. He asked me if I would sign my name to a paper, stating that I had heard it.  
 18616. Was he a solicitor? I do not know.  
 18617. *His Honor.*] You did not see the man? No.

C. King,  
 21 Sept., 1896.

## Sydney Booth sworn and examined:—

- S. Booth.  
21 Sept., 1896.
18618. *Mr. Gummow.*] What are you? A carter.  
18619. Do you cart for Carter, Gummow, and Co.? Yes.  
18620. What do you usually cart? Anything on the job. Cement, sand, or whatever may be required.  
18621. Is your work day-work? Day-work and piece-work both.  
18622. Did you ever see a man named Dawson on the work at North Shore? Yes.  
18623. Did you ever speak to him? I have had plenty of conversations with him.  
18624. Did he ever say anything against the firm? Yes; he said he would put the company away if they did not give him work at Annandale when he had finished at North Shore.  
18625. When did he say this? Some time when the job was finishing down at Milson's Point.  
18626. This was last year? About the end of last year.  
18627. Did you hear him say that more than once? Yes; on two or three occasions I have heard him say that.  
18628. Did he say that he intended to put the company away if they did not find him work? Yes.  
18629. Did you ever cart any sand from North Shore to Annandale? Yes.  
18630. How much? About 1,700 yards.  
18631. Where did you cart it from? From the Gas Works at North Shore.  
18632. From anywhere else? No.  
18633. *Mr. Parkes.*] You carted sand to North Shore from Mossman's Bay, did you not? No.  
18634. Was there any cartage from Mossman's Bay to Carter, Gummow, and Co.'s job at North Shore? There was sand carted, but I carted none.  
18635. Who carted it? There were different carters.  
18636. Was any carted by Burcombe? Yes; he carted some.  
18637. A great quantity was carted from there, was it not? I cannot say what quantity. I was on day-work at the time.  
18638. Did not the Mossman's Bay Council kick up a row about the cutting up of their streets by this carting? I could not say.  
18639. Burcombe, you say, carted a lot of sand from that place? Yes, and Webb.  
18640. Did you cart any cement from the Munni-street contract to North Sydney? No; not from Shea's Creek. I carted it from different jobs backwards and forwards—that is, from one job to another. I carted some from North Shore to Marrickville, and from Marrickville back to the Shore—also to Annandale from the Shore.  
18641. Did you cart any cement from the Annandale to the Marrickville job? No.  
18642. But you carted some from the North Shore job to Marrickville? Yes.  
18643. At different periods? Yes.  
18644. Did you ever do any carting for Parbury, Henty, & Co.? No.  
18645. How much would you take to the load—twelve barrels? I only took five at a load. I had a single horse.  
18646. Did you ever cart any cement to other contracts? No.  
18647. You only carted it between Marrickville, North Shore, and Annandale? Yes, and also in connection with the Milson's Point job.  
18648. How much did you cart? I could not say.  
18649. The Milson's Point job would be 79A? Yes.  
18650. You only carted it in connection with these particular contracts? That is all.  
18651. *His Honor.*] What was the sand carted from Mossman's Bay;—was it sand obtained on the spot, was it sand landed there, or what was it? I could not say. I think it was beach sand. I fancy it was.  
18652. *Mr. Davis.*] Was it not Balmoral Beach that the sand was carted from? Yes.  
18653. *Mr. Parkes.*] Was the sand not carted from Mossman's Bay itself? Not that I know of.  
18654. Did they not come down past the Rangers on to Mossman's Bay and take the sand away? I do not know. I never carted sand from there.  
18655. *His Honor.*] When you spoke of Mossman's Bay in reply to Mr. Parkes, you meant Balmoral? Yes. It is all under the one Council.  
18656. The sand was taken from the beach? Yes; as far as I know.

## John Carter re-called and further examined:—

- J. Carter.  
21 Sept., 1896.
18657. *Mr. Parkes.*] Was not sand carted from Mossman's Bay Beach to Contract 79? No, it was carted from Balmoral. There is no beach at Mossman's Bay. I do not think there is any sand there.  
18658. Did you not have a dispute with the Municipal Council of Mossman's Bay? Yes; I agreed with the Mossman's Bay Council to cart as much sand as I wished from Balmoral Beach, and to give them a certain number of yards of ballast in exchange. While the carting was going on the roads were being cut up—the Balmoral Beach road was especially cut up by the heavy traffic of our four-horse drays, and one or two of the residents complained. They also complained of the destruction of the foreshores by our digging of the sand out of the beach. After some correspondence and some personal interviews with the Mossman's Bay Council, we ceased carting from there. That is the history of that transaction as far as I can remember it.  
18659. *His Honor.*] What was the sand for? For concrete. We were working under the old specification under which we were allowed to use the Bourke-street drift sand.  
18660. Would not the sand you took from Balmoral contain sea salt? That is no detriment to underground work.  
18661. Not to concrete work? No.  
18662. But you would not be allowed to use it for mortar in buildings? No. There is always a certain amount of sweating in the sewer itself. I presume therefore that the department did not on that account object to the use of the sand.  
18663. The Balmoral Beach sand would be good sharp sand, I suppose? Yes; better sand than Bourke-street sand, and Bourke-street sand was provided for in our specification.  
18664. *Mr. Gummow.*] You had not to use Nepean sand? No.

18665. The sand was not specified to be equal to Nepean sand at that time? No. There was nothing in the old specification on that subject.

18666. With regard to Contract 69, do you know what the specification of that contract said in regard to sand;—was it the same as the specification for Contract 79? No; it was a new specification. It referred to Nepean or good quartz sand—I forget the exact words—equal to Nepean sand.

18667. Did you use any Nepean sand upon Contract 69? We started with Nepean sand.

18668. Whom were you getting it from? From the Emu Gravel Company.

18669. From any one else? We got some from Mr. T. R. Smith, brother of the present Secretary for Mines. There was jealousy or something of that sort on the part of the Emu Gravel Company, so far as Mr. T. R. Smith's sand was concerned, and the company wired down to the office stating that we were using inferior sand obtained from Mr. Smith. Not to put it too mildly, the company got their back up about it. I decided that we would not use any of the Nepean sand. We then bought a crusher and started crushing at once on our own account.

18670. Did you try to get the sand somewhere else in the first instance? Yes.

18671. Do you know from hearsay whether the Emu Gravel Company bought out Mr. T. R. Smith? I believe they did afterwards.

18672. Thereby creating a monopoly in Nepean sand? Yes.

18673. Did you go down the Illawarra line looking for sand? Yes; I went down to Shellharbour, and we spent a lot of time and money over it. One or two trial trucks were sent up, and it was scarcely good enough. It was a little bit dirty.

18674. What did you do then? We purchased a crusher and set to work on our own account.

18675. To crush sandstone? Yes.

18676. And the sand that you crushed from the crusher passed the test? Yes; it passed a good test, and we used no more Nepean sand.

18677. When you completed Contract 69 you removed the crusher to Contract 118? Yes.

18678. And you crushed stone there? Yes.

18679. And the sand from that stone passed the test? Yes; it all passed the test. The sand was used in the stormwater sewer.

18680. Was any used on Contract 77, do you know? No. The sand which we crushed was used upon contract 118.

18681. In regard to Contract 118, do you know anything about the top-cutting of that drain? Yes; I know the circumstances that brought it about. It was pointed out to me by Mr. Snodgrass that we were suffering a very great hardship from having the Harbour and Rivers Department pumping up sand and mud all over the site of our works. He advised me to go and see the proper authorities about it. We were entitled to a low-water mark, as well as to a high-water mark. I saw Mr. Davis and also Mr. Hickson in the matter. It was rather an urgent one, and they went out and inspected the site, and took immediate action. The result was the cutting of the drain. We bore a portion of the cost in order to expedite matters. We undertook to put in the necessary flood-gates. We had the necessary plant there; and the department had none. We therefore put in the flood-gate at the outlet of the temporary drain at our own expense.

18682. *His Honor.*] You mean close to the retaining wall? Yes; near the little Rozelle Bay wharf.

18683. *Mr. Gummow.*] Have you noticed that drain lately? Yes; I was there the other day.

18684. Is it in use now? Yes.

18685. Is it necessary now for Carter, Gummow, & Co.'s contract? No.

18686. It is simply used by the Government themselves? Yes; to carry off the reclamation water—to carry off the water which comes down the old channel, and also the new channel at Johnstone's Creek. I see they have punched a hole through the storm-water drain, and have diverted it into the temporary channel.

18687. Do you know anything about the ballast which was brought on to Contract 118;—did you take particular notice of it? I took an interest in it at first, while the dispute with the neighbouring quarries was going on.

18688. Did you know at the time why McMillan carted from Ryan's quarry;—had you anything to do with the question at that time? Yes, I had.

18689. Why did he go to Ryan's quarry? Because of the ring formed by the local quarrymen. It was somewhat on a par with that business of the Emu Gravel Company. We determined we would not be imposed upon. I was quite prepared myself to pay even two shillings more, getting the sand from North Shore, than to deal with these people.

18690. In other words, you would not be put upon by them? No. They quoted to us a certain price before we tendered, and they afterwards raised it.

18691. As to Contract 53, the Waverley contract, you were one of the contractors for that job? Yes.

18692. Do you remember going to Double Bay Valley and seeing the concrete arches which were built there by your firm? Yes; I was there on many occasions in those days. I used to visit the works more frequently than I do now, and I saw these arches in course of construction. I also saw the culvert being built. I knew when I heard Mr. Bagge endeavouring to locate the spot where the supposed damage had occurred upon this work that he was referring to the culvert. It was the culvert which was injured, not the arches. The collapse or partial collapse of the culvert was due to the faulty foundation of one end of it. It was replaced by us at the department's expense.

18693. As to Contract 72—do you remember the stoppage of the work at Macdonald-street? Yes, at the foot of Macdonald-street.

18694. You put in a claim in connection with that contract? Yes.

18695. Did you make out the claim? No. I gave Mr. B. C. Simpson the particulars, and upon them he based the claim.

18696. You yourself did not make up the claim at all? No.

18697. You left it all to Mr. Simpson? I left it entirely to Mr. Simpson. He is a consulting engineer and an arbitrator. In the circumstances I naturally went to a man of well-known standing and ability.

18698. Do you know whether there was much cement on the ground when the work was stopped? Yes; I know that the sheds were what we call running over with cement.

18699. Do you know if any cement was carted from that contract on to other contracts? Yes; it was carted here and there. Some went to North Shore.

18700.

- J. Carter. 18700. As to Contract 65 at the Glebe, you took it over from some other firm of contractors? Yes. We took it over from Cowdery and McLean. They had a badly arranged schedule.
- 21 Sept., 1896. 18701. What do you mean by that? They started to lose money from the jump. They had had very little experience in sewerage work.
18702. And you took the contract over from them? Yes.
18703. Did you make it pay? No; we lost money.
18704. Do you know anything about the making up of schedules? Very little; that is not my part of the business.
18705. As to Contract 77;—do you remember when you first saw the plans of the Monier design? No, I do not; I saw them before the tenders went in. I saw them on several occasions. I could not say when I first saw them.
18706. Did you go to Mr. Hickson before you put in your tender for that contract and ask him to look into the matter, and to give you the contract? No.
18707. Did you go to the Minister? Yes; I went to Mr. Young, and I told him that we proposed putting in a separate tender, and I asked him if it would be allowed. His reply was, as far as I remember it, "Put it in and let it take its chance."
18708. What reason had you for going to him? Because we did not want the plan to be thrown out unconsidered. I had to hand the plan in to someone. It could not go into the tender-box.
18709. To whom did you hand it? To Mr. McLachlan, the chief clerk.
18710. Did you see Mr. Barling? Yes. I asked Mr. Barling what was to be done with it, and he said I had better hand it to Mr. McLachlan.
18711. Were you at Mr. Barling's office before 11 o'clock? Yes.
18712. Did he say you had no business to be there before 11 o'clock? Yes; he treated me to a sort of lecture on the subject, and I explained to him that it was necessary to come before 11 o'clock as tenders were called for at 11. I saw Mr. Barling a little later on and he expressed his regret, if I may so term it, that he had spoken so sharply to me a few days previously. He did not seem to quite understand the circumstances.
18713. So then what really did occur when the plans were put in is strongly rooted in your mind? Quite so.
18714. It was not put in after the other tenders were put in? No; the tender was put into the box accompanying the plan which I handed to Mr. McLachlan a few minutes before 11 o'clock on the day of tendering.
18715. Have you any idea when we got the Monier plan? Yes.
18716. How many days before the tender went in? I think—in fact I know—that we got it on the morning of the day on which the tender did go in.
18717. From Mr. Baltzer? Yes.
18718. He had it ready before that? It was partially ready. It was pencilled out and all the strains and stresses were taken out. I know, however, that we had to rush him to finish it so that it might go in in a presentable form.
18719. You do not think it was ready on the day before the tenders went in? I am sure it was not—not the plan in its present finished state.
18720. Do you remember the firm putting in a tender on the Government design? Yes.
18721. We were the lowest tenderers upon that design? Yes.
18722. Had you any idea of taking up the work if the Department had accepted the tender? There was no alternative, as far as we were concerned. We never make a practice of backing down, in the first place, and in the second place we could have carried out the work without any loss. We should not have made any profit upon it, but there would not have been any loss.
18723. What was your idea of tendering in that way without any prospect of profit on the Government designs? It was simply in order that we might be the lowest tenderers.
18724. But what benefit was it to you to be the lowest tenderers;—where did the profit come in? In using up our plant, and in finding employment for all sorts of odds and ends which were lying about idle.
18725. What was your primary object in putting in a tender at cost price? In order that we might, if possible, be the lowest tenderers.
18726. Did you consider that if you were not the lowest tenderers for the Government design the Government probably would not look at the Monier design? We thought so.
18727. That point was considered? Yes; we determined to be the lowest tenderers, if possible, in each instance.
18728. And if the Department had accepted your tender upon the Government design you would have gone on with the work? Certainly; no alternative ever presented itself to us. We were fully prepared to carry out the work.
18729. You consider that having put in a tender you are morally bound to go on with the work unless some gross error has been made? Yes.
18730. You have always acted in that spirit? Yes.
18731. It is not usual for you to throw up a contract because your tender has been a bit too low;—you always go through with the work? Yes.
18732. You have not made money on some of your contracts? We lost heavily on the Waverley contract and on Contract 65. Some of our contracts have come out pretty near the mark. On others we have made a little profit. Others, again, have returned a fairly good profit.
18733. Did you make any profit on Contract 79, at North Shore? Yes; a good profit.
18734. As to Contract 79, you bought off Bond and Hudson? Yes.
18735. Had you any reason for doing that? I had several reasons; the idea originated with me in the first instance. We were very sore that a firm who had already thrown up a good contract which might have gone to someone else should also have come in on Contract 79.
18736. Did you get the one they first threw up? Yes; on open tender. We were always anxious to get the North Shore contract, having a lot of plant and machinery—hoisting engines, air-blowing plant, fans, pipes, and all sorts of things—about £3,000 or £4,000 worth altogether. We had also a large stock of cement coming forward, which we had bought in anticipation of our being allowed to use it on the Munnistreet sewer. We always thought that Bond and Hudson would lose money if they went on with the job,



job, and we were fairly confident that we could make something out of it. On these grounds I made a proposition to Mr. Bond after some considerable time had elapsed, and there was no sign of the Department accepting their tender, that they should withdraw, when we would take our chance of getting the work.

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18737. Do you know why the Department would not accept Bond and Hudson's tender at the time? No; I have no idea of it. I may have had an inkling of it.

18738. You had nothing to do with their tender not being accepted? Not the slightest thing.

18739. Do you remember a joint letter being sent in—a letter of protest by Carter & Co., and by Gummow and Gillan? Yes.

18740. Why did Gummow and Gillan join in the protest? Because you were the lowest tenderers for the Woolloomooloo job—I forget the number of the contract—which Bond and Hudson abandoned. The work was re-tendered for, and we got it, beating Gummow and Gillan.

18741. Were not Bond and Hudson the lowest tenderers, and Gummow and Gillan second? Yes.

18742. Did not Bond and Hudson throw up the work? Yes.

18743. The Department did not give it to Gummow and Gillan? No; it was re-tendered.

18744. When Carter & Co. beat Gummow and Gillan? Yes.

18745. Did you approach me on the subject of this letter of protest? I believe so.

18746. On what grounds? You were the aggrieved party in the first instance, and we thought that you should stand in with us in any action of the sort. There was a good deal of what I might term fishing tendering going on at that time. People were tendering with the object of seeing what Carter & Co.'s and Gummow and Gillan's prices were. If their own prices were anywhere near the prices of those two firms, they generally considered it good enough to go on with the work. If not, they used to try to get out of it. We objected to that sort of thing. That was the reason for our joint protest.

18747. All the tenders were posted up so that everyone could see them? Certainly.

18748. And the firm of Gummow and Gillan were very sore over the abandoned contract not being given to them? Yes.

18749. It was owing to that that you asked them to join in a protest against the firm who had upset them before? Yes.

18750. And they agreed to that? Yes.

18751. Have you anything further to say on the question of the settlement you made with Bond and Hudson? Well, I might explain what I did. I represented to Mr. Bond—and I represented it truthfully, as far as I know—that he was bound to lose money upon his tender, and that we could make money out of the work. We had a long discussion. Mr. Bond did not seem very anxious to go on. He was an old man, and he was not accustomed to the work. We finally agreed to the terms and conditions which have already been referred to in the evidence, to the effect that I was to pay him £750 cash down, job or no job, taking the risk. If our tender was accepted he was to get a further sum of £750.

18752. You did not know at the time you paid him the £750 that you were going to get the job? I had not the slightest idea.

18753. It was a speculation on your part? Yes; I plunged upon it.

18754. As to Contract 79A—how did you manage to get that;—did Mr. Hickson help you in any way? I did not see Mr. Hickson on the subject at all; I saw Mr. Young. It was the outcome of a conversation which some of the men had with Mr. Clarke in the first instance. As far as I can remember, they represented that work was getting scarce at North Shore, and that he should endeavour to have some of the sewerage work pressed on. I think the sewerage farm was the contract which was referred to first.

18755. Who was the Minister at the time? Mr. Lyne.

18756. You know nothing further about the contract matter than that you got the contract at Government schedule rates? Yes; of course we put in a price which was above the Government estimate; and Mr. Lyne, in the course of an interview I had with him, refused to deal on our lines. I think the suggestion came from him—I am almost sure it did—that if we were prepared to carry out the work upon the Department's estimate he was prepared to let it to us. I consulted with Mr. Snodgrass, who was then in Sydney, you being away in Adelaide; and after a good deal of hesitation and argument—for we considered that the Department's estimate was a very low one—we decided to accept the offer, having gone so far in the matter. It was more with the idea of keeping our plant and men together. Our office expenses and everything else were going on, and we took the work rather with that idea in our heads than with any other motive.

18757. You did not consider, then, that it was a very valuable job? Not by any means.

18758. It was not a 5 per cent. better job than the job Butcher Bros. got over there? No, nothing like it.

18759. As to Mr. Snodgrass—did he interview the Minister with you? I do not think so; I do not remember it.

18760. Did he interview Mr. Young, the Minister, at the time you went in to see him as to the Monier plan being put in? Yes; he did, I think.

18761. If Mr. Snodgrass did not, could he know anything about what the Minister said, except from you or myself? Certainly not.

18762. As to Mr. Snodgrass's power in the firm—had he any power or say in actually settling whether we would take up a job or whether we would not? No; except that he was consulted as a matter of courtesy.

18763. As a rule, who were left to judge in any question affecting the general business of the firm? It was left to you and myself. It was left to me before we joined. When the two firms amalgamated those sorts of questions were left to you and to myself jointly.

18764. So that we could deal with all important matters ourselves? Undoubtedly.

18765. Probably consulting the other partners? Sometimes.

18766. But if we did not consult them, we acted on their behalf? That is exactly so.

18767. They always agreed to our action? Yes.

18768. When you put in this Monier plan, was there any idea of sureties being required? No.

18769. Was any schedule put in with it? No; it was a lump sum tender.

18770. Do you remember after the tender was dealt with that the question of sureties arose? I do.

18771. Whom did you go to see on the question? Mr. Hickson.

18772. Did you protest against sureties being required at the time? Yes.

18773.

- J. Carter.  
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18772. What reasons had you for protesting? I thought that Mr. Hickson was treating us very harshly indeed in the matter, that he was, in fact, trying to impose such obligations and restrictions that it would be almost an impossibility for us to comply with them. I thought it was ridiculous to ask for £24,000 of security in respect of a piece of work which could not cost more than £7,000 or £8,000 to replace if it all collapsed.
18773. Was it not considered between us that if a contract like that was passed by the Tender Board the mere fact of their accepting it should have been a sufficient guarantee as to the stability of the work? Undoubtedly; we discussed the matter very fully.
18774. The matter of £12,000 was a very small matter compared with the reputation of the gentlemen composing the Tender Board? Undoubtedly; that was our argument. They had officially recognised the system. The plans we submitted were all that could be required, and we thought that quite sufficient. We thought that Mr. Hickson was going beyond the point to which he should have gone.
18775. He made you put up a deposit as well? Yes, a cash deposit.
18776. And he also wanted retention money? Yes.
18777. How much did they amount to? £1,500.
18778. So you do not consider that Mr. Hickson had extended any concession to the firm as regards the Monier contract? I certainly do not; it was the reverse.
18779. Then, again, the amount of sureties were put down at £12,000? Yes.
18780. Was that a fair amount to put upon the work, do you consider? No, it was an excessive amount. I think we once estimated the proper amount at about £8,000.
18781. You were so satisfied with the plans that you did not object? Not in the least. I did not mind then, having gone so far in the matter.
18782. You did not mind their forcing you to find securities? I did not mind whether the amount was £8,000 or £12,000; it was the principle of the thing that I objected to.
18783. Is there any other point in connection with that matter upon which you wish to say anything? No; I do not think so.
18784. Have you had anything to do with contracts in any other colony? Yes; in Tasmania.
18785. What did you do there? I was manager and shareholder in the construction of the Brighton to Apsley railway, 26 miles.
18786. What sized contract was that? It came to £100,000, I suppose, by the time it was finished.
18787. Did you get any advance on material on that contract? Yes; we received an advance on the ballast in the pit and on the sleepers which were all over the ground.
18788. On the contract? No; they were stacked in all directions. They were actually the property of the Government, but we adzed and bored them. We practically, therefore, received an advance upon labour. We received an advance on fencing material, bridge timber, or whatever might be lying about.
18789. Do you know whether that is the usual custom in Tasmania upon Government contracts? Yes; I do not think there has ever been any difficulty in the matter.
18790. Was the schedule of quantities adhered to? No. After we had signed the contract they altered the width of the line, and the direction in one or two instances was also altered—in one case by 20 or 30 feet. They began to pick and choose among the items, picking out the cheap ones and leaving us the others.
18791. You went on with the work just the same? Yes. We had to go on. I remember that in one instance they shifted a cutting 20 feet. It ran through river sand. There were about 200 or 300 yards of it, and they shifted us into about 12,000 or 15,000 yards of bluestone, and paid us the 1s. a yard which we were to have for the sand.
18792. What was the upshot of the whole thing? The matter went to arbitration.
18793. And how did it come out? It came out all right for the contractors. The award was decidedly against the Government for interference with the schedule. We received £32,000 under arbitration for alterations in the line, and for defective and misleading prices, and so on.
18794. I suppose you consider that if the Public Works Department of this Colony treated you in the same way you would have a similar cause for complaint? Undoubtedly. I think it is a very dangerous thing to interfere with a contract after it has been signed.
18795. Did you ever get a contract here in which your tender was accepted, and in which the work was not carried out? Yes, at Milson's Point; the present site of the Milson's Point railway station.
18796. What was the contract? It was practically the carrying out of the work as it now stands, with the exception of the station building. It was the removal of a large mass of rock, the building of the retaining wall, and so on.
18797. Was your tender accepted for that? Yes.
18798. And the work was then stopped? Yes; we never touched it, in fact.
18799. Did you get any compensation? Yes; ten per cent. on the amount of the tender.
18800. What was that? £6000. We got £600 compensation.
18801. From whom? The Railway Department.
18802. Was that done under the Minister? Yes; under Mr. Goodchap and the Minister.
18803. Who was the Minister? Mr. Sutherland.
18804. Were you ever engaged upon any contract in New South Wales which was stopped during progress? Yes; the Castlereagh-street sewer.
18805. What happened there? The contract was let in the ordinary way, providing for excavation by blasting, and after it had been in progress for some little time the property-owners along the site of the works objected very strongly. I think the then Governor of the Colony, Lord Carrington, objected to it. We were working down here, close to the Government House gates. The work was stopped by the Department pending a settlement as to the method by which it should be carried out.
18806. Was it stopped by an injunction of the Supreme Court? I fancy so; but I could not be quite sure. An injunction was applied for, I think. I fancy that Mr. Alex. Dean was one of the applicants. At any rate, the work was stopped pending settlement as to the method in which it should be carried out. If I remember rightly, guttering and gadding was first introduced upon that contract.
18807. What was the upshot of the matter as far as you were concerned? We were paid compensation. Our plant was taken over at a valuation, and the contract was re-tendered.
18808. Do you know who got it? Gummow and Gillan.
18809. You had nothing to do with it? No.

18810. Do you know whether they cut the work out from start to finish? I believe so.
18811. Upon the question of guttering and gadding, are you still as strong as you were in your belief as to the risk attaching to the men's lives? Yes; I have always taken a strong view of that matter. I have always taken a keen interest in the question, and I still maintain that I am right.
18812. As to the question of your generosity—you seem to have been generously inclined to two or three individuals. Is it usual for you to assist persons and to lend them money without charging any interest? Yes.
18813. Can you give any instances in which you have done so? I should prefer not to.
18814. *His Honor.*] But without giving names—you might leave the names out? Unfortunately or not for myself, as the case may be, I have done a good deal as to that sort of thing.
18815. *Mr. Gummow.*] Will you give the amounts? I once lent the sum of £600.
18816. Have you had it back? No.
18817. Had you anything to show for the £600 when you lent it? No.
18818. Did you get anything afterwards? Yes; I got a bill of sale. I found the man was playing a shifty game with me. I could not stand that, and I woke him up about it.
18819. Was he a personal friend of yours? No; I knew him casually in business; in fact, he was a building contractor. I assisted him with money to carry out one or two small contracts, but I found that he was shifty. I thought that he was not acting squarely and honestly as he should have done. I objected to that, and obtained a bill of sale over his household effects.
18820. What happened to the man? He died; he was killed.
18821. Did he repay you the money? No.
18822. Did you enforce your bill of sale? No.
18823. What did you do with it? I gave it to his wife, and she started a boarding-house with the furniture; that was the end of the matter as far as I was concerned.
18824. Can you name any other instances where you have lent or given over £100 to any persons without any security? Yes. I paid up considerably over £100 to a young fellow I knew at North Shore. I had known him for about twelve months. He had been making too free with the funds of the institution with which he was connected. I took an interest in him and paid up the amount of his embezzlement rather than he should get into trouble. I determined to pay up the money for him and give him another chance.
18825. Did you ever receive any of it back? No.
18826. Was he anything to you more than a fellow citizen? No, very little more. He had been inside my house three or four times. He had seen better days, although he was a young man, and I took a little interest in him.
18827. There are other amounts you have lent to different persons, are there not? Yes, but I do not know that I need particularise them.
18828. Is there anything you desire to say to his Honor; any statement you wish to make in regard to any contracts I have not referred to? No, I do not think so.
18829. You are not given to drink, as has been stated by a witness here? No; I was a teetotaller until I was 35, and I am next door to a teetotaller now. As to Wright's matter—if that is what you refer to—I might say at once that there is absolutely no truth in the statement he made. I should also like to say that I had the personal supervision of the North Shore contract, concerning which Wright gave evidence; in fact I should like to say that, so far as I know, all the statements made by the witness Wright, so far as Mr. Forrest's behaviour is concerned, were, to say the least of them, incorrect. Mr. Forrest is a steady, sober, man in every sense of the word. I saw him every day on that contract, and I know that he has never been the worse for liquor in his life. As to his gambling or supposed gambling with the inspectors I am sure there is absolutely no truth in that statement. Mr. Forrest is not a man of that kind.
18830. *Mr. Davis.*] When you put in your tender for Contract 77, the lump sum tender for £15,500, did you make an estimate of the cost of the work in arriving at that sum? I did not; but Mr. Gummow did. I never interfere with estimates. If Mr. Gummow is satisfied, I am satisfied.
18831. I think you said you handed in your plan to Mr. McLachlan, as chief clerk? Yes.
18832. Did you also know that he was Secretary to the Tender Board? Yes; although that did not occur to me at the time. I simply carried out Mr. Barling's instruction, if I may term it so.
18833. As to the practice of testing cement, up to a certain date was it not the custom of the department to require the contractor to cart on to any particular contract a good large parcel of cement—sufficient to last on the contract in question for fourteen days, and then to test it from the contractor's shed? Yes.
18834. That was the practice up to a certain time? Yes.
18835. Then some difficulty arose with regard to the passing of the cement; a large quantity of it was being imported by the merchants which failed to pass the test? Yes.
18836. Did they not complain that they considered they were put to a lot of unnecessary expense and trouble in carting the cement from the ship's side to the contracts, and then having in many cases to cart it back again in consequence of the cement not passing the test? Yes; there was a great deal of friction between the merchants and the department. There was very sore feeling on the part of the merchants against the department at the time. I remember that they held a meeting at which we as contractors were particularly invited to express our views on the subject. A number of alternatives were suggested, and I think the course which is adopted now has satisfied most of them.
18837. What was the resolution which was adopted? The putting of the cement in bond, if the merchants so desired it, and having it tested and branded, and then issued as the merchants required.
18838. So that the cement tested in bond and branded there before it left the stores might be carted to half a dozen contracts? Certainly; it is carted here, there, and everywhere, as far as I know.
18839. It would not be tested on the ground? Undoubtedly not.
18840. As to these stocks of cement you had on various contracts at the beginning of 1892, were they large? Yes; very large.
18841. Have you any notion as to how many casks of cement you had in stock at that date? No; I could not say definitely, but I should think there would be anything up to 6,000 casks. We always endeavoured to have our sheds fairly well filled. We have never been people who desired to have our works stopped through insufficiency of material.
18842. You have said in your evidence, I think, that you had at that time particularly heavy stocks? Yes; we had stocks in hand, and there were large orders to arrive. They were arriving every day, in fact.
- 18843.

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18843. In regard to Contract 72, when Mr. B. C. Simpson put in your claim for the stoppage of the work, one item in it was for cement that you had in hand, amounting to how many casks? Two thousand untested, and 1,300 tested.
18844. That cement must have been in stock? Undoubtedly. At the end of 1891, or at the beginning of 1892, when that claim was made out, that cement was in stock. There may have been more.
18845. Do you remember asking that the 2,000 casks of untested cement might be subjected to the Departmental test? Yes; it is always better to have it tested, because you can then sell it.
18846. Was it tested by the Department eventually? Eventually.
18847. But not at that time? No.
18848. In making out your tenders what have you reckoned that a cask of cement will make in the case of bluestone concrete and sandstone concrete? I do not know from my personal knowledge, but I have often heard it discussed. I have been present on many occasions when tenders have been made out. I do not know from my actual experience and observation what it will make, but we have always taken it that in the case of sandstone concrete a cask of cement will make a yard, or up to 30 feet. We generally take it as a yard for estimating purposes.
18849. And what do you estimate that it makes in the case of bluestone concrete? From 22 to 23 feet.
18850. I suppose you would say that the circumstances under which the concrete is used, and the quantity of water used in it, would have to be taken into consideration in estimating what a cask would make? Yes; I know very little about it. I have taken a certain amount of interest in the matter, but that is all.
18851. I cannot ask you to say how many concessions you have had from the Department, but I will ask you whether you regard the action of the Department in respect to the substitution of guttering and gadding, or the proposed substitution of guttering and gadding, for blasting, as a concession? No; I regard it as a direct wrong. I was particularly sore upon that point at the time. When you, as I thought, attempted to use the specification and schedule in direct opposition to all sense of equity and right dealing, I was angry about it.
18852. But could you blame the Department, or did you blame them for making use of the prices you have given? I did.
18853. You said in your schedule that you were prepared to do work of a certain description for a certain price, and that you were prepared to do work of another description for another price. Could you blame the Department, seeing that they had power under the contract to do so, for electing to do the work in the cheapest way? Yes; I still blame the Department, and I say that you made use of your specification to attempt to carry out work in a manner in which it was never intended that it should be carried out. There was a lot of evidence that you never intended to carry out the North Shore contract, and that, I suppose, is the particular one to which you refer, by guttering and gadding. This consisted, among other things, of the length of time allowed for the completion of the work. We always considered that the item of guttering and gadding, if it were set down in the schedule, was to be applied to isolated lengths where that work was rendered necessary through the proximity of buildings, the existence of any illness in the district, or anything of that kind.
18854. Did you not recognise the right of the Department to do what they proposed to do by virtually allowing a sum of £1,300 to be deducted from your final certificate? If you like to look at it in that way you may do so. I do not take that view of the matter. It was a question of expediency with us. We did what is generally known as splitting the difference.
18855. I wish now to refer you to Mr. Maddison's evidence. He gave the following evidence in reply to question 3406:—

Will you tell His Honor what it was? It amounted to this—that Mr. Hickson, jun., had been retrenched out of the Department, and that Mr. Hickson, sen., wished to find him employment of some sort, and had asked Mr. Carter if he could find anything for him to do, or whether they would take him in as a member of the firm. The reply which I understood Mr. Carter made to that request was that Mr. Hickson, jun., could not be taken into the firm within five or six years.

What have you to say as to that;—the conversation is said to have occurred near the Bank of New Zealand, in Sydney? So far as any conversation with me, or the locality of any conversation with me goes, Maddison's statement is practically correct. I did meet him near the Bank of New Zealand, in Spring-street, one morning in company with Mr. Ewing, as far as I remember. After some casual remarks, one of them said, "I hear you have got another partner," or words to that effect. "Really," I said, "I do not think so. I know nothing about it. What do you mean?" One of them said, "I hear you have taken in young Hickson." I said, "That is quite incorrect"; and, if I remember rightly, I pointed out that such a course of action would have been impossible for me to take upon my own responsibility. I pointed out that there were seven members of the firm, or syndicate, or whatever you like to call it, and that that was quite sufficient for whom to obtain contracts without taking in an additional number. I think I explained to them that young Mr. Hickson had gone down to Adelaide to fulfil certain duties. I dare say I did. That was the end of the matter, as far as I know.

856. Did you observe what Mr. Maddison said as to what you told Mr. Hickson, senr.;—that you told Mr. Hickson, senr., that Mr. Hickson, jun., could not be taken into the firm within five or six years. That is what Mr. Maddison says; and Mr. Ewing, at question 3281, says:—

What did Mr. Carter tell you? Mr. Maddison asked Mr. Carter if it were true that Mr. Hickson, jun., had been engaged by the firm, and Mr. Carter said "Yes." Mr. Hickson, he said, wanted to join the firm, but he had told him that he had better wait two or three years.

? There is some misconception over that matter as far as Mr. Maddison and Mr. Ewing are concerned. I believe they are quite honest in their impression of the conversation, but they have an erroneous impression. I did not say anything of that kind at all. I always looked upon Mr. Hickson, junior, as a young man who wanted experience. It does not do to take an inexperienced man into a firm of contractors. Most of us have served some kind of apprenticeship, and some of us a long apprenticeship. Every man who is taken in has to do his share in some shape or form, and Mr. Hickson, junior, would have been utterly useless as a partner. It would have been a mistake to take in anyone like that as a partner, seeing that we could get his services for £4 a week. Men like Mr. Snodgrass and Mr. Gummow are indispensable members of a firm like ours, and would be taken in by anyone under almost any circumstances, but a young man like Mr. Hickson would be only of use to a limited extent in the matter of survey work and alignment,—otherwise he would have been an incubus.

WEDNESDAY, 23 SEPTEMBER, 1896.

Joseph Davis, recalled and further examined :—

18857. *Mr. Parkes.*] As to Contract No. 79, the advance on 900 casks of cement shown on certificate No. 13, under date of 27th April, 1893, would be the first advance made on cement upon the contract, would it not? I should have to refer to the vouchers. I could not speak from memory. Mr. Christie gave a list of the advances made in some of his evidence. I do not think it is incorrect. J. Davis.  
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18858. You think it is correct? I believe it is.

18859. You think, then, the advance I have given you would be the first advance? Probably.

18860. Can you produce Ministerial authority for the advance? You will see upon page 317 of the Parliamentary return a memorandum of agreement drawn up on the 3rd August, 1893.

18861. Is that not the only one which was drawn up in connection with that contract in reference to advances? I believe it was; I could not speak positively; but to the best of my belief—yes.

18962. Then, for the advances prior to that there was no Ministerial authority? What was the date of the first advance?

18963. The 27th April, 1893, as shown by your certificates? There does not appear to be any Ministerial approval of any advance as far as I can see from the papers. It seems that the difference between the advance to which you refer and the advance made after the 3rd August, 1893, was this: that we had a memo. of agreement in the latter case and not in the former; and, if the 900 casks of cement were stored upon the works, this agreement would be scarcely necessary. The agreement in question was taken more especially in regard to cement that could not be technically regarded as on the site of the works. The general conditions give us full control over any material and plant on the site of the works, so that the agreement in that case is not necessary.

18864. Then it would not be necessary in any case? Unless the cement or other material happened to be off the site of the works. In that case it would be.

18865. Suppose the 900 casks were stored at Grant's Wharf? I do not think, in the case of Contract 79, any was stored at Grant's Wharf. To the best of my belief it was not.

18866. Are you sure it was not? I am not positive, but I think that Grant's Wharf was used in respect of Contract 79 A.

18867. *His Honor.*] Where is Grant's Wharf? Near Milson's Point. I know that the contractors had large sheds before any cement was delivered on to Contract 79, and I presume the first advance made on cement would be in respect of the cement in those sheds. It happened a long time ago, and I could not possibly remember the details.

18868. But no Ministerial authority was ever obtained for any of these advances, was it? Not in every case. It was such a usual thing.

18869. Is there any one of these cases in which it was obtained? I do not remember any case.

18870. Can you produce a case in which Ministerial authority was obtained? No; I think the advance was regarded as being covered by the contract.

18871. No special authority was ever asked for? No; I fancy the contract gives power to advance on material, and that no special authority was required. The memorandum of agreement was taken, as I have already pointed out, to meet the case of cement and other material which happened to be technically off the site of the works.

18872. Will you point out the clause of the contract which authorises the Department to make an advance upon material? It is not specifically referred to in the old contracts, but it is certainly contemplated in the general conditions.

18873. Will you look at the specification and conditions of Contract 79 and show His Honor the clause? I think it is contemplated in the 7th paragraph of clause 18 of the general conditions; but there is another paragraph I think which deals with it more fully. The clause to which I have just referred reads as follows :—

No certificate given to the contractor for any purpose whatever during the progress of the work shall prevent the Engineer, at any time before the final payment, from rejecting any unsound material or improper workmanship which may be discovered in the work, or from requiring the contractor to remove or amend at his own cost any work which may be found not to have been performed in accordance with the contract, or from deducting from any money which may be due or become due to the contractor the whole amount which may have been paid to the contractor for such material or work.

18877. But that relates to material fixed in place? It does not say so.

18845. Will you show us the other clause to which you have referred? The general conditions attached to Contract 79 seem to be slightly different from those attached to Contract 69. I cannot find the corresponding clause in Contract 79.

18876. Contract 69 was the later contract by two years? In the case of 69 the clause I have in my mind is the second paragraph of clause 34, which appears upon page 120 of the Parliamentary return:—"The like liability also shall hold good as to the obligation of the contractor in the event of any advance being made to him from the retention money or on material on the ground and not *in situ*." That paragraph I am not able to find in Contract 79; but in respect to the whole of the contracts, most certainly that is what guided us. These general conditions were being changed just about that time very much.

18877. Will you read the clause to which you have just referred from the commencement? Yes. The first portion of it is as follows :—

34. The contractor shall complete the whole of the works comprised in this contract within seventy-eight weeks from the date of the acceptance of his tender; and in the event of their non-completion at the specified times, should the Engineer not have proceeded under clauses 31 and 32 of these conditions, or either of them, the contractor shall pay, by way of liquidated damages, and not as or in the nature of a penalty, the sum of twenty pounds sterling for every week, or for every part of a week, that shall elapse after such specified time, until their completion, and which sum or sums may be deducted from any money payable to the contractor under this or any other contract. The contractor shall have no right to a certificate for payment after the date specified in these conditions for the completion of this contract until the whole of the works shall have been properly completed to the satisfaction of the Engineer, unless the time for the completion of this contract shall have been extended by the Minister, in which case such extended time shall become the time for the completion of this contract; and it is to be expressly understood that the fact of the time having been extended shall not in any way be taken as a waiver of this contract, or as annulling or setting aside this contract in any respect, nor be taken as releasing the contractor from any of the responsibilities or obligations of this contract, which, in all other respects, shall remain the same as if the time had not been extended.

18878. Contract 69 was let two years after Contract 79;—is not that so? It was let later.

18879. Two years afterwards, was it not? Yes; I think so.

18880.

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18880. *His Honor.*] Perhaps you may not have noticed the beginning of section 14 of the General Conditions of Contract 79—

All approved materials, plant, and prepared work, brought upon the ground for use in or on the works shall be considered, and shall be, the property of Her Majesty the Queen until completion of contract; and contractor shall not take away, remove, or dispose of any such material or plant or prepared work without the written authority of the Superintending Officer.

I presume that that is what you have been alluding to. It appears to bear upon the question. The section says, "All approved material." So that before any work is done at all it would become the property of the Crown. Of course the Crown has the right to move the property under certain circumstances. Therefore, it might very well be contended that an advance upon such property would almost be contemplated by the very terms of the condition? Yes, your Honor.

18881. It is the property of the Crown then at once? Yes, quite so.

18882. *Mr. Norrie.*] You know that up to quite recently in connection with sewerage contracts it was specially provided that an advance of from 75 to 90 per cent. might be made upon material on the ground? Yes; and also on plant. It was left out of the special conditions, I presume, because it was provided for in the general conditions. On that account, I suppose, it was not specifically mentioned.

18883. *His Honor.*] This practice, I understand you to say, has been observed in relation to all contracts—to everybody's contracts? In the case of every contract when the contractor has made a request to have an advance made upon material it has been complied with so long as we could get possession of the material.

18884. The Crown in a sort of way buys the material from the contractors? Yes; anticipating the material's being *in situ*. Instead of paying 60s. per cubic yard for brickwork the cost of the brickwork is anticipated in the progress returns by advancing upon the material that will be used in the brickwork.

18885. As to Contract 118—that contract and the dredge work clashed with one another, as we have seen. I want you to explain how it was that such an accident came about as that the contract should be let, and that, at the same time, work should be undertaken by the Department which necessarily had the effect of clashing with the carrying out of that contract. Perhaps you can explain it rather more clearly than it has been explained hitherto—that is, the coincidence of time in the two cases? The explanation to my mind is very simple. It was contemplated that in order to carry out the sand dredging it would be necessary to cut the drain:—that was cut apart altogether from the storm-water channel. Supposing the storm-water channel had not been let at the time, it was then that the drain must of necessity have been cut to relieve the flat of the water pumped on to it by the sand pumps.

18886. But why was not the drain laid out and contemplated before any request was made by Carter, Gummow, & Co. to have it done to save them from being flooded? It only took place, perhaps, a couple of days before the drain received attention. It may have been that the drain would not have been cut for a week or two as soon as it was, supposing Carter, Gummow, & Co. had not been carrying out the work, but at the time we let the work to Carter, Gummow, & Co. we knew that in the ordinary course of things they would have no obstruction from the sand pump dredging; and, that being the case, we had no hesitation in accepting their tender.

18887. Was the sand dredging being done by the Department by labour or by contract? By day labour.

18888. And the dyke, I suppose, had been built before this? Yes, some time previously.

18889. The reclamation, I suppose, could not be effectively carried out without No. 118 being also carried out to a certain extent? No. The two works must go on together, because immediately the reclamation is finished, Contract 118 must be extended through the dyke across the centre of the reclamation. The two works, therefore, must be carried out simultaneously. That was the case at Neutral Bay, Careening Cove, and White's Bay, Balmain. In all these reclamations where a sum of money is approved for reclaiming land, a sum sufficient to carry out the storm-water channel is also provided.

18890. In these cases, how did you manage with the sand dredge water when they came to carry out the sand dredging? At Neutral Bay precisely the same difficulty occurred. There the bay was very much smaller. The ground that had to be reclaimed was smaller, and we arranged with the contractor to suspend his works until the reclamation was finished. The dredges were on the opposite side of the reclaimed area to the storm-water channel just as in the present case, and the water was allowed to flow off into the bay back again.

18891. So that, really, the cause of Carter, Gummow, & Co.'s having to make a request that something should be done to save them from getting flooded was simply that there was a little more delay than usual in undertaking that part of the reclamation work—is that so? Yes. I suppose, as a matter of fact, we ought to have looked after the business ourselves. We must have seen that it was requisite that that drain should be cut.

18892. The dyke had already intercepted the channel of the creek? It had completely blocked the channel; in fact, there was no channel at the site of the dyke. The dyke was put in deep water, and the stormwater from the land above flowed across the mud flats and got into the deep water on the land side of the dyke. When the reclamation was proceeded with the sand would be deposited on the inside of the dyke first.

18893. Did the water then flow out through an opening in the dyke at the north-west end of it? Yes; an opening was made in the dyke—indeed it was left in the dyke at the time it was constructed for this water to flow out, and on the occasion of Mr. Hickson's visit the water was flowing out from the sand-dredge through this opening.

18894. But with no regular drain carrying it round the head? No; it was evidently contemplated that a drain should be cut, from the fact of the opening having been left there.

18895. I suppose the principle is this—that you have to begin to drain off the water as far as possible from the exit of the sand and water from the pipe. You want to allow settlement to take place between the outflow of the sand and water and the point where the water discharges into the carrying-off drain? Yes; it is always arranged so that the sand will have time to deposit between the time the water leaves the pipe and the time it flows out on to the harbour side of the dyke.

18896. And then you intercept the sand by fascine work and that sort of thing? Yes.



John Carter recalled and further examined:—

18897. *Mr. Parkes.*] With regard to Contract 77, I should like to know when you first became acquainted with Mr. Baltzer? Ten years ago. J. Carter.
- 18897½. How long was it before you entered into co-partnership in respect of the Monier patent? I really could not say exactly. That was an outside affair, and I did not take particular notice of the date. I should say it would be about four or five years ago. 23 Sept., 1896.
18898. How did you come to be associated with him in the patent;—did he approach you, or did you approach him? It happened merely through the force of circumstances. We were always discussing engineering matters, new improvements, and that sort of thing. That applied to sewerage and other works, and one thing led up to another. Mr. Baltzer naturally spoke at great length on the Monier system. He thought it a fairly good thing as far as he could see, and we went into it.
18899. You agreed to take it up together? Yes; he had no time and no experience, I presume, in outside work. He was not in touch with the practical part of sewerage matters, and, as we were, he naturally sought our assistance.
18900. How long before you offered them to the Department had you the patent rights? Some considerable time. I really could not tell you how long.
18901. How long was it before you offered them for sale? Some considerable time.
18902. Do you recollect the date upon which you took out the patent? No, I do not.
18903. The date of your offer to the Government is shown in the Parliamentary papers, and the date of your taking out the patent will, of course, be shown in the patent papers? Yes.
18904. With reference to Contract 77, and Mr. Baltzer's getting out the Monier design, how long before you sent in your tender did you know that he was getting out that design? Really, I could not tell you.
18905. Was it a couple of months? Possibly.
18906. You interviewed Mr. Young, the Minister, before sending in your tender? Yes; a short time before the tender went in. We naturally wanted to make sure there would be no hitch in the matter, so we went to head-quarters at once. It was of no use to approach Mr. Hickson or Mr. Barling. They would simply have referred us to the Minister, so we went straight to him.
18907. Did you never speak to Mr. Hickson about it all? Not about the putting in of the tender.
18908. But you spoke to him about the Monier system? Certainly; because I invited him to the test at North Shore. I think we actually sent up a model arch, which is in the office now.
18909. Did you tell him that you would like to have the Monier system applied to Contract 77? No.
18910. You never had any conversation with him on that subject? No.
18911. Did you ask Mr. Baltzer to see him? No; he never saw Mr. Hickson to my knowledge.
18912. Did he ever tell you that he had a conversation with Mr. Hickson? He did not. I would like you to understand that our connection with Mr. Baltzer did not appear to us to be a very important matter, and, unless the necessity arose, we should have very few discussions with him. The probability is that we should not see him, except at infrequent intervals.
18913. But it was he who introduced the patent to you? Yes; and then it died, so to speak, for a while. It was an offshoot from our business. We never considered it of any great importance until we really had time to take it up.
18914. When you entered into it it was an offshoot of your business, and you agreed that Mr. Baltzer should have some interest in the patent? I think there was a verbal agreement or arrangement. He was quite willing to leave the matter to our sense of justice. I am connected with a great many patents, but I am inclined to think that in the first instance there was in this case only a verbal arrangement.
18915. Did you never have any conversation as to the value to your business which would accrue from the adoption of the patent by the Government? We did not.
18916. Not with Mr. Baltzer? No. I might tell you, while I think of it, that the offer made by Mr. Armstrong was made entirely without my knowledge. I knew nothing of it as an offer until afterwards.
18917. Who guided Mr. Armstrong in the making of it? I did. I said to him, "We have a good patent; we might possibly do something with it with the Government." I do not know whether you will remember it, but the Government were offered a patent tram-grip at the time, and that set us on the track. Mr. Armstrong is a friend of mine, and I remember speaking to him on the steamer one morning as we were coming across about the Monier system. As far as I can recollect, what he said was, "Let me have a look at the patent. I will think it over." The next intimation I had was that he had made an offer of the patent to the Government for £1,500. I myself objected to it. I thought the figure was too low, but as the offer had been made I stood to it.
18918. With reference to the tendering—did you put in the tender on the Monier system on the day on which the Board of Reference sat? I put it in on the day on which the Tender Board met.
18919. The Tender Board met to consider it? To consider tenders. There is a difference between the Tender Board and the Board of Reference.
18920. You said in your former evidence that the plan was not completed until the day on which it was put in, did you not? Yes, to the best of my belief, and I believe it is true. It was not completed twenty-four hours before it was put in—I am certain of that.
18921. Then how did your firm make up their estimate upon it? We had the plan in pencil.
18922. Did you make your estimate upon the plan in pencil? Yes.
18923. Did Mr. Baltzar assist you? He did not.
18924. Who made up the estimate? Mr. Snodgrass and Mr. Gummow.
18925. And you yourself? No.
18926. You made it up off the plan in pencil? Yes.
18927. And without any detail specification to show you what the work would be? We had the detailed specification of the departmental design. We had all the information as to the tunnelling and the piers. We had all the information except that in regard to the Monier arches, and it was a simple matter to arrive at an estimate of the value of the arches.
18928. Did you see the drawing in pencil? Certainly; Mr. Gummow investigated it thoroughly while it was in course of preparation. He was brought over specially from Adelaide to go into the matter.
18929. What portion of the incomplete drawing was in pencil? It was a complete pencil drawing, but we could not send in a pencil drawing with our tender.



- J. Carter. 18930. Did you never see the drawing when it was incomplete—before all the pencil work was upon it? Certainly.
- 23 Sept., 1896. 18931. A portion was on it? Yes. It was referred to Mr. Gummow to use for comparison and checking. We were not going to take Mr. Baltzer's design as a correct design without investigating it.
18932. Was there any other drawing but that one? Not that I am aware of. There may have been a drawing of stresses and strains; there probably was.
18933. Have you got the figures showing how you made up your original estimate? Mr. Gummow may have.
18934. Are they in existence now? I think so. Mr. Gummow generally keeps all those things. Of course, we do not keep everything of that kind.
18935. Could they be produced? I could not tell you. You had better ask Mr. Gummow that question. I do not know anything about that part of the business. For instance, I have a tender in my hand just now, but I do not know how Mr. Gummow made it up. He probably kept the details in the case to which you refer, because it was the first estimate of the kind.
18936. *His Honor.*] You think Mr. Gummow may have the papers? Yes, I should think so.
18937. *Mr. Parkes.*] In connection with this same contract, did you have any conversation with Mr. Hickson after the tender was accepted? I do not think so.
18938. None at all? Only in connection with the bond. Naturally I interviewed him then.
18939. Did you not go into an estimate with him at all after the tender had been received? I did not.
18940. Did he ever question you about it? No; and I should not have given him the information had he done so.
18941. Did any officer of the department ask you how you made up the estimate? No; and it would have been a superfluous question as far as we were concerned. I should think anyone would know that they would not be likely to get the information.
18942. In what way would it be a superfluous question? Well, I would not tell Mr. Davis, Mr. Hickson, or anyone else, how we made up our tender.
18943. Not if you were asked? No; I should say let them find out for themselves.
18944. As to the Bond and Hudson matter;—when you saw Mr. Bond did he resist your offer? I suppose he did what any other business man would do in the circumstances. He stood off a bit to see whether he could get something more—whether he could make a better bargain. He naturally wanted to make the best bargain he could.
18945. He resisted your offer at first? I would not put it in that way; he naturally wanted time to consider the matter. I did not offer him £750 straight off. I tried first to persuade him to give up the contract without giving him anything. I did not rush to him with £750 at once. I saw him on several occasions.
18946. Had you not some knowledge that you would receive Contract 79 when you gave Mr. Bond the £750? I had not the faintest idea; in fact, as the correspondence and papers in the Public Works Department will show, we very nearly lost the work.
18947. Did you call upon Mr. Hickson on the very day upon which tenders were to be called? It is very possible.
18948. And you represented to him the claim you had in respect of Contract 72? I expect so.
18949. As to Contract 72, did you tender for that on the plans which included the drain which was afterwards cut down Shea's Creek? Really I could not say unless I saw the drawings.
18950. When you signed the contract plans was the drain which runs down the bed of Shea's Creek shown on those plans? If it is on them now it was on them then.
18951. But was it on them? That is the only answer I can make. I do not remember.
18952. You must remember the contract? Not necessarily.
18953. Was the contract originally for the cutting of that drain? I can only make the reply that if the drain is shown on the plans now it was shown on the plans then. Whether it was as wide as it was afterwards cut out is another matter. I do not think it was. Whether the drain was actually in existence on the plans or not I cannot say.
18954. What was the width to which it was cut? A considerable width.
18955. Do you recollect it? I have no idea of it.
18956. Was it 30 feet? Wider than that. At the top I should think it would be nearer 50 feet.
18957. Would it be 75 feet? I could not say.
18958. What was the width of the channel that discharged into it? I have not any idea.
18959. Was it 12 feet? I could not tell you.
18960. It was not more than 12 feet, was it? I should think it was.
18961. It was about 12 feet? More at the outlet, I think.
18962. Was it 14 feet? It is of no use asking me. I do not know.
18963. You have seen the contract? Yes, five years ago. I have never been there since.
18964. Do you think the width would exceed 15 feet? At the outlet I should think it might be 15 or 20 feet. I saw it when it was in a filthy state—when it was timbered up. That is all I know about it. You must recollect that I took no active interest in the construction of the work. I have a general idea of what is going on in the construction, and that is all.
18965. Did you tell Mr. Barling at any time that you were going to tender on the Monier system? No; except when I went to see him as to the putting in of the tender. I wanted someone to take charge of the plan.
18966. You told him then? I wanted to know what was to be done with the plan.
18967. What did Mr. Barling say to you? He was rather snappy with me, and, as far as I remember, he ordered me out of the room for coming before 11 o'clock. I think he said, "Take it to Mr. McLachlan. It is of no use giving it to me," or something to that effect.
18968. Did he say anything else about your submitting the Monier design? He did not.
18969. How was it that subsequently you changed the construction from *compo.* to concrete? By reason of the experiments we were carrying out. We were carrying out the work regardless of cost to ourselves, because we were anxious to arrive at the very best result. We wished to obtain the very best experience we could in the matter. We made some tests, and we concluded that the alteration to which you refer would be beneficial, and obtained Mr. Darley's consent to it.

18970. Was it not Mr. Darley who instructed you first of all to make the alteration? Not as far as I know. J. Carter.
18971. Was it you or he who made the first suggestion? I do not know that there was any suggestion. The thing grew up out of a series of tests. Mr. Darley took a great interest in the construction, and we naturally did the same. It was as the outcome of a series of tests that the alteration was made. 23 Sept., 1896.
18972. In the case of the Victoria-street sewer, which Bond and Hudson tendered for, and which they finally threw up, did you ever approach Bond and Hudson on that occasion and ask them to increase their tender? No.
18973. You got that contract? Yes.
18974. Prior to the date upon which Gummow, Gillan, & Co. joined Carter, Snodgrass, & Co., had you not some sort of business connection in respect to Contract 79? No connection whatever. I do not remember anything like it. You must be in error.
18975. If, in the books of Parbury, Henty, and Co., when Contract 72 was going on, there is an entry for cement charged to Carter, Gummow, & Co., that would be the same firm, would it not;—did you ever deal in cement together? No.
18976. Did you have any stores together? No stores whatever.
18977. Did you have any business connection before you joined? We might have exchanged plant. I might have bought some of their plant and they might have bought some of ours. It is a common thing among contractors to buy each others plant. I have sold plant twelve months back and have bought it at the present time. Contractors' plant is constantly changing hands. I might say that up to the time Carter & Co. and Gummow and Gillan joined forces they were severely antagonistic. It was simply a question of which one would beat the other. I have repeatedly heard Mr. Gummow say that the only firm he ever considered in tendering was ours, and we took exactly the same stand as to theirs. We actually cut each other's throats.
18978. As to the cement which you say was removed from Contract 72, can you recollect where you had it moved to? I have no idea. We had it shifted while the works were in suspension, or afterwards.
18979. While the works were suspended, you say? Yes.
18980. Is that when you had most of the cement shifted? I could not tell you. It was shifted; that is all I know.
18981. In your claim you say, "Loss on resale of 2,000 casks of cement"? Yes.
18982. And "1,300 casks of cement on site"? Yes.
18983. What were the 2,000 casks;—it says, "Loss on resale of 2,000 casks"? That was an awkwardly expressed clause, as far as I can see. It should have been, "Loss on the forced sale of cement on ground." We had naturally to pay for the cement tested and untested in the sheds, and had we been compelled to sell that cement we should have had to sell it at a loss, it being untested. You have also to consider that it was in a far away locality—Shea's Creek—and that probably there would be heavy cartage.
18984. *His Honor.*] You did not in fact resell it? No; we should have been compelled to resell it if we had not got the other contracts. It was an anticipatory loss, but it was a loss all the same. If we had ceased work then, and had not got the North Shore contract, that cement would have been sold at a considerable loss to us. We had heavy stocks arriving.
18985. *Mr. Parkes.* If there appears in Parbury, Henty, & Co.'s books, about November, 1892, an entry of 7d. a barrel for the resale of 1,900 odd casks of cement, what would that transaction be? I have no recollection of any such transaction. I do not think it ever took place. Mr. Henty might be able to explain it to you.
18986. But if such an entry appears in their books, can you not recollect what it would be for? I cannot.
18987. When Burcombe took that cement which he took from Contract 72, where did he deliver it? At North Shore.
18988. On what part of North Shore? On Contract 79.
18989. At the sheds? At various sheds.
18990. Where were the sheds fixed? Along the line of sewer. There were three or four sheds.
18991. And he would deliver it there? Yes; he could not deliver it anywhere else.
18992. What about M'Millan's deliveries—where were they? On the site of the works. It is quite possible that he may have delivered the cement at the board. If it was tested cement it might not go into the sheds at all. If we were sending tested cement, as we frequently do, from one contract to another, it might be taken direct to the board.
18993. They say they took hundreds of barrels? They probably took thousands. We were constantly conveying cement from one site to another.
18994. How many thousands do you think they may have taken? I could not say. The carting would extend over four or five years. They must have carted a very large quantity. We were locked up at Shea's Creek with a very big stock.
18995. I wish you would tell His Honor how much money Mr. Forrest put into the original purchase of the "Lodge" property, at North Shore? An equal amount to Mr. Snodgrass and myself. It was paid out of the firm's account.
18996. In those days the firm consisted of more than three? Yes.
18997. Does the property not belong to the firm's account? No; to Carter, Snodgrass, and Forrest.
18998. Is not the property, as a matter of fact, paid for with money out of the firm of Carter, Gummow, & Co.? No.
18999. Was not the mortgage money obtained upon it paid into the account of Carter, Gummow, & Co.? I do not think so. If it was, it was simply a cross entry. The property belongs absolutely to Carter, Snodgrass, and Forrest, and always has; it was paid for with their money.
19000. But the fact still remains that the money was paid out of the firm of Carter, Gummow, & Co., and that you have not replaced it? It never came out of the firm of Carter, Gummow, & Co.
19001. It came out of the firm of Carter & Co., did it? The original purchase money.
19002. And it appears in the accounts as a debit against Carter, Gummow, & Co.? It has nothing whatever to do with Carter, Gummow, & Co.
19003. When did you buy the property? About three or four years ago. I think we bought it just before we joined Gummow and Gillan.
19004. It was Carter, Gummow, & Co. who bought the property, was it not? No; Carter & Co.
19005. But if it appears to be so from their bank-books that must be right, must it not? No; it is absolutely

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- absolutely impossible. Carter, Gummow, & Co. have nothing whatever to do with the property. It is the sole property of Carter, Snodgrass, and Forrest, and it was paid for out of Carter & Co.'s account.
19006. Regularly every quarter you pay a sum by way of interest to Sir William Manning, do you not? Yes; the interest upon the mortgage upon the property.
19007. At the present time you are paying Sir William Manning interest upon the loan upon the Lodge property? Yes; Carter & Co. are.
19008. Who do you say are paying it? Carter & Co.
19009. But they have no banking account now? Oh, yes they have.
19010. Apart from Carter, Gummow, & Co.'s account? Yes.
19011. I thought you said in your former evidence that they had no account, and that the account ceased when Carter & Co. amalgamated with Gummow and Gillan? I said it ceased except for the purposes of receiving rent and paying interest. It is still open for the purpose of paying the interest on the Lodge property.
19012. Those bank-books you have not handed in? Yes; they are there.
19013. But they run only to 1892? No; they go up to 1896.
19014. Has the interest been paid out of Carter & Co.'s account? Yes.
19015. And you say that Mr. Forrest and Mr. Snodgrass have an equal share in the property with yourself? They have.
19016. *Mr. Davis.*] Referring to the stock of cement which you had upon Contract 72, it is a fact, is it not, that you had between 3,000 and 4,000 casks of cement on the ground at the time the work was suspended, or immediately afterwards? Certainly.
19017. Did you not ask for 2,000 of those casks to be tested? Yes.
19018. And for the time being you were refused the test on the ground that it might give you something to go upon in connection with your claim? Yes. I believe that was your reason for refusing to test it.
19019. What was the first contract Carter, Gummow, & Co. had in the Sewerage Branch? No. 69.
19020. That firm had nothing whatever to do with Contract 79? No; 79 was Carter & Co.'s contract.
19021. As to the adoption of concrete in the carrier of 77, which is more costly, compo. or concrete? Concrete.
19022. And in spite of that you were willing to adopt it because you considered that it would make a better job, and Mr. Darley agreed? Yes, I do not think there was any correspondence on the subject. It was simply the outcome, as I have explained, of a series of tests.
19023. Are you sure that the earth channel below the outlet of the concrete channel upon Contract 72 was constructed larger than is shown on the contract drawings? No, I am not. I have very little recollection of the earth channel at all.
19024. Supposing the bottom width of the earth channel is 21 feet, with suitable slopes, is it not likely that the reduced quantities of the concrete channel and the earth channel would be similar? Probably. You must have a bigger carrying area in an earth channel than in a concrete channel.
19025. On account of what? On account of the friction. A concrete channel carries water with much less friction than does an earth channel. An earth channel is also bound to silt up to a greater or less degree in the case of storms, and you must make provision for that.
19026. As to the advances on material and the refund of retention money, do you know what the practice is in South Australia? Yes.
19027. Will you tell His Honor what it is? They advance on material, and they refund the retention money. I know that some considerable time ago we applied for some £5,000 of retention money, which was refunded to us.
19028. So that the practice in the Sewerage Branch is not dissimilar to the practice in other colonies? The practice of advancing on material and refunding either the deposit or retention money is universal as far as I know. We have never had any difficulty anywhere in that matter. It is done everywhere.
19029. As you are aware, one or two witnesses have alleged that certain defective work has been done in connection with your contracts—you remember, for instance, the evidence of Dawson and Darcus, and one or two others;—what have you to say with regard to that—has any defective work been done to your knowledge? No.
19030. Or by your direction? Not in any shape or form. I know absolutely nothing about it.
19031. What quantity of concrete would have made good the holes to which Dawson called attention as having been left? As far as I know, we expect to put it all back for £2 or £3. I have not been down to see exactly what is wanting.
19031. Even if Dawson had done this defective work at your instigation, the utmost saving to you would have been about £2? Yes.
19032. But it turns out that he did it for his own purposes? So I believe.
19034. It has been insinuated—I do not know in reference to whom—that an officer of the department had something to do with betting or some connection with racing affairs;—will you tell His Honor whether it has been your practice to keep any racehorses? No, I am not a racing man.
19035. Does any member of your firm keep racehorses? No.
19036. *His Honor.*] Keeping racehorses is one thing and betting is another? I do not do either as far I know; in fact, I very seldom go to horse races. Bicycle sports have a greater attraction for me.
19037. *Mr. Davis.*] You have been putting in tenders for sewerage works for how many years? Seven or eight years.
19038. You have put in dozens of tenders during that time? Scores of them.
19039. Will you swear absolutely that in the preparation of these tenders you received no assistance or hint whatever from any officer of the department? I swear that absolutely.
19040. And that the preparation of the tenders was entirely apart from and independent of any officer of the department? Exactly. I never thought we had any need to go to the office, even if we had had an opportunity, to obtain assistance in that direction.
19041. You pride yourself that you know a great deal better than the office what the value of work is? We do, naturally.
19042. So that you do not want to go to the office to get assistance in that way? No.
19043. In fact, I suppose you think that if you had gone to the office you would probably have been misled? We should not have obtained information which would have been of any use to us. I am certain of

of that. You must remember that we devote all our time to nothing but acquiring information and experience in regard to the one matter of underground sewerage work.

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19044. What have you to say as to the bluestone pitchers in the case of Contract 69 ;—do you say that you had no information as to the small quantity which was included in the schedule? No information whatever.

19045. *His Honor.*] Will you explain the whole affair as far as you know it? The tender was made up by Mr. Snodgrass; and honestly I do not think I knew that a certain price was put opposite this particular item until after the tender was in. Mr. Snodgrass made it up entirely on his own responsibility, Mr. Gummow being absent at the time in Adelaide—in fact, it was Mr. Snodgrass' duty to make it up. The only thing that I have ever been consulted about in reference to our tenders is as to the amount of profit we should put in. Our tenders are made out on business lines. The actual cost is arrived at apart from any schedule or anything else the Government may hand over to us. We do not depend upon them. We depend upon our own information. Then comes the question as to what shall be added on to the actual working cost for plant, supervision, contingencies, and profit. It was only when the question of these additions came to be considered that I was called on to look into the matter.

19046. What was your work, then, in relation to tendering and the carrying out of contracts before Mr. Gummow came into the firm—that is, while you were Carter & Co.? My work lay in seeing that all the material was provided at the lowest possible rates, and to the best advantage in every way, and that it was delivered on to the ground in sufficient quantities to keep the work going. I had also to represent the firm with the department in the cases of dispute and to settle financial matters with the bank. Contractors often want overdrafts, and all these matters have to be attended to. For years I do not think I was ever 3 feet below the surface in the case of our underground contracts, except, perhaps, for final inspection.

19047. *Mr. Davis.*] When did it first come to your knowledge that the price of £50 had been put into the schedule for these bluestone pitchers? Soon after the tender was in. Perhaps a day or so afterwards. I often met Mr. Snodgrass at the bank, and I would then ask him what was the amount of the cheque he required. In those days, under the old system, we had to base the amount of the cheque upon the lump sum of the tender. It was not as now.

19048. As to the £50, when did you hear of that? I heard of it after the tender was in. It is quite possible that I may have heard it on the same morning. I cannot say precisely. It may have been then or a day or two afterwards.

19049. *His Honor.*] Did Mr. Snodgrass tell you of the matter as a good joke—that is, how he had jumped at the mistake of the department? I think he said it was good business. Mr. Snodgrass took out all the quantities himself and estimated the probable quantities. Looking down the various items, he often told me where he thought we should make our point. It was our business to look after these various items.

19050. The number 12 in connection with the item of bluestone pitchers, the proper number being 30, would strike you as being an obvious mistake on the part of some one? Yes; it was presumably a mistake. Mr. Snodgrass would know that the practice of the department was to surround the manhole covers with pitchers in almost every case, and if there were twenty or thirty shafts there would naturally be that number of pitchers.

19051. Do you remember that Mr. Snodgrass told you that he had bowled out the department? Yes; no doubt he did. We often discussed such matters.

19052. Did it not strike you that the putting in of the price of £50 might be a dangerous point to take? I honestly thought that we went too far in that matter—that the amount was excessive; but it had been given in, and there was an end of it. If I had been there when the tender was made out I should have felt inclined to put in, say, £20; £50 was an excessive amount.

19053. You would have been afraid that it might have wrecked your tender? No; but one does not like to exceed a good price, because it leads to disputes, and disputes over prices between the department and contractors are never very paying or pleasant to either side.

19054. You did not have any dispute with Mr. Snodgrass over the matter? No; we never disputed. Every man in the firm did the best he could according to his view, and there was an end of it. If a mistake was made we all stood up to it.

19055. *Mr. Davis.*] Was there any other shot you made in that tender ;—did you make a shot in connection with the cement rendering? Yes.

19056. Did you hit the mark in that case? We were a little bit off the mark. Mr. Snodgrass estimated what he considered would be the amount of cement rendering required, and put in a good price for it, viz., 5s. The usual price would be 2s. or 2s. 6d., but he considered that at least the quantity set down in the Government schedule would be carried out. As it happened it was not.

19057. *His Honor.*] He made a bad shot in that case? We did not always come off, but that was in the business.

19058. *Mr. Davis.*] He estimated that the arches would be rendered, and it was decided just about that time that it was unnecessary to render the arches, and, as a consequence, it was not done in this case? No.

19059. It was not shown to be done in the drawings, and Mr. Snodgrass had not taken that into account? No.

19060. So that, if you made a point in regard to the £50 for bluestone pitchers, you did not make any in the other case? No; we are not always right any more than is anyone else.

19061. What about the timbering—why did you put down 1d. for timbering ;—can you explain that? I prefer not to explain it. I have only a general idea of these things.

19062. *His Honor.*] You mean, I suppose, that you prefer not to explain it because you think you cannot do so correctly? Yes; I do not do these things. I only get my information from other members of the firm. I do not know their reasons. I do not know how they arrive at these things, and I do not want to guess at anything.

19063. You think that you may perhaps make a mistake? Yes. I have a good idea of why it was done, but that is not actual knowledge.

19064. *Mr. Andrews.*] Would Mr. Gummow be able to explain it? Yes.

19065. *Mr. Parkes.*] In your schedule you tendered for cement facing at 5s. a yard, and the Government put down 11,600 yards at 2s. 6d., did they not? Yes.

19066. And you were paid for 12,000 yards at 5s.? I do not think so.

19067.

- J. Carter.  
23 Sept., 1896.
19067. Does not that appear in your final voucher? I do not think so. We have exceeded the office quantity, but as far as Mr. Snodgrass was concerned, he expected to exceed it very considerably. He would not be satisfied with 11,000 or 12,000 yards.
19068. *Mr. Davis.*] He went on the same lines as in the bluestone pitchers; he expected that the quantity in the schedule would be considerably below the quantity which would appear in the final certificate? Yes. There is no use in putting an excessive price upon an item which will work out exactly as shown in the schedule. You want to put an excessive price upon an item which is likely to be exceeded.
19069. *Mr. Parkes.*] But there was no diminution in the number of yards of cement facing? If the final certificate says that there was not, I suppose there was not; but I do not understand that that was the case. I understand that there was about a thousand yards under the schedule quantity. I am only trusting to my memory, and it is quite possible that there may have been a small increase.
19070. *His Honor.*] An increase generally means a loss somewhere else—that is to say, something else has to be kept down;—if you put one thing up you have to put another thing down, in order to make up for the increase; otherwise you would not keep your total low enough? Quite so.

William Henry Warren, sworn and examined:—

- W. H. Warren.  
23 Sept., 1896.
19071. *His Honor.*] I believe you wish to make a statement to the Commission? Yes. It has reference to Mr. Bagge's evidence. In reply to Question 13163, he made certain statements. One of these was that I was at one time in his office. That would be about fifteen and a half years ago. That statement is true. The rest of the statements, as far as they concern me, are entirely untrue. For instance he says "When the position of Professor at the University was advertised he asked me what I thought of it; I said 'By all means take it. I am afraid you will never be a civil engineer.'" I may say that I did not consult anyone whatever about that matter—in fact, I remember that Mr. Bennett was rather annoyed that I had not spoken to him about it. There was no conversation whatever between us on the matter. Then, in reply to the next question, he says, "I said to Professor Warren, 'You are a Dublin University man; you ought to be a good calculator.'" I am not a Dublin University man, and, as a matter of fact, he never said anything of the sort to me. I was at the Royal College of Science in Dublin, and at the Victorian University in Manchester. Further on Mr. Bagge says that Mr. Cardew, Mr. Hammer, and he himself, made calculations with me. Mr. Cardew did not. Of course it was my duty to make various calculations, but it is absolutely untrue to say that I made a calculation and got stuck in the way Mr. Bagge describes. That is entirely untrue.
19072. *His Honor.*] You did not get bogged? No.
19073. *Mr. Davis.*] Do you know about the failure of the Bondi sewer? I heard of it. That was due to the pumping, not to any defect in the strength of the arches.
19074. You inspected the sewer during construction? Yes.
19075. What is your opinion professionally as to the cause of the accident? Well, they were simply pumping the sand away and undermining it.
19076. It would have been impossible for it to have been caused as alleged by Mr. Bagge? Yes. Had there been another foot of thickness in the arch it would have been just the same. There was running sand at that particular spot, and you could pump it just like water.
19077. What was the pump working for? To keep the water out so that they could get the concrete in. There was a channel underneath, and it was necessary to keep the water out, because otherwise the flow of water would have interfered with the work.
19078. It was while the sewer was in course of construction that this thing happened—not afterwards, when it was in working order? That is so.
19079. *His Honor.*] They were pumping out the sumps, in fact, and the subducts were working too vigorously sucking in the sand? Yes. It was a difficult piece of work—one of the most difficult pieces of work they had in the Sewerage Department.
19080. Did you make any calculation at all as alleged by Mr. Bagge? I made a calculation as to the thickness of the sewer, and I made it out to be 3 feet, knowing full well that it might be too thick. No man living could make an exact calculation even now.
19081. Were not others engaged upon that calculation, as Mr. Bagge says? None that I checked with.
19082. Were not the gentlemen he named making that same calculation? Mr. Cardew at that time, I think, never made any calculations whatever as to construction. He was engaged entirely upon survey work. The whole of Mr. Bagge's version of the matter is a mass of mistakes, and he ought to be ashamed of himself for making such statements.
19083. You are sure that the gentlemen he mentioned were not making this particular calculation with you? Mr. Hammer may have made a calculation, but I have no recollection of it. I do not remember the circumstances at all. The sewer was 3 feet thick. I remember making a section of it.
19084. Have you seen much of Mr. Bagge of late years? No; I have not seen him for four or five years. I do not think I have seen him more than once or twice since I left the department.
19085. When you used to see a good deal of him in that way in the old days, does your recollection serve you as to whether he was then a man of accurate memory? He was a comparatively old man even then.
19086. Had his memory begun to get shaky at that time? I should hardly like to say that.
19087. You did not notice it then? No.
19088. As to whether that is the case now or not, you cannot say unless you take the evidence to which you have referred as a criterion? No, I do not wish to reflect in any way upon Mr. Bagge. I merely wished to explain that he had made these inaccurate statements.
19089. You do not wish to suggest that he voluntarily made these inaccurate statements;—what you suggest is that he made a mistake? I suggest nothing as to why or how he made the mistake. I merely say that the statements are untrue.

John Carter recalled and further examined:—

- J. Carter.  
23 Sept., 1896.
19090. *Mr. Parkes.*] I find that the quantity of cement facing in the case of Contract 69 was reduced from 11,600 yards in the schedule to 10,683 yards according to the final certificate;—those are the figures, are they not? Yes, I believe so. 19091.

19091. Your 5s. a yard was in excess of the price of all the other tenderers, was it not? I could not tell you that. J. Carter.

19092. For instance, the price of the Department was 2s. 6d., you had 5s., John Ahearn had 2s. 6d., Kerle and Kerle had 3s., Mackenzie and Son had 3s., M'Sweeney had 1s. 6d., Holloway Bros. had 1s. 6d., Carson had 1s. 6d., and so on? I expect those figures are correct. 1s. 3d. was the best item for the contractors as it turned out. We lost money on the 5s.

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19093. How did you do that? Because we had adjusted the amount to some of the other items.

19094. Can you tell me what other items specify cement facing? No other items; but the price was adjusted upon other items to allow us to put 5s. upon cement facing, upon the supposition that that item would be increased. As it turned out it was decreased, therefore we lost in both ways.

19095. *His Honor.*] Would the omission of the facing increase the cost of the brickwork at all by increasing your work in pointing? We had naturally to exercise a good deal more care in striking the joints and facing the work up than we should do if the work were afterwards to be covered with plaster.

19096. *Mr. Davis.*] You had nothing extra for that? No; we lost in every way through the item not being exceeded.

Thomas Edward Spencer sworn and examined:—

19097. *Mr. Davis.*] What are you? A contractor.

19098. Have you carried out any sewerage contracts? Yes; I carried out Contract 50 and Contract 67—Contract 50 being at Bourke-street and Riley-street, Woolloomooloo, and Contract 67 at the Glebe. T.E. Spencer.

19099. Upon these contracts you have used very large quantities of cement, both in brickwork and in bluestone and sandstone concrete? Yes; and in rendering.

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19100. I suppose it was necessary for you to keep in a general way an idea of what a cask of cement would make in both bluestone and sandstone concrete? Yes.

19101. Will you tell His Honor what your experience has been in the Sewerage Department with their specification in respect to these two kinds of concrete? I have always estimated that a cask of cement would make a yard of sandstone concrete, and that a yard of bluestone concrete would take about a cask and a fifth.

19102. That would be about 22 feet to the cask? Yes; we established that as a guide upon the Woolloomooloo contract. I do not know whether you or Mr. Smail were supervising the work at the time, but we measured a gauge of concrete in which a cask of cement was used. The stone was measured according to specification, under the superintendence of an inspector, and it measured, as nearly as possible, 22 feet. We adopted that afterwards as the gauge.

19103. And you were paid for concrete, where it was impossible to measure it, upon that gauging? Yes.

19104. That applied to all the bluestone concrete which could not be measured? Yes; Mr. Gledhill was the inspector who supervised the measurements.

19105. You considered that that was about a fair thing? Yes; we decided that it was about a fair thing.

19106. But even that measurement would fluctuate according to the position in which the concrete was used, and according to whether it was rammed horizontally or vertically? Yes; it would fluctuate even on the board itself. You could not measure two yards which would go exactly alike. The size and shape of the stone would cause a fluctuation.

19107. Still, taking all things into consideration, in the case of tunnel work, you consider that the measurement you have given is a fair thing? Yes.

19108. Have you had an engineer named Chiene in your employ? No.

19109. You do not know anything about him? No; absolutely nothing.

19110. I thought he said in his evidence that he had been in your employ? If he did he was wrong.

19111. Did you have Inspector Reid supervising your work? Yes; for a portion of the time.

19112. Did you form any opinion of him? I think we formed an opinion that he really did not know much about the work.

19113. Did he endeavour to do his duty? I think so, in accordance with his own opinion of his duty. He was always there, but the men used to complain to me that he hindered them in their work.

19114. In what way? Well, supposing they were putting timber in down below, he would insist upon having it done in his way, and it was often their opinion that his way was not correct. Then they would argue the matter out. There would then be five or six men standing idle for half an hour. I would then complain of the length of time occupied in the putting in of the timber, and the men generally said it was Reid's fault. I do not think I ever complained to you about it; but I know I was very much annoyed about it.

19115. You consider that he endeavored to do his duty, but sometimes he was too particular;—was that it? Yes—that he was deficient in knowledge. That was my opinion of him.

19116. *His Honor.*] You spoke just now about the gauging of cement; you do not mean, I suppose, that the quantities were afterwards allowed on that basis;—they were allowed on measurement, were they not? Yes, where it was possible to measure them. There were some cases where it would be absolutely impossible to measure accurately, and then we used to take the gauging, and allow a cask of cement to 22 feet of concrete.

19117. The Engineer agreed to that? Yes; it was agreed to by the Department and myself.

19118. In all cases where measurements could be made you were allowed upon those measurements? Yes.

19119. Did you ever tally the actual measurements against the measurement as it would have come out upon the basis you have given? Yes.

19120. Did you find that they fitted? I found in the case of the Glebe contract that they tallied within eleven casks of cement upon the whole work.

19121. How many casks were used? About 2,800. I think I paid for eleven casks more than ought to have been used upon the basis of the measurements, but that could easily be accounted for by waste in one way or another.

William

William Greenwood sworn and examined :—

W.  
Greenwood.  
23 Sept., 1896.

19122. *Mr. Davis.*] What are you? A civil engineer by profession; but I am a contractor now.
19123. You have been engaged for a number of years in carrying out concrete work in this country and also in England? Yes.
19124. You have had experience in sewerage work both here and in England? Yes; I have done sewerage work at home as well as here.
19125. Have you carried out any contracts for the Sewerage Branch of the Public Works Department? I think only one for the Sewerage Branch.
19126. Have you carried out any for the Water and Sewerage Board? I have done pipelaying for them, but I do not think I have carried out sewerage for the Water and Sewerage Board.
19127. You know the Sewerage specification for sandstone concrete? Yes.
19128. What have you found from your experience that a cask of cement will make in the case of sandstone and bluestone concrete? It depends upon the material.
19129. You would say that it would vary very much? Yes.
19130. What would make the difference? I have seen material delivered in Sydney go into sewerage work in bluestone concrete that would not make perhaps 20 feet of concrete. I have seen what you would call 1½ inch material delivered with all the shivers taken out of it; that would not bulk in the box, but had it been delivered as it left the crusher, with everything in except the ½ inch screening specified, it would bulk considerably.
19131. Would you say also that the position in which concrete has to be put would have anything to do with the bulking of it;—supposing, for instance, it has to be put in over the arch of a sewer where you have to ram it horizontally, and then supposing, on the other hand, that it had to be put in between boxing where you could ram it vertically, would the two positions have anything to do with the bulking? If it went in upon the top of the centerings in a sewer in a tunnel it would have to be rammed horizontally, and then you could not ram it tightly if it were thin work.
19132. And a cask of cement would go much further under those conditions than under conditions where you could ram vertically? It would not make more concrete, of course, when it left the platform, but it would fill up more space.
19133. Inasmuch as it had to be rammed horizontally? It could not be rammed as tightly, even in the case of a railway tunnel where it runs 1 ft. 6 in. thick. You would not be able to get it in tightly.
19134. Would you say that the quantity of water had anything to do with the quantity of concrete which a cask of cement would make? It would make a material difference. I have known work to be done for the Corporation which has varied as much as from 10 to 12 per cent. I know that when the inspector made me use less water I gained so much in the cube yard. I know that directly he told me to put in dry concrete I gained directly as regards the quantity of material. The concrete would not be so dense as if it were put in wet.
19135. You know the kind of work which is carried out by the Sewerage Branch, and you know also the specification;—what would you say, in view of the specification and the material used, that a cask of cement would make in the case of bluestone and sandstone concrete? It depends upon whether a contractor knows his business, or upon whether he is new to the work. Take the case of 1½ inch metal. Some contractors would use it without any small stuff in it at all, but a contractor who is up to his work knows better than that. He would take care to include as much small stuff as he could. Take material coming from Kiama, if there had been a demand for screenings for asphalt, you would find a lot of the small stuff taken out. You buy it by measurement, not by weight. You can tell whether you have been robbed of the screening by the measurement. If the small stuff is not in, then the sand and cement will not bulk it. They simply go to fill the interstices. In my own case I should take good care that they did not rob me of the screenings. I should take care that I got all the stuff that came from the crusher with the exception of ½ inch screenings, as provided by the specification. Some contractors, on the other hand, would take the stuff without the screenings, and that, of course, would make a difference in the bulking.
19136. In your judgment they would lose? There is no question about that. Some of them find it out before they have finished their contracts.
19137. Which, in your opinion, would make the best concrete? The stone with all the fine stuff in.
19138. That would make better concrete, you think, than stone with all the fine stuff eliminated? If all the small stuff is in, you get solid concrete. If it is taken out, you will get a certain amount of honey-combing.
19139. Can you express an opinion as to the quantity which a cask of cement will make? It ought to make 22 feet of concrete in the case of bluestone.
19140. What would it make in the case of sandstone if all the small stuff were left in and if only the sand were eliminated? The same thing applies there. It depends upon whether the stone is hand-broken or whether it is broken by a crusher. If it were broken by hand, there would not be very much small stuff in it. If it were crushed you would have a greater proportion of small stuff.
19141. Suppose the stone to be broken by a crusher, what would a cask of cement make? If it were broken by a crusher a cask of cement ought to make a cube yard.
19142. What would it make if the stone were knapped? It would depend upon whether it were hard stone or soft stone. If it were soft stone it would make more fine stuff in breaking.
19143. You seem to think that the conditions under which concrete is made would be so various that it would be almost impossible to arrive precisely at the quantity which a cask of cement would make? Yes.
19144. You think it would vary considerably in different places under the same contract? If I were going to make up a tender I should have regard to the quarry from which I intended to obtain the stone. The harder the stone the less small stuff there would be in it.
19145. And under those conditions you would allow for more cement? Yes; then there is another consideration—a great deal depends upon the manner in which the box is filled. If a man is strange to the work, and if he fills from the corners, and having first got in all the rough stone, puts a little fine stuff on the top, the concrete made from that gauging will not bulk as much as concrete made from a gauging in which the small stone had been mixed thoroughly with the bigger stone throughout the box.
19146. You have carried out woodblocking contracts both for the Corporation and for the Government? Yes; I have done the bulk of the Harbours and Rivers woodpaving, and one-third of the corporation work.

19147.



19147. Did you get any extension at any time from the Government in any of their works—I mean an extension of your contract? Yes. Take the case of the Circular Quay wood-paving. I think the contract was about £22,000 when I took it. When we got to the French wharf there was an application for an extension, and the Government gave me the 30 per cent. of additional work at contract price.

W.  
Greenwood.  
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19148. You obtained an extension of that particular work 30 per cent. over and above the amount you had signed for in the contract? Yes.

19149. *Mr. Carter.*] Do you know the firm of Carter, Gummow, & Co.? I know Mr. Gummow.

19150. You would say that the firm consisted of men of some experience, and that they would be likely to know how much a cask of cement would make in sewer work? As far as sewer work is concerned, they are more experienced, probably, than any other firm in Sydney.

19151. *Mr. Parkes.*] If you were mixing for concrete, and you put in the larger material first as you have described, and then put the siftings on the top of it, you would still have a further process, because it has to be mixed three times dry, has it not? It is mixed twice dry.

19152. That would mix the large and small stuff pretty uniformly? Yes; but you would not make more of it. It would not increase the bulk. If the stone were mixed as you suggest, it would not bulk as much as if the fine stone were run right through the box.

19153. You think that after you had mixed it it would decrease in bulking? It would be bound to decrease if it were put in the box as you suggest.

Andrew Eaton sworn and examined:—

19154. *Mr. Davis.*] What are you? A contractor.

19155. Have you carried out any work for the Sewerage Branch of the Public Works Department? Yes.

19156. You have a contract now? Yes.

19157. For how long have you been carrying out work in the Sewerage Branch? About three years.

19158. You have, necessarily, watched pretty closely the quantity of cement that you have used in your work? Yes; we have checked the quantity of cement against the Engineer's measurements every month.

19159. So that you are in a position to say what a cask of cement will make in bluestone concrete and in sandstone concrete under the conditions in which you have carried out your work? Yes.

19160. Will you tell His Honor what your experience has been? In the case of the Croydon job, 5,000 yards of concrete ran out at 26 feet to the cask in the case of sandstone concrete. At Double Bay, 3,500 yards ran out sometimes a little over 26 feet, and sometimes at 26 feet.

19161. And what about the bluestone concrete? At Croydon, a little over 1,200 yards ran out at 23 feet, and at Double Bay 400 yards ran out at 23 feet.

19162. That is all storm-water sewer—open work? Yes.

19163. And the concrete was put in between boards? Yes.

19164. You were able to ram all the concrete vertically? Yes.

19165. Did you have in your employ a man named Chiene? For a short time.

19166. Will you tell His Honor what was your experience of him? He did not suit us; we got rid of him.

19167. What was your reason for getting rid of him? He was unsatisfactory in every way.

19168. Could you tell us in what way? There were so many ways in which he was unsatisfactory. I could not very well describe any particular thing.

19169. *His Honor.*] What was the way in which he was most unsatisfactory? It was principally the way in which he set out the work. There were other things in connection with it. He did not suit us. We only gave him the work because when he spoke to us he said he was very hard up and we should be doing a charity if we gave him a job—if we could find anything for him to do. We said we would look round and see what we could do, and we finally engaged him provisionally at 15s. a day. After the first day we saw that he would not suit, and as things went on we found him altogether unsatisfactory and got rid of him.

19170. Is there any other reason for your doing so besides the fact that he was not able to do the work? There was a reason.

19171. Are you at liberty to give it? One of the principal reasons was that he deceived the engineer in one of his measurements. When I saw a copy of the voucher I pointed out the mistake to Chiene, and he asked us what it mattered to us whether it was right or wrong so long as we got the money. I said that that was not the way in which we did our work, and that the best thing he could do would be to get the voucher altered. At the next measurement, instead of making any alteration, he left things as they were, and I would not put up with that.

19172. *His Honor.*] Was he putting in excessive measurements? He measured a length of sandstone concrete as bluestone concrete.

19173. *Mr. Parkes.*] I suppose you were highly indignant at that? I was, because it was bound to be found out sooner or later, and then our voucher might be kept from going through. We do not engage men to do what is wrong; we engage them to do what is fair. As a matter of fact, the mistake was seen the very next time a measurement was made.

19174. *His Honor.*] Did Chiene say that he had made a mistake;—did he excuse himself on that ground? When I pointed it out to him he said he thought he was doing us a good turn in getting the sandstone concrete measured under a different item in the schedule. I have kept the two vouchers showing where the error was made and where it was corrected.

19175. Is Chiene a thirsty soul? When a person does not drink himself I fancy he is not able to form an opinion as to whether another man drinks or not. Chiene never asked me for a drink, but he borrowed money from some of the men on the job. I did not know that until we had got rid of him.

19176. When you got rid of him did you find out that that was one of his weaknesses? Yes.

19177. That he was a thirsty soul? Yes; I did not know it at the time.

19178. *Mr. Parkes.*] Did you ever see Chiene drunk upon your works? No; I was seldom on the works. The control of the works was left principally to the foreman on the job.

19179. Did you see Chiene on the works at all? Yes.

19180. Was he sober when you saw him? Yes, as far as I could judge.

A. Eaton.  
23 Sept., 1896.

- A. Eaton. 19181. What did he say in explanation when you represented to him that he had returned sandstone as bluestone concrete? What I have just told you—that he thought he was doing us a good turn in getting the sandstone concrete measured under an item in the schedule for which we were getting a higher price.
19182. Did he say he had ever done that on any job? I did not speak to him about it. I said it did not suit me.
19183. Did he say he had made a custom of doing that on any other job? No. When we left the engineers' office he came up to the tram with me. He showed me a copy of the voucher in pencil, and I showed him where the mistake was.
19184. You said just now that he made the measurement with the engineer? He and the engineer made it up in the engineers' office.
19185. Who was the engineer? Mr. Henderson.
19186. Did he not go down to look at the work? I suppose he had a look at the work. He was a new man altogether. It was the first job of that description that he had to look after.
19187. Did he find out that the sandstone concrete was paid for as bluestone concrete? He found it out afterwards.
19188. Did he find it out before you did? He spoke to me about it.
19189. Before you spoke to Chiene? No; it was after I had got rid of Chiene.
19190. He spoke to you about it first? Yes.

Joseph Davis recalled and further examined:—

- J. Davis. 19191. *His Honor.*] A clear explanation of the functions of the Tender Board and the Board of Reference has not yet been given; will you explain the functions of the two bodies? The Tender Board is composed of the Minister as President, of the Under Secretary, as Vice-President, and of the heads of branches; and their province is to receive tenders on stated occasions, and to declare the result in the presence of the public. The tenders are then passed on to the officers concerned—that is to say, if it happened to be a sewerage tender it would go on to the head of the Sewerage Branch, and so on. Then, at the next meeting of the Board of Reference, the tender would be submitted to the Board for consideration by the officer concerned. The Board of Reference is composed of the Under Secretary, as President, and of the heads of branches, and they recommend to the Minister the acceptance or non-acceptance of the tender. In addition to dealing with tenders—for dealing with tenders is a very small part of the work they have to perform—they deal with all matters, technical and otherwise, which arise in the Department—in short with any matter concerning which the Minister wishes to obtain their opinion. They deal also with any matter which may arise in connection with any one of the branches and which may be referred to the Board by the head of the branch; also with any matter concerning which the Under Secretary may require the opinion of the Board before submitting it to the Minister: so that while the constitution of the Board of Reference is similar to that of the Tender Board, the two bodies are quite distinct. The Board of Reference does not, of course, include the Minister. I think that briefly explains their functions.
19192. *Mr. Norrie.*] The Tender Board deals exclusively with tenders? Yes.
19193. And the Board of Reference with matters generally affecting the Department? Yes.
19194. The Chief Clerk of the Department is Secretary to the Tender Board? Yes.
19195. And Mr. Holliman is Secretary to the Board of Reference? Yes.

FRIDAY, 25 SEPTEMBER, 1896.

Charles James Henty sworn and examined:—

- C. J. Henty. 19196. *Mr. Gummow.*] What are you? A merchant.
19197. Of what firm? Parbury, Henty, & Co., of London and Sydney, and James Henty & Co., of Melbourne.
19198. You deal largely in cement—you import large quantities? Yes.
19199. And you sell it to contractors and to other persons? Yes.
19200. Were you a bondsman for Carter, Gummow, & Co. for one of their contracts? Yes.
19201. If it has been stated that Mr. Henty, who supplied the firm with cement, was a bondsman for the firm, that would apply to you? Yes.
19202. If it has been stated in respect to that particular contract that one of the sureties was a supplier of cement, and the other a supplier of iron;—would that apply to you? Yes. I was surety for the contractors in respect of Contract 69. There were two sureties, as far as I can remember.
19203. What have you to say as to this statement—that “there were two sureties of a very doubtful nature”—is that correct, as far as you are concerned? No; distinctly not.
19204. Do you know for what amount you were a surety? £4,600 odd, I think.
19205. Would you have met that liability if you had been called upon to do so? Certainly I would. I do not undertake anything I am not willing to meet.
19206. Did you ever hear that the contractors received any of the retention money back during the progress of the work? No; not that I can recollect. I do not think I did.
19207. If they did receive any back would you try to make it an excuse for breaking your portion of the contract? I should be sorry to make any excuse. If I once signed a contract, I should not go back upon my signature.
19208. Do you consider that you were liable right up to the end of the contract for the bond you signed? Until such time as I was properly released I consider that I was liable. Whether that release took place at the end of the contract or before I do not know myself, but I do not wish to shirk any liabilities.
19209. Have you had inquiries made by the Commission as to your cement deliveries to Carter, Gummow, & Co.? A few.
19210. Did you supply any invoices? Copies of invoices were supplied.
19211. Did your staff supply them? Well, that is a point upon which Mr. Christie and I do not quite agree, and with His Honor's permission I should like to explain the matter. I received His Honor's note on the 20th June. It was an extremely awkward date, because we were starting our annual balance. I explained

C. J. Henty.  
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explained to Mr. Christie that it would be very awkward for us to put any of our staff on to the work, and I asked him whether he could send one of his clerks down. He said he was too busy to do so, and we mutually arranged to get outside aid, and that any clerk from outside who compiled the returns should have every facility for doing so. As a matter of fact, a clerk came in, and if there was anything which he could not readily trace I did my level best to help him in the matter.

19212. Have you the original returns with you? Yes; I believe they have been handed to the Commission by Mr. Christie.

19213. Are they the returns made out in your office? Yes.

19214. With regard to the deliveries, do you know whether the deliveries given in that return are correct as regards the places and other details? The bulk of them I should say were correct. There were one or two items upon which Mr. Christie and I disagreed, and I last night went through them again, taking this return as a basis. I then drew up a sort of summary, which I think pretty well explains the position.

19215. Have you it with you? Yes; it is a tabular statement; it shows the number of casks, and, as nearly as possible, the localities to which they were delivered. [*Vide Appendix No. 75.*]

19216. *His Honor.*] Does it exhibit any difference which may exist between the result you arrived at and the result which Mr. Christie arrived at? Yes.

19217. That is what it is arranged to show? Yes; there is a little difference between Mr. Christie and myself. The item of 832 casks is the principal item.

19218. *Mr. Parkes.*] Is there any difference between the two totals of the quantity of cement delivered on to all contracts? None whatever. We credited Carter, Gummow, & Co., with 832 casks of cement, which had been returned; but I am not in a position to say where it actually came from. I have included it as probably returned from Marrickville, but I am not in a position to swear where it all came from.

19219. Did you tell Mr. Christie where it came from? No, I think we put down Marrickville with a query.

19220. As to the delivery of these different quantities of cement—did you guarantee them as correct when Mr. Christie previously went to your office? I cannot say that I guaranteed them as correct. It is a big undertaking in respect of a lot of cement like this. I should be very sorry to guarantee it cask for cask. I went through the items yesterday with Mr. Christie, and I think we then agreed to the doubtful items.

19221. If Mr. Christie, in answer to my question 8510, "Did the firm give you particulars of the delivery definitely?" said "Yes," would that be correct? Up to a certain point the particulars given would be correct. Some of the items were queried. I should not like to say that the return was absolutely correct.

19222. Am I to understand that at the time to which I refer, or at the present time, you could guarantee the delivery of the whole quantity? I can say this—that we have traced, as far as we could trace them, the orders. Some of this cement has been delivered by order. Some of it has been delivered to carters, and some of it has been lightered. We can trace from the carters' receipts the carting of some of it to different places. I have no hesitation in saying that the return is correct in respect of those places where we have been able to trace it. As to the lightered portion—having access to the lighter books and accounts—we can say that those entries are correct. There are, however, some items which are doubtful. For instance, there is an item which was delivered in the first instance from Dalton's bond. Mr. Holden, who made out this return, I believe, ascertained that it was delivered to Molloy to cart to Marrickville.

19223. *Mr. Parkes.*] Is that the only one? There are one or two very small items, which are not very material. There is another item of 134 casks delivered to Molloy, the carrier, for Marrickville, and then, of course, there is the item of 832 casks.

19224. Those are the whole of the items that are queried? That is all that are of any consequence. There are fifty casks queried in connection with North Shore;—200 out of a delivery of 250 were charged to North Shore; but I am not positive as to the whole quantity, and I would not swear concerning anything about which I am not positive.

19225. Do you know when Carter, Gummow, and Co. buy cement off you whether they buy it for any particular contract? Sometimes the contractors will mention a definite job, and at other times the entry is simply so many thousand casks to Carter, Gummow, & Co.

19226. Does it say where the cement is delivered to? It is delivered wherever the contractors may direct. For instance, we have a contract running now with Phillips and Rhodes in connection with their sewerage and ventilating shafts. The contract covers delivery to anywhere Phillips and Rhodes may direct. All-round contracts are often taken like that.

19227. Do you deliver at the same price everywhere? In connection with these contracts I have averaged the prices, taking the long distances with the short distances. We sell for city delivery, and if there is any carting outside the city boundary that would be a matter of arrangement between the carriers and ourselves. We charge the contractors that price on. They pay the extra cartage.

19228. Have you not had a transaction with Carter & Co. lately for 6,000 casks city delivery? About what date?

19229. About the middle of last year? Yes.

19230. That delivery extended over some time? Yes. I forgot the exact quantity. We have a contract with Carter, Gummow, & Co. which is under delivery now.

19231. You usually contract for city delivery, and then charge the contractors whatever sum there may be above that? Yes.

19232. So that it is immaterial to you where the cement is delivered? Quite so.

19233. Do contractors buy off you subject to any test? Subject to the Government test.

19234. And if the cement does not pass the test, who has to stand the loss of delivery and return? The importers, I am sorry to say.

19235. The contractors do not? No.

19236. So that it would be of no benefit to them to try to use condemned cement, or to force it on? No, I cannot see where any benefit would come in, because if they were to do that they would forfeit their claim upon the importers in the event of any trouble arising.

19237. Have contractors ever bought any cement off you other than subject to Government test for any Government work? Not for any Government work.

19238. Not for any work connected with the Sewerage Department? No.

19239. Do you know whether the cement you issue to any contract is used upon that contract, or whether it may be shifted to other contracts at the contractors' own option? I could not say at all what becomes of the cement

C. J. Henty, cement when it leaves our hands. After that we do not know what becomes of it unless we receive notice that it has been condemned, and then we know very quickly.

25 Sept., 1896.

19240. Have you ever had a conversation with Mr. Carter upon the question of the firm's keeping books? Yes.

19241. What kind of conversation was it? It was not very serious. It was a chaffing or jocular conversation more than anything else.

19242. When was it? It must have been from three to four years back. There was at the time I think a fair sized cheque standing out, and Mr. Carter came into the office. I made some jocular remark as he passed my door, saying, I think, that I was glad to see him. He said, "I suppose you think I have a cheque with me." I think, therefore, that I can fix the time of the conversation by the amount of the cheque. On looking over these returns I am inclined to think that the conversation must have occurred some time prior to any of the dates included in it.

19243. Have you any idea how long ago it was—was it two years ago? I think it must have been over three years ago.

19244. Before there was any talk of this Commission? Yes. I think there was from £2,000 to £3,000 owing at the time. I thought I could trace the time by the amount in this return; but the conversation must have occurred prior to any date contained in this return, that is prior to May, 1892.

19245. What was the conversation;—can you remember the substance of it? It started in the way I have already stated. Of course, I cannot swear to the exact words. Mr. Carter said he had not brought a cheque, but that he would go to the Bank and see if he could get one. I think I then told him that he need not do that, and asked him whether he had had his Bank balance that morning. He then said that he did not know how the firm stood financially until he went up to the Bank. It then came out in the conversation that he did not keep any books in connection with the firm. That struck me as being very funny. I told him I thought it was wrong not to keep books, and he then explained to me his reasons for not doing so. The reasons were these—the creditors were very few. He mentioned cement, iron, and a few other items; I forget exactly what they were. He pointed out that a monthly statement would show what was owing, and that the payments from the Government would show what they had already had on the contract and the balance owing, the Bank passbooks showing the credits and debits. It seemed to me to be a happy-go-lucky way of doing things. As far as I can remember it, that was the substance of the conversation.

19246. So that after that conversation you were satisfied that the firm did not keep books? That was the inference I drew.

19247. Did you do business with them afterwards? Yes.

19248. Did you ever have any trouble about getting your cheques? None whatever.

19249. Do you ever have any fear about not getting them? No.

19250. Did you find out anything about the firm;—did you make any inquiries concerning them? I cannot say I did. I understood from people who had been trading with you prior to my coming to Sydney that you had always paid your way; and, as you had always paid your way with me, I took you as I found you.

19251. There was a cheque paid to Parbury, Henty, & Co., on November 6th, 1895, for £2,946;—for how long was that amount running before it was paid, do you know? The average of the deliveries of that payment would be about the end of September.

19252. Did Mr. Carter ever offer you any cheque before the time when he paid you the £2,946? Several times Mr. Carter has offered to square up, and I have told him that there was no hurry, and that we were not in want of money. In this case he may have offered me a cheque or he may not. I may say that Mr. Carter and myself are good business friends. We chaff a good deal in business hours, I am afraid.

19253. *His Honor.*] You trust each other? Certainly; I trust Mr. Carter, and I hope he does the same to me.

19254. *Mr. Gummow.*] You were not at all afraid of not receiving payment from the firm? No, never.

19255. Did you know the position of the firm at that time;—did you know how they stood financially? I did not know their actual financial standing. I always looked upon them as sound men. They always paid their way with me. I never had the least trouble with them.

19256. Had you any connection with the firm in regard to any of their contracts other than the signing of the bond for them? None whatever.

19257. You did not assist them in any way? No, never. I may say at once that I am not allowed to interest myself in anything outside my own business according to our deed of partnership.

19258. Would you like to make any statement as to the question of your being a surety for the firm, and with regard to the question of your being doubtful financially? I thought it was rather a rough thing to say.

19259. *Mr. Parkes.*] You will see if you look at the wording of the speech in *Hansard* that the observation refers to the manner in which the sureties were taken? I have not read *Hansard*, but I saw your remark published in the newspapers. You may remember that I mentioned it to you, and I understood you to say that you did not wish to throw any slur on my standing financially or anything of that sort.

19260. If Mr. Gummow were to read the whole of the sentence in *Hansard* you would see exactly what was meant? I merely wish to have any insinuation of that kind—if there were such an insinuation—clearly explained. It is a matter of importance to a man like myself who is trading in many foreign countries and whose signature is known in London, India, China, and on the Continent of Europe. It is rather a nasty observation to have floating about. I may mention that when I saw it I had written a letter to the newspapers concerning it; but, seeing that the whole matter was *sub judice*, I determined not to have it published, hoping that there would be an opportunity to obtain a withdrawal of the statement here.

19261. *Mr. Gummow.*] Mr. Parkes in his speech said "Now the very first contract I turn up here, although the specification provides for a cash deposit to be put down on the Secretary for Public Work's authority, they are allowed to substitute two sureties of a very doubtful nature";—do you not consider that the word "surety" there applies to you? It certainly looks like it.

19262. *Mr. Parkes.*] But if you punctuate the sentence and read it differently you will find out how it does apply? I have not read it; it was owing to several persons talking to me about it that I felt a little warm about it at the time.

19263.

19263. *His Honor.*] I suppose they chaffed you about it? Yes; it was more good-natured chaff than anything else. I took the first opportunity, when Mr. Christie introduced me to Mr. Parkes, to tackle him about it. C. J. Henty.  
25 Sept., 1896.

19264. *Mr. Parkes.*] You will see that the sentence has reference only to the change of method—that is, from a cash to a personal security—and also to sureties being taken who were suppliers of material to the contractors? I should be quite satisfied if you would state definitely that you did not wish to throw any doubt upon my financial standing.

19265. Certainly I did not? Then I am quite satisfied.

19266. You will see that no names are mentioned? But even so, most persons would know that I am one of the largest suppliers of cement to all Government contracts.

19267. *Mr. Gummow.*] I will ask you to refer to what is said upon page 27 of *Hansard*. In the same speech Mr. Parkes says, “On the Engineer’s advice the Secretary for Public Works substituted two surety bondsmen, namely, Mr. Scrutton, who supplied the iron to these contractors, and Mr. Henty, who supplied the cement”? Yes, I see that my name is mentioned. What I really wish is that my name should be cleared of any suspicion of my not being a man of sound means, or of my being of a doubtful character in any way. Mr. Parkes, I understand, has already said that he does not wish to cast any slur upon my character, financially or otherwise, so that I am quite satisfied, and I suppose His Honor is also satisfied.

19268. *His Honor.*] As far as I am concerned, you need not trouble yourself at all? Then I hope the Press will make a note of what has been said on the subject.

19269. *Mr. Gummow.*] Mr. Parkes was in error in stating that he did not mention your name in the speech? Yes; he certainly referred to me.

19270. *Mr. Parkes.*] But I had no intention of saying that you were a doubtful man. All I wished to say was that the bonds were of a doubtful nature? I took it to be a personal matter, or I should not have tackled you in the way I did.

19271. I should have said doubtful men instead of bonds of a doubtful nature if I had intended what you suggest? I think I ought to say that the observation as published in the Sydney papers was noticed by my friends in Melbourne.

19272. Your name was not mentioned in the Sydney papers, was it? Yes.

19273. I will set the matter at rest by asking you if at the time you signed that bond you would have been able to make a statutory declaration that you were worth cash equal to £4,600 over and above your just debts and liabilities? I had not £4,600 lying in the bank at the time, but I was in a position to raise it, of course.

19274. But you were not in a position to make a statutory declaration that you had that amount in cash at the time? I had not that amount to my credit at the bank at the time, but I was worth it, of course.

19275. In connection with these returns which were prepared in your office, the only assistance Mr. Christie had was that of the son of your bookkeeper, was it not? Yes.

19276. He was brought in at your suggestion? That is not quite the right way in which to put it. I suggested that an outside clerk should be brought in, and Mr. Christie guaranteed his expenses.

19277. You recommended this young man? Yes; because he was the son of my bookkeeper. No firm cares to have any person called in haphazard to look over their books.

19278. Mr. Christie said himself, did he not, that he would not take the responsibility of doing the work, for fear he would be challenged. Since the return has been made out Mr. Christie has told me that he considered it my work, and not his. It is only splitting hairs, as far as I can see.

19279. As a matter of fact the son of your bookkeeper worked with his father in getting this information,—that is, the father assisted him, did he not? Very little, if at all.

19280. Still, I suppose he would refer to his father? No; if he was in doubt he referred chiefly to Mr. Christie or to myself. If there were any matter in which I could help him I put him in the way of getting the information. I think his father was pottering about there one morning for some time. If you know the man you will know what I mean when I say that he was pottering about.

19281. There is no doubt that the whole of the figures in Mr. Christie’s return are correct with the exception of the two items of delivery you spoke of? As far as the extracts from the ledger are concerned they are without doubt correct. I checked them myself. As far as the quantities and prices of the cement are concerned they are without doubt correct. As to the deliveries, their correctness would be dependent to a great extent on outside information; but, as far as I can see, they are practically correct. The information has been inferred in some instances. The information we have points to the place where the cement was delivered in those instances; but I cannot positively swear that it did go there.

19282. Take the 832 casks which were returned from Marrickville;—your charge is 8d. for cartage in that case, is it not? Yes.

19283. And you have made a charge of 8d. in this instance? Yes.

19284. That would indicate, would it not, that it came from Marrickville? No; not definitely, because 8d. is charged in the case of North Shore as well. Mr. Christie and I were talking about this item last night, and we agreed to query it as “probably Marrickville.”

19285. It came from one place or the other? I could not say. I had better explain how this credit came to be made. At the time there was a great deal of cement being chopped and changed about. Mr. Davis will know that at that time the rejects were very heavy, and most importers of cement had a great deal of trouble to keep contracts going—so much so that I brought several thousands of casks from Melbourne to keep pace with our orders, and lost heavily over it. There was a shipment per “Talavera” which we were using as a sort of sink; instead of keeping all our shipments open we put all our returns under the heading of one ship, and then we only kept one account sales back to square the others. This credit note, which shows the return of 832 casks, is a credit note out of that shipment. The cartage is put down to a contract which we then had running with Carter, Gummow, & Co., and that is how the 8d. cartage gets in. It looks as if it came from Marrickville, but I should not like to swear that it did, because I am somewhat in doubt about it.

19286. Molloy carted it? Yes.

19287. If Molloy says that he carted a certain quantity of cement from Marrickville that would settle the doubt? Yes; he would know a great deal better than I do. In going into the matter we found that many items of the cartage account fitted in, so to speak, with the invoices. I believe Mr. Christie has a copy of Molloy’s cartage account.

19288.

C. J. Henty. 19288. I would like you to read the summary of cement deliveries which you prepared with Mr. Christie last night? Yes; it is as follows:—  
25 Sept., 1896.

|  |       |   |        |
|--|-------|---|--------|
| <i>North Shore—</i>                        |       |   |        |
| Definite.....                              | 4,200 |   |        |
| Probable.....                              | 100   |   |        |
|  |       | — | 4,300  |
| <i>Marrickville—</i>                       |       |   |        |
| Definite.....                              | 7,367 |   |        |
| Probable.....                              | 128   |   |        |
|  |       | — |        |
|  | 7,495 |   |        |
| Probable returned.....                     | 832   | — | 6,663  |
| <i>Annandale, Leichhardt, and Rozelle—</i> |       |   |        |
| Annandale.....                             | 5,924 |   |        |
| Leichhardt and Rozelle.....                | 595   |   |        |
|  |       | — | 6,519  |
| <i>Waverley—</i>                           |       |   |        |
| Definite .....                             | 100   |   |        |
| Probable .....                             | 150   |   |        |
|  |       | — | 250    |
| <i>Sundries—</i>                           |       |   |        |
| Drummoyne .....                            | 24    |   |        |
| Garson Bros. ....                          | 150   |   |        |
| Not traced .....                           | 64    |   |        |
|  |       | — | 238    |
|  |       |   | —      |
|  |       |   | 17,970 |

19289. Mr. Christie's statement then varies very little from yours? The chief difference is in respect of the 832 casks and the item of 66 casks.

19290. It only varies in respect to the delivery in those cases? Yes.

19291. Not in the totals? No; the totals cannot be wrong, because our ledgers show them, and the books cannot lie.

19292. There is no doubt, for instance, about the delivery of the 6,519 casks to Annandale, Leichhardt, and Rozelle? No, there is no doubt in my mind about that.

19293. What date is given in your return as regards the 832 casks? 150 on 25th July, 1894, 98 on 27th August, 1894, and 584 on 7th September, 1894. Those are all stated as "*ex Talavera.*"

19294. What is the date of the first delivery to Annandale? 10th September, 1895, 800 casks.

19295. Among your accounts against Carter & Co. there is a return of 2,000 casks, 7½d. being charged for loss on resale;—can you explain that? It is not a return; it has never been delivered. There were 2,000 casks of cement that came in to us if my memory serves me right, and instead of delivering to Carter, Gummow, & Co. we cancelled the sale and charged them the difference between our selling price to them and the then market price.

19296. Do you recollect the date upon which the contract was made for that supply? No.

19297. Had it been any length of time in hand? That I could not say.

19298. The quantity is not exactly 2,000; it is 1,925, is it not? There is an item of 1,000 casks, the date of which is 29th November, 1892. Then there is an item of 925 casks also under date 29th November, 1892. Those are the two credit notes.

19299. Was that cement tested in the stores, or was it sent to the job and tested? I cannot say.

19300. On what date was it invoiced? On 24th October, 1892.

19301. Do you remember where it was delivered to? I should not like to say for certain. It was invoiced on 24th October, 1892, and it was credited on 29th November, 1892. As to the delivery, it does not appear to have been traced. It was simply debited and credited.

19302. What is the loss with which you charged the contractors on both of these items;—what did you charge in the case of the 1,000 casks? I have only a total credit—£31 5s. Speaking from memory, I think the charge was 7½d.

19303. Do you recollect what the charge was in the case of the 925? We debited them at 10s. 10½d., and we credited them at 10s. 3d.

19304. That would be 7½d. for the 1,925 casks? It looks like it.

19305. *Mr. Gummow.*] Were the 1,925 casks included in the return you gave to Mr. Christie? No; one item has cancelled the other.

Joseph Davis recalled and further examined:—

J. Davis. 19306. *Mr. Smith.*] With reference to this matter of the new general conditions;—you stated in your evidence the other day that the new general conditions were approved on the 4th February, 1894? Yes.  
25 Sept., 1896. 19307. That was when formal Ministerial approval was received for the whole lot of them? Yes.  
19308. But you have searched the minutes of the Board and have ascertained upon what date this particular clause relating to retention money—I mean the payment clause—was passed by the Board? Yes; on 28th December, 1891, as far as can be gathered from the minutes.  
19309. And after that, in anticipation of the final approval, that clause was acted upon? Yes.  
19310. The minute of Mr. Hickson's, to which you referred the other day, afforded only one instance, among many others, in which the operation of that clause was anticipated? Yes.

19311.

19311. You have prepared a report as to the cement? Yes; I have made a memo. showing briefly the way in which I regard the question of cement, as it has been put before this Commission, in connection with the quantity which would be used in the works. It is as follows :—

J. Davis.  
25 Sept., 1896.

Referring to the evidence given by Mr. Christie as to the amount of cement purchased between the 1st January, 1892, and 30th June, 1896, wherein he states that the contractors have purchased for Contracts Nos. 69, 79, and 79A, 13,431 casks, and assuming this to be approximately correct, I have made the following calculations, based upon the data attached hereto, viz. :—

Sandstone concrete—1 cask of cement makes 27 cubic feet of material in place.  
 Bluestone " " " " 22 " " " " " " " " " " " " " " " "  
 Brickwork in 1 ring—Mortar, " 10 per cent. of bulk—1 cask of " cement makes 8 2/3 cubic feet mortar.  
 " " 2 rings— " " 15 " " " " " " " " " " " "  
 Cement facings, 5/8 inch thick—1 cask of cement makes 8 2/3 cubic feet of material in place. "

| Material.               | Unit.        | Quantity paid for. | Constant. | Casks. | Total. |
|-------------------------|--------------|--------------------|-----------|--------|--------|
| Contract No. 69—        |              |                    |           |        |        |
| Sandstone concrete..... | Cubic yds... | 1,031              | 1 00      | 1,031  | 8,387  |
| Bluestone concrete..... | "            | 4,844              | 1 23      | 5,958  |        |
| Brickwork, 1 ring.....  | "            | 480                | 0 311     | 149    |        |
| Brickwork, 2 rings..... | "            | 1,441              | 0 467     | 672    |        |
| Cement facing.....      | Square yds.  | 10,683             | 0 054     | 577    |        |
| Contract No. 79—        |              |                    |           |        |        |
| Sandstone concrete..... | Cubic yds... | 1,872              | 1 00      | 1,872  | 4,642  |
| Bluestone ".....        | "            | 1,724              | 1 23      | 2,120  |        |
| Brickwork, 1 ring.....  | "            | 522                | 0 311     | 162    |        |
| Cement facing.....      | Square yds.  | 9,034              | 0 054     | 488    |        |
| Contract No. 79A—       |              |                    |           |        |        |
| Sandstone concrete..... | Cubic yds... | 717                | 1 00      | 717    | 2,577  |
| Bluestone ".....        | "            | 1,290              | 1 23      | 1,587  |        |
| Brickwork, 1 ring.....  | "            | 302                | 0 311     | 94     |        |
| Cement facing.....      | Square yds.  | 3,317              | 0 054     | 179    |        |

The total, therefore, based upon the above, would be 15,606 casks for the three contracts.

I have also taken the inspector's daily returns for the same contracts, and find that the number of casks returned used was as follows :—

| <i>Inspector's Returns.</i> |                  |
|-----------------------------|------------------|
| Contract No. 69 .....       | 7,965 1/2 casks. |
| "    No. 79 .....           | 5,384 1/2 " "    |
| "    No. 79A.....           | 2,269 " "        |
|                             | 15,619 " "       |

These returns, however, for the reasons already given in evidence, cannot be relied upon absolutely, but should be within about 5 per cent. of the quantity actually used.

If the quantity in stock on Contract 72 only on the 1st January, 1892 (which may be ascertained from the claim already referred to in the evidence, page 256, in respect to Contract No. 72) be taken into consideration and then be added to the quantity given by Mr. Christie, say 2,200 casks, the total quantity used in the three contracts under review would be as follows :—

|   |        |
|---|--------|
| Quantity certified to by Mr. Christie ..... | 13,432 |
| Add from stock from Contract No. 72.....    | 2,200  |
| Total .....                                 | 15,632 |

Mr. Burcombe, in his evidence, page 488, question 14,238, states that he carted over 2,000 casks of cement from Contract No. 72 to Contract No. 79.

It will further be seen by Mr. Boys' report of the 19th November, 1891, and my minute thereon, that on that date the contractors had an excess of 2,000 casks on the job.

Public Works Department, Sewerage Branch, Sydney, 19 November, 1891.

STORAGE OF CEMENT, CONTRACT No. 72.

J. Davis, Esq., Supervising Engineer.

Sir,

Messrs. Carter & Co. have informed me that they have stored 2,000 B. barrels of cement on the Munni-street to Shea's Creek contract, and require it to be tested. This quantity is in excess of the amount required to finish the present work, and I have refused to bring the samples.

Yours, &c.,  
J. W. BOYS.

91/2799  
S

Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 19 November, 1891.

CONTRACT No. 72.—STORMWATER CHANNEL FROM MUNNI-STREET TO SHEA'S CREEK.

Contractors ask that 2,000 casks of cement be tested, which will not be required on work at present sanctioned.

The contractors, I understand, have delivered 2,000 casks of cement on the Shea's Creek work more than will be required to finish the concrete and rendering to its junction with Macdonaldtown Channel, and they are asking for this to be tested. It appears to me that, if we tested this cement, it might be used by the contractors against the department in connection with the claim they have made for part of the channel being cut out of their contract, and I should like, before doing anything in the matter, the instructions of the Engineer-in-Chief.

Mr. Bagge.

J. DAVIS.

For the consideration of the Engineer-in-Chief.—C. H. OHLFSEN-BAGGE, 19/11/91. The total extra required is £9,000.—R. H., 20/11/91. Submitted.—J. B., 25/11/91. As



J. Davis.  
25 Sept., 1896.

As there is considerable doubt as to the quantity of cement delivered upon any particular work, and lest there should be some question as to the quantity of cement in stock on Messrs. Carter & Co.'s contracts, on the 1st January, 1892, I have prepared a statement of the quantity of cement which I calculate should have been used on the whole of the contracts let to Carter & Co., and Carter, Gummow, & Co., based upon the previous data :—

| Material.                 | Unit.        | Quantity paid for. | Constant. | Casks. | Total.        |
|---------------------------|--------------|--------------------|-----------|--------|---------------|
| <b>Contract No. 53—</b>   |              |                    |           |        |               |
| Sandstone concrete .....  | Cubic yds... | 922                | 1·00      | 922    | 3,103         |
| Bluestone concrete .....  | "            | 1,393              | 1·23      | 1,713  |               |
| Brickwork, 1 ring .....   | "            | 224                | 0·311     | 70     |               |
| Brickwork, 2 rings .....  | "            | 259                | 0·467     | 121    |               |
| Cement facing .....       | Square yds.  | 5,139              | 0·054     | 277    |               |
| <b>Contract No. 56—</b>   |              |                    |           |        |               |
| Sandstone concrete.....   | Cubic yds... | 346                | 1·00      | 346    | 1,642         |
| Bluestone concrete .....  | "            | 756                | 1·23      | 929    |               |
| Brickwork, 1 ring .....   | "            | 111                | 0·311     | 34     |               |
| Brickwork, 2 rings .....  | "            | 298                | 0·467     | 139    |               |
| Cement facing .....       | Square yds.  | 3,598              | 0·054     | 194    |               |
| <b>Contract No. 60—</b>   |              |                    |           |        |               |
| Bluestone concrete .....  | Cubic yds... | 293                | 1·23      | 360    | 405           |
| Sandstone concrete.....   | "            | 83                 | 1·00      | 8      |               |
| Cement facing .....       | Square yds.  | 695                | 0·054     | 37     |               |
| <b>Contract No. 61—</b>   |              |                    |           |        |               |
| Sandstone concrete.....   | Cubic yds... | 79                 | 1·00      | 79     | 779           |
| Bluestone concrete .....  | "            | 516                | 1·23      | 634    |               |
| Cement facing .....       | Square yds.  | 1,223              | 0·054     | 66     |               |
| <b>Contract No 65—</b>    |              |                    |           |        |               |
| Sandstone concrete.....   | Cubic yds... | 1,135              | 1·00      | 1,135  | 5,077         |
| Bluestone concrete .....  | "            | 2,385              | 1·23      | 2,933  |               |
| Brickwork, 1 ring .....   | "            | 307                | 0·311     | 95     |               |
| Brickwork, 2 rings .....  | "            | 778                | 0·467     | 364    |               |
| Cement facing .....       | Square yds.  | 10,198             | 0·054     | 550    |               |
| <b>Contract No. 69—</b>   |              |                    |           |        |               |
| As before .....           | .....        | .....              | .....     | .....  | 8,387         |
| <b>Contract No. 72—</b>   |              |                    |           |        |               |
| Sandstone concrete.....   | Cubic yds... | 8,372              | 1·00      | 8,372  | 9,048         |
| Bluestone concrete .....  | "            | .....              | .....     | .....  |               |
| Brickwork, 1 ring .....   | Cubic yds... | 32                 | 0·311     | 10     |               |
| Brickwork, 2 rings .....  | "            | .....              | .....     | .....  |               |
| Cement facing .....       | Square yds.  | 12,324             | 0·054     | 666    |               |
| <b>Contract No. 77—</b>   |              |                    |           |        |               |
| Sandstone concrete.....   | Cubic yds... | 1,388              | 1·00      | 1,388  | 2,803         |
| Bluestone concrete .....  | "            | 146                | 1·80      | 263    |               |
| Compo. ....               | "            | 576                | 2·00      | 1,152  |               |
| <b>Contract No. 79—</b>   |              |                    |           |        |               |
| As before .....           | .....        | .....              | .....     | .....  | 4,642         |
| <b>Contract No. 79a—</b>  |              |                    |           |        |               |
| As before .....           | .....        | .....              | .....     | .....  | 2,577         |
| <b>Contract No. 118--</b> |              |                    |           |        |               |
| Sandstone concrete.....   | Cubic yds... | 5,400              | 1·000     | 5,400  | 6,277         |
| Rendering.....            | Square yds.  | 16,200             | 0·054     | 874    |               |
| Brickwork, 1 ring .....   | Cubic yds... | 9                  | 0·311     | 3      |               |
| <b>Total Casks .....</b>  | .....        | .....              | .....     | .....  | <b>44,740</b> |

The Inspectors' returns, in so far as they are available, and when not available, adopting the foregoing calculated quantity for the same contracts, give 44,630 casks, as follows :—

|                      |        |                    |
|----------------------|--------|--------------------|
| Contract No. 53..... | Casks. | 3,103 <sup>+</sup> |
| Do 56.....           |        | 1,607*             |
| Do 60.....           |        | 404*               |
| Do 61.....           |        | 771 <sup>c</sup>   |
| Do 65.....           |        | 5,132              |
| Do 69.....           |        | 7,965 <sup>½</sup> |
| Do 72.....           |        | 9,422              |
| Do 77.....           |        | 2,940              |
| Do 79.....           |        | 5,384 <sup>½</sup> |
| Do 79a.....          |        | 2,269              |
| Do 118.....          |        | 5,632              |
| <b>Total.....</b>    |        | <b>44,630</b>      |

J. DAVIS, 25/9/ 6.

19312. In regard to the supervision of the three contracts which have been specially referred to by Mr. Parkes in connection with the question of the shortage of cement—I mean Contracts 69, 79, and 79A—you have had prepared a list showing who were the engineers and inspectors engaged upon those contracts? Yes.

19313. The list shows the dates of the appointments, and for how long they were held? Yes; as far as it is possible to ascertain the dates from the books. The list is as follows:—

J. Davis.  
25 Sept., 1896.

## SEWERAGE Construction Branch.—Officers employed on Contracts Nos. 69, 79, and 79A.

| Name.                    | Position.               | When engaged.                     |
|--------------------------|-------------------------|-----------------------------------|
| <i>Contract No. 69.</i>  |                         |                                   |
| Mr. Millner .....        | Resident Engineer ..... | From commencement to April, 1895. |
| Mr. Gibbs .....          | Inspector .....         | „ April, 1895, to completion.     |
| Mr. Tudgay .....         | Inspector .....         |                                   |
| Mr. Husband .....        | „ .....                 |                                   |
| Mr. Eyre .....           | „ .....                 |                                   |
| <i>Contract No. 79.</i>  |                         |                                   |
| Mr. Boys .....           | Resident Engineer ..... | From beginning to end.            |
| Mr. Weedon .....         | „ .....                 | Relieved Mr. Boys once or twice.  |
| Mr. Fowle .....          | Inspector .....         | January, 1893.                    |
| Mr. Parsons .....        | „ .....                 |                                   |
| Mr. Wagg .....           | „ .....                 |                                   |
| Mr. Loughheed .....      | „ .....                 | February, 1894.                   |
| Mr. Harris .....         | „ .....                 |                                   |
| Mr. Eyre .....           | „ .....                 |                                   |
| Mr. Reid .....           | „ .....                 | November 18th, 1893 (started).    |
| Mr. Vincent .....        | „ .....                 | „ „ „                             |
| <i>Contract No. 79A.</i> |                         |                                   |
| Mr. Boys .....           | Resident Engineer ..... | From commencement to March, 1895. |
| Mr. Weedon .....         | „ .....                 | „ March, 1895, to April, 1895.    |
| Mr. Cook .....           | „ .....                 | „ April, 1895, to end.            |
| Mr. Fowle .....          | Inspector .....         | January, 1895.                    |
| Mr. Andrews .....        | „ .....                 | October, 1895.                    |
| Mr. Broom .....          | „ .....                 |                                   |
| Mr. Board .....          | „ .....                 | January, 1896.                    |
| Mr. Eyre .....           | „ .....                 |                                   |
| Mr. Parsons .....        | „ .....                 | October, 1894.                    |
| Mr. Inwood .....         | „ .....                 | January, 1895.                    |

19314. You have every confidence in the officers whose names appear in that list? Yes.

19315. And you have every reason to believe that the utmost care was taken in the supervision of these three contracts? I am satisfied that that was the case.

19316. I suppose this particular question as to the quantity of cement which is used, is one to which great attention is paid? I think it is evident from the information which I have just given—namely, that we are able to look back for six years and say precisely to pretty well half a cask what cement has been used—if allowance be made for the difficulty in collecting the information for the returns—I think that shows pretty clearly that we have exercised considerable care, not only as regards the quality of the cement used, but also as to the quantity used. The facts which I have just read out tally with what has occurred upon other contracts which have not been let to these contractors.

19317. *Mr. Gummow.*] Did you obtain the same particulars with regard to other contracts? Yes.

19318. Have you any particulars, for instance, as to the contracts of Mr. M'Sweeney, Mr. Carson, Mr. Ahearne, Mr. Gilliver, and Messrs. Phillips and Rhodes—can you give me any particulars at all in the case of those contracts? I could not give you them all, but I can give you some. Take Mr. Gilliver's contract for instance. There has been a correct tally kept in the case of his work at Coogee, and also at Parramatta. In the Coogee work a cask of cement made in sandstone concrete 28½ cubic feet, and in the Parramatta contract 26½ cubic feet. I should explain that in the Parramatta contract rather a different material was used; I believe it was pebbles, not sandstone. There were the same proportions, but the difference in material would make a slight difference. I know that in the case of Mr. M'Sweeney's Contract 62, a very similar contract to those carried out by Carter, Gummow, & Co., and Carter & Co., the amount being £60,000, and 17,000 casks of cement being used, the cement came to precisely the quantity upon which I have based my calculation.

19319. In making up the details of these calculations, do you find that the batches vary very much? Considerably. It depends entirely upon the kind of work you are carrying out as to what a cask of cement will make. In some instances a cask of cement made more than I have put down, but I have tried to arrive at a basis which can be relied upon—which we can stand by.

19320. Can you say how far a batch has gone? To over 30 feet.

19321. How do you explain that? Well, Carter & Co.'s, and Carter, Gummow, & Co.'s works have been partly tunnels and partly storm-water channels; and in that context it is necessary to bear in mind that in the case of storm-water channels a cask of cement will make less than in tunnels, in consequence of the concrete having to be put into the tunnels in a horizontal position. If you take a storm-water channel you will probably get from 26 to 27 cubic feet to a cask in sandstone concrete. If you take a tunnel it will go over 30 feet. For that reason and the other reasons I have given I have taken 27 feet, so that we may be able to stand by the estimate.

19322. Your estimate that a cask of cement will go from 27 feet up to 30 feet applies to other contractors? Yes.

19323. The varying conditions of the metal make a great difference? They make all the difference.

19324. To say nothing of the dampness and position of the concrete? Yes; there are so many things to be taken into consideration. You may make half a dozen batches of concrete and you will find they will all vary one from the other. Suppose you start upon a heap of metal, and you make your first gauge from the tail end, you get all the large stone; that would not make so much as it will make when you get into the heart of the metal and put the smaller stuff into the box with the larger stone. You will find that when you get into the heart of the metal it will make from 15 to 20 per cent. more concrete per cask than your first gauging.

- J. Davis. 19325. You state that you cannot get within from 15 to 20 per cent., having regard to the varying conditions, of the exact quantity which a batch will make? I am perfectly satisfied that you cannot.
- 25 Sept., 1896. 19326. *Mr. Parkes.*] When did you start making this comparison between the cement delivered and the cement put into the work;—when did you make these tests? I have made no tests. I heard that one was made. I believe that Carter, Gummow, & Co. made one in the presence of one of our inspectors. I believe that a cask of cement made 29 feet in the case of sandstone concrete, but I have made no tests myself.
19327. Did the inspector upon McSweeney's job not make a test? I know nothing of it.
19328. Did he not make a test? I do not know. I know that I have made none myself. I should regard tests in a matter of this sort as utterly ridiculous.
19329. Did you ever make any calculations of this kind before this Commission sat? Yes; when I had immediate charge of work. I was then on the works constantly, and I always kept a check of the quantity of cement used for my own information.
19330. On the basis you have given? Yes. I repeat that the quantity made depends very much upon the conditions and circumstances under which you use the concrete.
19331. Did you keep the tally you have spoken of on a basis of this sort—that a cask of cement would make 27 feet in the case of sandstone, and 22 feet in the case of bluestone concrete? From my experience I consider that I have estimated the quantity very low, taking all things into consideration.
19332. As to the minutes relating to Contract 72, and the quantity of cement which was supposed to be there, have you the original minutes? I believe they are in my room, but I am not sure. There are no other minutes besides those which I have read, except that Mr. Hickson has written two or three words which do not appear to have any connection with the matter.
19333. There is a minute also by Mr. Bagge and several others. In the absence of the original, will you accept Mr. Christie's copy as correct? Yes.
19334. Did you make up your returns in respect of Contracts 69, 79, and 79a from the material in the final vouchers? Yes.
19335. Did you take cognisance of the cement rendering? Yes.
19336. That is in your list? Yes.
19337. *His Honor.*] The specimen of the concrete which has been exhibited to the Commission, and which was taken from the Alexandria contract, I understand you to say is a good average sample of bluestone concrete? Yes. In some cases the stone would be a little finer than that—in fact, I believe it was so on that job. I think one witness said that it was. I remember at the time the work was constructed that stone was being got from Emu Plains, and was crushed at Newtown. It was particularly fine. This is rather a coarse sample.
19338. Would this particular piece of concrete be rammed more lightly than usual on account of its being put on to a bad bottom? No; I think that is a fair sample of the ramming it gets. It is very difficult to ram concrete at all if you make it wet, because the moment you begin to ram the water comes to the surface and you have to stop.
19339. If you look at this sample with a glass you will see that it is like a sponge; it appears to be full of air bubbles? That is the case with all concrete, and it must necessarily be so on account of the superabundance of water you have to put into it. This takes up a certain amount of space, and when it evaporates holes are left.
19340. Are not these small holes to be accounted for by the air? No; by the water, I think. It requires very little water to crystallise cement—not more than one-half of what you would put into concrete.
19341. At any rate something, whether it be water or air, finally causes the concrete to take the form of a sponge? That is so.
19342. And the varying quantity of that would determine the varying bulk—that is where the variation would probably come in? It might come in in that sense, but it will come in more especially in connection with the size of the stone.
19343. A good deal depends upon the pressure which can be put on, and the extent to which the compo. can be squeezed in between the stones effectively—upon the pressure put upon every part of the compo.? Yes.
19344. You would not have actual cavities, but in different pieces of concrete you would have varying sizes of bubbles? Yes. If you put in concrete dry it is very difficult to get the compo. distributed, and you will find a patch of compo. with very few stones in it, and another patch where there is very little compo., and where it is very nearly all stone. That is the case in the packing over the arch of tunnels, where you cannot put in a large quantity of water; if you did, when the centres were struck the water would run out of the concrete, and would wash out the joints of the brickwork. Consequently the concrete has to be put in dry. That being so, the concrete over the arch of tunnels would not be so solid as elsewhere.
19345. It would be very spongy? Very spongy indeed.
19346. Have you examined compo. to ascertain whether it contains scarcely-perceptible bubbles? Compo., where the minimum quantity of water is put in, can be made practically solid. There will be few, if any, small bubbles. But compo. made of the consistency in which it is used by bricklayers and plasterers would almost always contain a greater or less number of small bubbles.
19347. What is the case with 3 to 1 compo.? I made an experiment, if it can be called an experiment, which did not quite tally with our experience. I found from that experiment that 13 feet of sand and a cask of cement could be rammed without much trouble to 11½ feet, so that the 13 feet of sand, plus the 4½ feet of cement, came down to 11½ feet.
19348. But experience brings the matter back to what you said—that it is to a great extent the mechanical action of the stone in the concrete which prevents you from bringing it down to the condition to which compo. is brought? Yes, that is so.
19349. *Mr. Smith.*] The clause relating to payment was clause 23 in the old conditions, and it is now 30? It would appear from the minutes of the Board of Reference of the 21st September, 1891, that the Board proceeded with the further revision of the draft general conditions. Clauses 16 to 23 were dealt with according to the minutes, and the Board then adjourned. On 28th September, 1891, the next meeting of the Board, there is this entry:—"General conditions of contracts. The Board then proceeded with the revision of the draft general conditions. Clauses 24 to the end were dealt with, and the order of the clauses rearranged." The Secretary was directed to have the corrections made, and submit a revised

19350. *His Honor.*] Have you found the meeting at which the revised copy was submitted? The next entry in the minute-book referring to the matter is under date of 11th November, 1891, and is as follows:—"General Conditions of Contract. Messrs. Barling and Darley were authorised to finally revise the draft clauses which had been prepared, and thereafter submit them for the consideration of the Crown Solicitor for his advice." The matter would then probably go to the Crown Solicitor. I have endeavoured to ascertain this morning, as far as I could, when it was that the new general conditions were first incorporated in the sewerage contracts. I find that some five or six months before the Minister approved of the general conditions as a whole they were being used. J. Davis.  
25 Sept., 1896.
19351. *Mr. Smith.*] Here is the tender of one Blair, dated 9th May, 1893, in the Roads and Bridges Branch. The contract appears to contain clause 30 of the general conditions? Yes; the new general conditions were attached to that contract. The reason that they were not incorporated in the sewerage contracts sooner than they were was simply that the sewerage works were suspended. The first contract in which the new general conditions appeared would be about October, 1893, I think, so far as those works were concerned.
19352. So that although in sewerage contracts the payment clause appears to be No. 18, it is quite clear that clause 23, mentioned in the Board's minutes of September, refers to the payment clause, that being the number used in the Harbours and Rivers, Military Works, Railway Construction, and Water Supply and Sewerage contracts? Yes; at the time the Board of Reference took this work in hand every branch was using its own general conditions. The object, as I understand from the Minister's minute, was that one set of general conditions should be used throughout the Department.
19353. *Mr. Parkes.*] Are the minutes you have quoted entered up in a new book, or is that the book which has been used right through? This book is the one which has been used by the Board of Reference from 2nd February, 1891. That was the first meeting of the Board of Reference after its constitution by Mr. Bruce Smith's minute.
19354. To what date does that run? The last entry in this book is under date of 10th May, 1895. There is another book in use now.

Henry Johnston sworn and examined:—

19355. *Mr. Parkes.*] What are you? Foreman for John Molloy, carter. H. Johnston.  
25 Sept., 1896.
19356. Do you yourself cart, or do you supervise the carting? I supervise the carting and the men.
19357. Do you keep complete records of the places to and from which you cart? The clerk in the office does that. I do all the outside work.
19358. On 10th July, 1894, some cement was carted from Carter, Gummow, & Co.'s works to M'Ilwraith's wharf—practically back to Parbury, Henty, & Co.'s? To M'Ilwraith's wharf.
19359. Back to Parbury, Henty, & Co.'s? To M'Ilwraith's wharf, on account of Parbury, Henty, & Co.
19360. Do you recollect how many casks there were? I could not say from memory. It is a good while back.
19361. You have your books with you? Yes.
19362. You could tell us from them, could you not? There is this entry:—"66, Carter, Marrickville, 10th July, to M'Ilwraith's wharf." Then on the 11th there is also "40, Carter"; on the 13th again "44"; and again on 4th August, "62, Carter & Co." That does not state Marrickville, but the others do.
19363. Was that last number not carted from Marrickville? I could not say for certain. It might have been that the cement was going from Marrickville. Probably it would be.
19364. The accounts would show where it was carried from? They would give you no more information than I have already given you. It would be the same as is contained in this book.
19365. But would they not show the places to and from which the cement was carted? No.
19366. Will you read the particulars of the accounts? Sixty-six on the 10th, Carter & Co., Marrickville, to M'Ilwraith's Wharf; on the 11th, 40; on the 13th, 44.
19367. Look at the account from 4th August to 8th August? That is 62, Carter & Co. to North Coast Company; 24, Carter & Co. to Hogg & Co.; 12, Carter & Co., Railway—that would be Darling Harbour. The entry shows you, as you see, where the cement went to, but it does not say where it came from.
19368. Between 6th and 21st September there were fifty casks—where was that carted from? I cannot say.
19369. What about the 442 casks? That was carted to M'Ilwraith's wharf.
19370. Where was it carted from? It simply says, "Carter & Co."
19371. But where was it from? It does not state.
19372. The charge was 5d? Yes.
19373. And the charge on 10th July was also 5d.? Yes.
19374. Would not that lead you to suppose where the cement on the latter date came from? There were different contracts going on, and I cannot say positively where it did come from.
19375. At that particular time were you carting from any other place beside Marrickville? Not backwards.
19376. But for Carter & Co. I mean? I was not doing it for Carter & Co.
19377. Not for Parbury, Henty, & Co.? No; I do not think I was carting for them from any other place.
19378. Did you cart from any other contract of Carter & Co.'s but Marrickville at that time? No; I do not think so. I think that was the job from which we were carting at that time, but I cannot be sure.
19379. That is the only contract from which you were carting at that time? I think so.
19380. Have you in your employ any of the men who carted any of this cement? I could not say, speaking from memory.
19381. Do the entries to which I have referred you make a total of 832 casks? I could not say; I have not made it up.
19382. The list of figures I hand you tallies with your books, and is correct? Yes; it makes 832.
19383. It was all carted pretty close to one date;—that is, between July and September? Yes.
19384. And it could not have been carted from any other place but Marrickville? It might have been.
19385. But you were not carting from any other place but Marrickville at that time, were you? Not backwards.
- 19386-7. *Mr. Gummow.*] How many of the casks to which you have referred can you say definitely from your

- H. Johnston. your books came from Marrickville? The sixty-six, the forty, and the forty-four, under the dates 10th, 11th, and 13th, July, respectively.  
 25 Sept., 1896. 19388. So that there are 600 odd out of the 832 concerning which you cannot say definitely where they were carted from? No.  
 19389. Did you tell anyone that they came from Marrickville? I told Mr. Christie that they might have come from Marrickville.  
 19390. But you did not say definitely that they did? No.  
 19391. Your books do not show it definitely? No.

Charles James Henty recalled and further examined:—

- C. J. Henty. 19392. *His Honor.*] You wish to make a statement? Yes; there would appear to be a mistake of 150 casks in the total of 832, according to the books which have been produced. There are 150 casks which Molloy says definitely came from Marrickville. I think it is only right to say, in fairness to Mr. Holden, who made out these particulars, and I think Mr. Christie will bear me out in what I am saying, that, the "Talavera" being at M'Ilwraith's wharf, we sent him down to the wharf to make inquiries about these returns. I do not think he made inquiries of Molloy as to the returns.

John Carter recalled and further examined:—

- J. Carter. 19393. *Mr. Gummow.*] You heard Mr. Davis' evidence this morning as to the cement on the general contracts that you have had from 1890? Yes.  
 25 Sept., 1896. 19394. Have you interested yourself in finding out from your bank pass-books how much cement you think you have had during that time;—what do you consider that you have had? About 48,000 casks is our number.  
 19395. Delivered generally all over your works? Yes.  
 19396. *His Honor.*] Within what time? From the inception of our business up to the 30th June, 1896. That would apply to Carter & Co. and Carter, Gummow, & Co.  
 19397. *Mr. Davis.*] Your calculation covers the same term as does my statement? Yes.  
 19398. That would be from the 1st January, 1890, to the 30th June, 1896? Yes.  
 19399. *Mr. Gummow.*] That is the cement which has been used on your Government contracts? Yes.  
 19400. There are some exceptions, are there not—there is some cement, for instance, which you sold;—do you remember that? Yes, we sold to several persons.  
 19401. Do you remember any instances? We sold some to Danaher & Co., railway contractors, also to Flood and Rutherford, Wilmot and Morgan, and Gummow and Gillan.  
 19402. Where did you get those particulars from? From our bank pass-books.  
 19403. Do you know anything about the cartage from one contract to another as a general thing? Yes; I have already stated that it is a common practice with our firm to cart cement in large quantities from one contract to another simply for the expeditious carrying out of the work. It very often happens that, through the failure to pass of a parcel of cement which has been stored on one contract, we have carted large quantities of cement from other contracts which we have had in hand in order to keep that particular contract going. It is a very risky matter when you have an open channel, such as a stormwater channel, to leave it standing waiting for cement to pass. We have always found that it has paid us better to cart cement to the job, irrespective of the cost, from the nearest available store.  
 19404. Have you ever heard, in connection with your contracts, of the men waiting on material, as it is called—that is to say, if they did not see a sufficient quantity of material on the ground they would not push on very hard, would they? Quite so. If there is a big stock of cement, for instance, the men work away energetically. If they find that the supply is from hand to mouth, they naturally slacken up. It is always to our advantage, therefore, to keep a good stock in hand. The men, naturally, do not like to be stood off for two or three days waiting for cement.

Frank Moorhouse Gummow sworn and examined:—

- F. M. Gummow. 19405. *Mr. Andrews.*] You are a Civil Engineer? Yes.  
 25 Sept., 1896. 19406. You are a C.E. of the Melbourne University? Yes.  
 19407. That was the highest degree in engineering conferred by the University? Yes; it was.  
 19408. Have you had any practical experience as a Civil Engineer? Yes; it is thirteen years since I passed.  
 19409. Have there been any Government contracts in New South Wales with which you have been connected as an engineer, apart from the contracts of Carter, Gummow, & Co.? Yes; I was on contract No. 7, the Bondi sewer. That was for £186,000, I think. I was 21 when I went to that work. They paid me £520 a year.  
 19410. When did you first have any connection with the Government as a contractor? Either in 1886 or 1887—I am not quite sure of the year. I first tendered for a work with Mr. Rochester, at Belmore Park. I never had anything to do with the contract, because I retired from it before it commenced.  
 19411. What was the next contract you had? The Hyde Park sewer. Then we had the excavation of the Potts' Hill reservoir. We also did the sewer down Castlereagh-street to Macquarie-street, and the sewer through Camperdown, and also at Potts' Point.  
 19412. As to the Potts' Hill reservoir, had the contractors anything to do with the concrete at the bottom of that? Nothing whatever.  
 19413. So that Mr. Parkes was in error when he stated that the concrete which your firm put into the bottom of the Potts' Hill reservoir was defective. You will see his statement on page 32 of *Hansard* of the present session? We did not put any bottom in the Potts' Hill reservoir at all.  
 19414. It was not put in by reason of defective work? No; we merely did the excavation for the contract.  
 19415. *Mr. Parkes.*] And the embankment? Yes.  
 19416. *Mr. Andrews.*] What was your first connection with the firm of Carter & Co.? In the Adelaide contract, in August, 1892.  
 19417.

19417. You sent in a joint protest with Carter & Co. as to the acceptance of Bond and Hudson's tender for Contract 79? Yes. (*Vide Appendix No. 70.*)

19418. Will you explain why you did that? Gummow and Gillan, a separate firm from Carter & Co., tendered for Contract 56 at Woolloomooloo. Bond and Hudson were the lowest tenderers, and Gummow and Gillan were the second. Bond and Hudson were much lower than Gummow and Gillan in their tendering. For some reason they refused to take up the work; and fresh tenders were called, Carter & Co. finally getting the work, and Gummow and Gillan running second again; we felt very sore, the whole of our prices having been exposed, at the idea of the Government not giving us a chance to take up the contract when Bond and Hudson threw it up. When 79 was tendered for Carter & Co. were second to Bond & Hudson. Mr. Carter came to me, and he said "You were very sore over not getting that contract at Woolloomooloo. Will you join us in writing a letter of protest in connection with Contract 79." I said I certainly would, and that I did not think it right that men should put in tenders, throw them up, and then probably exercise some influence to get back their preliminary deposit. I told him I was quite prepared to join him in writing a letter pointing to that effect, and suggesting either that that practice should be stopped, or that a stop should be put to the practice of showing everyone's prices, that not being fair play. We therefore signed a letter of protest. I think I wrote it.

19419. Up to that time neither you nor Mr. Gillan had had any connection with Carter & Co.? No; as far as Contract 79 was concerned it made no difference whether Carter & Co. or any other firm got it; but we felt sore at the idea of Bond and Hudson, who had upset us on a previous occasion, acting as they were doing, and that was really the reason.

19420. When you obtained the Adelaide contract you undertook the personal supervision of it? Yes; with Mr. Gillan.

19421. And from that date up to eighteen months ago you exercised no personal supervision in respect of any contracts in New South Wales? No, none.

19422. What was the first New South Wales contract in which you were interested as a member of the firm of Carter, Gummow, & Co.? The Marrickville contract—No. 69.

19423. Did you prepare the estimate or tender? No.

19424. Was it ever submitted to you in detail before it was sent in? No; I never saw it before it went in. A week or so afterwards Mr. Snodgrass sent me down a copy of the tender, but I did not know about the prices, or indeed anything about it, before it went in.

19425. Between the time of the tenders going in and the present time, you have had an opportunity to look through the schedule? Yes. I have looked through the items.

19426. *His Honor.*] Do you consider the schedule a risky one in respect to some of the items? No, not as a contract. I presume you mean by a risky tender a tender where there would be a chance of loss?

19427. I mean a gambling one? It is speculative as to how much profit we should make. No one could tell when we put in the tender what amount of profit we should make out of it.

19428. *Mr. Andrews.*] Is not that the case in all tenders? Certainly.

19429. *His Honor.*] Only this tender was exceptionally speculative in regard to some of its items? I cannot say that, except in regard to one item, it was very speculative. The item as to bluestone pitchers is speculative, but there is no risk attached to that.

19430. *Mr. Andrews.*] What I wish you to explain is this—there are a number of items in the schedule which are apparently absurd—for instance, there are subducts, 1d., timbering at 1d.;—there are various items of that kind, and I want you to explain how it is that, in your opinion, these items are not absurd? Take the first four items—they are all put down at one price. They relate to open trenches. In respect of those items there is possibly a risk, on paper; but as we had all the borings and brickholes in the vicinity to go by, it was plain to anyone putting in a tender that the ratio of quantities could not be very much astray, and even if you did strike more rock than was anticipated, the difference in price between the rock and the soft ground is not a very large item in 2,000 or 3,000 yards. As to item No. 5, it must be taken in conjunction with item No. 21 and item 32. These three items depend one upon the other, because, in a large tunnel like this, if it is in soft ground it needs timbering, and if you put the timber in you cannot take it out. It is probable that in making up the price of No. 5 the cost of the timber was put on to the excavation price and kept off item 21. Then again item 32 can be done cheaply because you have a large body of concrete to put in in a large excavation. It is probable then that the price of bluestone concrete in item 32 was kept down, and an extra profit put on to item No. 5. As to item No. 6, our experience as contractors has told us that the department do not go in for guttering and gadding if they can get the work done in any other way, and unless there are very strong reasons for doing it by guttering and gadding. Item 7 is avoided on account of the extra cost of supervision—at least that has been our experience. Item No. 8 is the usual way of carrying out the work. The same reasoning applies to items 9, 10, and 11, as applies to 6, 7, and 8. And again with regard to the whole of the items 9, 10, and 11, disputes often arise between the department and contractors as to what is rock and what is not rock. It is a difficult question to settle, and if possible we endeavoured to keep our prices the same for soft as for hard, in order to avoid any unpleasantness. As to items 12, 13, 14, and 15, there is no doubt that the person who made up the tender considered that these quantities were excessive, and how the Government arrived at them we do not know. It is plain to see from the plan that they were excessive; and the prices were kept very low. If the shafts had been made very large then the cost of excavating would be greatly decreased per cubic yard, and there is nothing to show that they would have been greatly increased. Undoubtedly the prices have been kept down on account of the excessive quantities shown. As to item No. 16, from the price put in no doubt Mr. Snodgrass must have anticipated an increase in the quantity over and above that shown. In this matter the department cannot assist you in any way. You cannot be absolutely sure of your figures. It would depend upon what the ground is when you opened it up how the quantities turned out. You can only judge it from local experience. I do not know whether His Honor would like me to go through the whole schedule.

19431. *His Honor.*] Take the items to which you wish specially to call attention? As to items 17, 18, and 19, the same reasoning applies to them as applies to items 12 to 15. Item 21 depends upon item 5. If item 5 is greatly enlarged item 21 has to be enlarged. There is no doubt there was a great deal more of item No. 5 than was anticipated by the department. If item No. 5 had been greatly reduced there would have been very little of item 21. Item 21 depends absolutely upon item 5. As to the subducts,  
items

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items 23 to 27, you cannot have those items used unless the items 5 to 11 are used, or unless some of those items are used. The use of subducts depends upon the excavation, and the price of our excavation for subducts would more than compensate for the cost of the excavation and the cost of the subducts, so that if the whole contract from end to end had had subducts in it we should have made, rather than lost, money upon that item. Item No. 32, bluestone concrete, is below the Government estimate, but it is a good deal above the real cost. Then, again, you cannot have an increase in the bluestone concrete unless you have an increase of excavation. Therefore the prices which have been put in for excavation have to be considered. Cement facing is put down at a high price. Looking at the plan, and judging from what Mr. Snodgrass informed me, he anticipated there would be an increase of cement rendering. Our experience had been that sewers are rendered all round. The plans for Contract 69 showed rendering up to the springing only, or at any rate the cement rendering would be brought higher up the sides, even if it were not brought right round, so that it was anticipated that this would be probably an increased quantity from our previous experience of works. The question of bluestone pitchers was undoubtedly a mistake in the department, and from what I can learn and see Mr. Snodgrass took advantage of it. He knew that there must be 12 yards of pitchers, and that, according to the plans, there must be considerably more. As to item 43, the removal of material, our experience has shown that we can get a great deal of it carted away for nothing. The Government do not require it, or have not required it, upon a number of contracts. The price is put down low because it often costs very little to get it removed. Councils and other bodies are always very glad to get it. Item 44 is seldom used. That is why a low price is probably put down there. In looking through the schedule, it is apparent that the bulk of the profit has been put on to the excavation, the cement rendering, and the pitchers, so that items 46 to 85 were put in at the cost price which was charged us by Mort's Dock Co. These items represent about £10,000. That would be the amount charged by Mort's Dock Co. to us, and we put all that in for the £10,000. There is no profit there. There is actually a loss for fixing. I think that is all which it is necessary for me to say as to the schedule.

19432. Now, bearing that explanation in mind, do you, as a civil engineer, think that the Government would have been justified in refusing to accept that tender simply by reason of the charge for bluestone pitchers? Certainly not.

19433. If you were in private practice, would you recommend a client to reject it by reason of such a charge? No. If I made up a specification and schedule I would stand by it. It is handed to the contractor to put in his prices against the quantities, which are probably correct, as far as you know, at the time. If a contractor takes to speculation, that is his risk. He may make an error, and may have to pay for it instead of making any gain. In tendering for work about which I do not know as much as I do of sewerage work, I tender, as a rule, at a fair cost and profit on each item. I do not know sufficient of the work, and the probabilities of the carrying out of the work, to take to speculation. In sewerage works, however, Mr. Snodgrass and I had more experience than had anyone else in the Colony, and we took to speculation.

19434. Could any information given by any officer in the department have helped Mr. Snodgrass in any way in the making out of the tender? Certainly not.

19435. Would it be of any assistance to contractors, under any circumstances, to get information from any officer in the department? That is rather a general question. I do not know of any case where any benefit could arise. The plans and schedules are made in the office by the office hands, and the work is carried out under different circumstances. You do not know who will be the supervising engineer before your tender goes in. You do not know also what inspectors you are going to get. Some engineers have great ideas of brickwork, and others again are great believers in concrete. One man will say one-ring work is good enough where another will require two-ring work. There are all those questions to be considered, but they do not come in when you are putting in your tender.

19436. So that any information which you might receive from an officer of the department you do not think would help you in the putting in of your tender? No; we pride ourselves that we know more than do the Government officers when we are going to tender.

19437. Had you any connection with Contract 79A—the North Shore Extension? Not as far as the Government were concerned, but I had privately. It was an extension of Carter & Co.'s Contract 79, and I had nothing to do with that. When Carter & Co. got the contract, however, they handed it over to Carter, Gummow, & Co. to work, and take the risk or profit, whatever it might be. Personally I had nothing to do with it, but I was a shareholder as far as the commercial world was concerned.

19438. You consider that the contractors are the persons only who sign the tender? Yes; I have always been led to believe that by the department. I have had experience as an engineer on contracts, and I have been told by Government officers that they could put me off in twenty-four hours if they liked—that I was nobody as far as they were concerned—that they could shift anybody—that they dealt only with those who had the contract, and that they recognised no one behind the scenes.

19439. Did you make up the estimate for Contract 77? With Mr. Snodgrass, yes. I ought to explain that there were seventeen main arches. I took the cost of four as my data, and when I found that they practically agreed day by day I did not bother any more. I thought I could tell from that what the cost of the other thirteen were.

19440. *His Honor.*] You assumed that the cost of the four would give you a fair average? Yes. I ought also to explain that the men were working eight and a-half hours a day and saving their Saturday. The arches at White's Creek are a little bit smaller in width, there being a smaller-sized sewer there, than are the arches at Johnstone's Creek. The quantity of 1,325 yards is not the whole total of the concrete and compo., but the estimate which I made as to the four arches at White's Creek. That would make a small difference. There may be 25 or 30 yards of concrete more than I have considered in my calculation. As to the blacksmith's work, it is almost impossible to get that item exactly, because the blacksmith is engaged in sharpening tools, drills, picks, and that sort of thing, as well as doing other work. He also has two men to assist him.

19441. *Mr. Andrews.*] When were the figures upon which your calculation is founded taken by you? At the time the work was going on.

19442. How long ago was it? In February or March.

19443. Before this Commission was granted? Yes.

19444. And it was taken really for your own information? Yes.

19445. Under the departmental and Monier designs? Yes.

19446.



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19446. You have been in charge of that contract from the start? I have been on it. My position was this: Mr. Snodgrass had charge of 77 up to the end of last year. My connection has been more in the nature of a consulting engineer giving any assistance I could and attending to Adelaide affairs. Mine has been a roving commission. Mr. Forrest has since been in charge of the contract, and I have assisted him and consulted him in any matter in which he had need of my advice.

19447. Did you, for your own information, during the progress of the work, check the cost of the Monier portion of it? Yes.

19448. Will you tell us what you make the actual cost of the Monier work to be per yard? What I did was this: when an arch was to be turned, I would be there all day to see how long the men worked. I knew what the men were getting, and how many cubic yards there were in the arch, and, knowing that, I was able to get at the cost of an arch. The same applies to the jack arches. I used to watch them, and if I were not there during the whole time myself, I asked Mr. Forrest to make a note of the time the men were employed. I did not keep an exact cost of the work from day to day, but I wanted to know how things were going, and what the work was actually costing a yard.

19449. The result of your checking was what? I have made up a statement; it is as follows:—

CONTRACT No 77.—Monier Structure.

| <i>Concrete and Compo.—</i>   |  | £                             | s. | d.       |
|---|--|-------------------------------|----|----------|
| 17 main arches at 24.5 cb. yds. = 416.5 cb. yds. at 4/3 .....                               |  | 88                            | 10 | 0        |
| 1 man at 9/- = 9/-  |  |                               |    |          |
| 1   "   8/6 = 8/6   |  |                               |    |          |
| 4 men at 8/- = 32/-   |  |                               |    |          |
| 7   "   7/- = 49/-  |  |                               |    |          |
| £4/18/6 for 8 hours a day ;   |  |                               |    |          |
| " 8½ " = £5/4/8 ;   |  |                               |    |          |
| or, per cb. yd. = $\frac{£5/4/8}{24.5} = 4/3.$  |  |                               |    |          |
| 25 sets spandrils and piers at 13.33 cb. yds. = 333.3 cb. yds. at 4/4 .....                 |  | 72                            | 4  | 4        |
| 1 man at 9/- = 9/-  |  |                               |    |          |
| 1   "   8/6 = 8/6   |  |                               |    |          |
| 2 men at 8/- = 16/-   |  |                               |    |          |
| 3   "   7/- = 21/-  |  |                               |    |          |
| £2/14/6 for 8 hours a day ;   |  |                               |    |          |
| " 8½ " = £2/17/11 ;   |  |                               |    |          |
| or, per cb. yd. = $\frac{£2/17/11}{13.33} = 4/4.$   |  |                               |    |          |
| 25 lengths of main carrier at 20.5 cb. yds. = 512.5 cb. yds., at 5/7 .....                  |  | 143                           | 1  | 5        |
| 1 man at 9/- = 9/-  |  |                               |    |          |
| 1   "   8/6 = 8/6   |  |                               |    |          |
| 4   "   8/- = 32/-  |  |                               |    |          |
| 7   "   7/- = 49/-  |  |                               |    |          |
| 1 horse at 9/- = 9/-  |  |                               |    |          |
| £5/7/6 at 8 hours a day ;   |  |                               |    |          |
| " 8½ " = £5/14/2 ;  |  |                               |    |          |
| or, per cb. yd. = $\frac{£5/14/2}{20.5} = 5/7.$   |  |                               |    |          |
| 25 lengths of cover plates at 2.5 cb. yds. = 62.5 cb. yds. at 13/10.....                    |  | 43                            | 4  | 7        |
| 1 man at 9/-  |  |                               |    |          |
| 1   "   8/6   |  |                               |    |          |
| 1   "   8/-   |  |                               |    |          |
| 1   "   7/-   |  |                               |    |          |
| £1/12/6 at 8 hours a day ;  |  |                               |    |          |
| " 8½ " = £1/14/6 ;  |  |                               |    |          |
| or, per cb. yd. = $\frac{£1/14/6}{2.5} = 13/10.$  |  |                               |    |          |
| To put on 25 lengths of cover plates, at 2.5 cubic yards = 62.5 cubic yards, at 41/5 =..... |  | 129                           | 8  | 6        |
| 1 man, at 9/- for 3 days = 27/-   |  |                               |    |          |
| 1   "   8/6   " = 25/6  |  |                               |    |          |
| 1   "   8/-   " = 24/-  |  |                               |    |          |
| 1   "   7/-   " = 21/-  |  |                               |    |          |
| £4/17/6 at 8 hours a day ;  |  |                               |    |          |
| " 8½ " = £5/3/7 ;   |  |                               |    |          |
| Or per cubic yard = $\frac{£5/3/7}{2.5} = 41/5.$  |  |                               |    |          |
|   |  | Total, 1,325, cubic yards, at |    | 476 8 10 |
| Or per cubic yard = $\frac{£476/8/10}{1,325} = 7/2.$  |  |                               |    |          |

PER ARCH—IRONWORK.

*Main Arch—*

2 men to tie, at 8/- = 16/-  
2   "   to put on, at 8/- = 16/-

£1/12/- for 8 hours a day ;  
" 8½ " = £1/14/-

*Jack Arches—*

Same number of men and time as main arch = £1/14/-

*Main*

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*Main Carrier—*

2 men 3 days, at 8/- = £2 8/- for 8 hours a day ;  
 „ 8½ „ = £2/11/-  
 Blacksmith „ = £2/16/-

8 15 0

60·83 cubic yards in one complete arch, centre to centre pier, or per cubic yard =  $\frac{£8/15/-}{60·83} = 2/10½$ .

*Timber—*

Six spandril and jack arch timbers—

2 men at 10/-, for 2½ days = £2 10 0  
 1 man at 8/- „ = 1 0 0

At 8 hours a day..... £3 10 0

At 8½ „ ..... 3 14 4½ ..... £ s. d. 3 14 4½

Removing above—

2 men at 10/- = £1 0 0  
 1 man at 8/- = 0 8 0

For 8 hours a day... £1 8 0

For 8½ „ ..... 1 9 9 ..... 1 9 9

Main carrier casing—

2 men at 10/-, for 7 days = £7 0 0  
 1 man at 8/- „ = 2 16 0

At 8 hours a day..... £9 16 0

At 8½ „ ..... 10 8 3 ..... 10 8 3

Removing carrier casing—

2 men at 10/-, for 1½ days = £1 10 0  
 1 man at 8/- „ = 0 12 0

At 8 hours a day ..... £2 2 0

At 8½ „ ..... £2 4 7½ ..... 2 4 7½

Main arch, trestle, lagging, side-boarding—

1 man at 9/-, for 2½ days = £1 2 6

1 „ 8/6 „ = 1 1 3

4 men at 8/- „ = 4 0 0

7 „ 7/- „ = 6 2 6

At 8 hours a day ..... £12 6 3

0 15 6

At 8½ hours a day ... £13 1 9 ..... 13 1 9

Taking down centering of main arch—

1 man at 9/- = £0 9 0

1 „ 8/6 = 0 8 6

4 men at 8/- = 1 12 0

7 „ 7/- = 2 9 0

At 8 hours a day ... £4 18 6

At 8½ „ ... £5 4 8 ..... 5 4 8

Taking down and removing scaffolding—

1 man at 9/- = £0 9 0

1 „ 8/6 = 0 8 6

4 men at 8/- = 1 12 0

2 „ 7/- = 0 14 0

At 8 hours a day ... £3 3 6

At 8½ „ ... £3 7 5½ ..... 3 7 5½

Item of timber spread over 17 sets of arches—

17 × £39 10s. 10½d. = £672 4 10

or per cubic yard..... =  $\frac{672 4 10}{1325} = 10/2$ .

*Cost of Compo—*

1 cubic yard of sand on works = £0 7 0

2 casks of cement „ at 11s. = 1 2 0

£1 9 0

Cost of 1 cubic yard of compo ..... 1 9 0

*Cost of Bluestone Concrete—*

10 cubic feet of bluestone on works ..... = 4/-

6 „ sand „ ..... = 1/9

1 cask of cement „ ..... = 11/-

Cost of 15 cubic feet of bluestone concrete ... = 16/9

Cost of 1 cubic yard of bluestone concrete ..... 1 10 2

Average..... 1 9 10

*Ironwork—*

44 tons of rod-iron of ¾" and ½" diameter and channel iron, at £10 ..... 440 0 0

or per cubic yard =  $\frac{£440}{1325} = 6/7¾$ .

*Plant—*

| <i>Plant—</i>   | £    | s. | d. | F. M.<br>Gummow. |
|---|------|----|----|------------------|
| Half value of two sheds, estimated at £100 .....                            | 50   | 0  | 0  | 25 Sept., 1896.  |
| "    office                    £160 .....                                   | 50   | 0  | 0  |                  |
| "    tools                    £100 .....                                    | 50   | 0  | 0  |                  |
| Barrows, &c., worn out.....   | 20   | 0  | 0  |                  |
| Services of 1 watchman, 52 weeks at £1 16s. ....                            | 93   | 12 | 0  |                  |
| Half value of 2,000 lineal feet of water-pipe, at 2d. per foot .....        | 16   | 13 | 4  |                  |
| Cost of water at 1d. per cubic yard of structure on 1,325 cubic yards ..... | 5    | 10 | 5  |                  |
| or per cubic yard = $\frac{£285\ 15s.\ 9d.}{1325} = 4/3\frac{3}{4}$ .       | £285 | 15 | 9  |                  |

| <i>Cost of Timber—</i>   | £    | s. | d. |
|--|------|----|----|
| Trestles, centres of main arches, boxes of small piers, centres of jack arches, carrier, ribs and laggings inside of carrier, gangway staging, &c..... | 600  | 0  | 0  |
| Value on completion .....  | 50   | 0  | 0  |
| Or per cubic yard = $\frac{£550\ 0\ 0}{1325} = 8/3\frac{1}{2}$ .   | £550 | 0  | 0  |

| <i>Cost of Expansion Joints—</i>                    | £  | s. | d. |
|---|----|----|----|
| Material and labour in putting in place .....       | 50 | 0  | 0  |
| Or per cubic yard = $\frac{£50\ 0\ 0}{1325} = /9$ . |    |    |    |

| <i>Cost of Supervision—</i>   | £    | s. | d. |
|---|------|----|----|
| Assuming that the aqueduct will take twelve months to build, and allowing £300 per annum for salary of an engineer, the cost per cubic yard would be— | £300 | 0  | 0  |
| $\frac{£300\ 0\ 0}{1325} = 4/6$ .   |      |    |    |

*Summary per cubic yard.*

|  |    |    |                  |
|--|----|----|------------------|
| Compo. and concrete .....                      | 1  | 9  | 10               |
| Labour in putting in compo. and concrete ..... | 0  | 7  | 2                |
| Labour in fixing iron .....                    | 0  | 2  | 10 $\frac{1}{2}$ |
| Timber .....                                   | 0  | 8  | 3 $\frac{3}{4}$  |
| Labour for fixing timber .....                 | 0  | 10 | 2                |
| Expansion joints .....                         | 0  | 0  | 9                |
| Supervision .....                              | 0  | 4  | 6                |
| Plant.....                                     | 0  | 4  | 3 $\frac{3}{4}$  |
|  | £3 | 7  | 10 $\frac{3}{4}$ |
| Cost of compo. and concrete .....              | 3  | 7  | 10 $\frac{3}{4}$ |
| Cost of iron .....                             | 0  | 6  | 7 $\frac{3}{4}$  |
|  | £3 | 14 | 6 $\frac{3}{4}$  |

NOTE.—Nothing allowed for profit, guarantee, &c.

MONDAY, 28 SEPTEMBER, 1896.

Frank Moorhouse Gummow recalled and further examined:—

19450. *Mr. Andrews.*] Do you remember how much timber was used for the centerings during the construction of the aqueduct at Johnstone's Creek and White's Creek? I think I have put an amount in for that in my estimate.

19451. For how many centres? Four.

19452. Were they there during the whole of the time the arches were being turned? Yes.

19453. Did you use sandstone from the crusher for the concrete or compo. in connection with the aqueducts in Contract 77? No; we used North Shore quarry sand throughout for that—no sand from the crusher.

19454. No sand whatever from the crusher was used on that job? No.

19455. You used sand from the crusher where? On the storm-water channel—Contract 118.

19456. *His Honor.*] Is the sand from the quarry, which you refer to, sand which would come from stone broken in quarrying, or what sand do you refer to? It is soft sandstone. It is blown down, and in falling it is broken up into sand. What is not broken up in that way is broken by boys with a hammer. The sand is sieved, and would then be sent over to our works.

19457. That would be from the Gas Works? Yes; from the Gas Works' yard at North Shore.

19458. *Mr. Andrews.*] Have you had any practical experience in regard to sand? I have had experience of different kinds of sandstone spreading over the last thirteen years.

19459. Do you consider the sand from North Shore of first-class quality? Undoubtedly. In order that we might arrive at a decision as to the best sand to use we made a number of tests. The sand was put through the Government testing machine to arrive at the best sand for compression, and, in every case, it was shown that the North Shore quarry sand was the best. These tests were made from briquettes or blocks made up for us. We wanted to be satisfied that we were getting the best sand.

19460. You were anxious to obtain the best material possible? Undoubtedly. With regard to the cement, we ordered "Germania" for the first work until we were satisfied that "Hemoor," another German brand, was equally good, and we afterwards used "Hemoor" and "Condor." It was proved from tests, that we made ourselves, that they were splendid cements.

19461. Your firm put in two tenders for Contract 77—one upon the departmental scheme, and the other upon the Monier scheme? Yes.

19462. Assuming that the Government had asked you to carry out the work upon the departmental scheme, was it the intention of the firm to carry it out? Certainly.

19463. Had you any intention at any time of refusing to carry out the works upon the departmental scheme? No; none at all.

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19464. Do you consider that it would have been injurious to you, as a firm, to refuse to carry out the work when you had once obtained it by open tender? I do, most certainly.
19465. Do you know Thomas Williams, the contractor? Yes.
19466. Have you had many conversations with him during the last few years? Very few during the last four years. Probably three or four at the most.
19467. Did you, at any time, tell him that had the Department asked you to carry out 77 upon the Departmental design, you would not have done it? No; certainly not. I am not in the habit of telling Williams, or other contractors, my business.
19468. Did you ever tell him anything which, to your mind, would bear the construction which he apparently placed upon something you said? No; nothing. I have heard of this matter before, and I have read the report of his evidence. The only way in which I can account for the matter arising in his mind is this—that it is his habit, in talking, to put questions and at the same time to suggest the answers. That is the only way in which I can account for his arriving at such a conclusion. It is his natural way of talking. In putting his question, he will suggest his own idea as to what the answer should be.
19469. If Williams stated that a conversation to that effect took place near the stone-crusher, and that Mr. Marr, a traveller for Scrutton, was there at the time, would that be true;—do you remember any conversation with Williams at any time when Mr. Marr was standing near? I remember talking to Williams on an occasion when both he and Marr were at the crusher.
19470. You have no doubt that he is in error in stating that you then told him that your firm would not go on with the contract on the Departmental scheme, if called upon to do so? I am absolutely sure upon that point. I remember the conversation, but I said nothing of that kind. In making up our estimate for the Government design, the prices put in were cost prices. Our idea was to get as low as possible in our tender for the Government design, so that, if we were called upon to go on with it, we could just carry it out without losing any money. We considered that, if we were not the lowest tenderers for the Government design, the Tender Board might not look at our tender upon the Monier design.
19471. So you are sure that you could have carried out the departmental design at the price at which you tendered? Undoubtedly we could.
19472. Although you might not have a profit? Quite so.
19473. You were prepared to give your time rather than have your reputation as contractors affected by your throwing up the contract? Certainly.
19474. You were also in charge of Contract 118? I was generally supervising it.
19475. The unemployed cut a drain so as to take the water away from part of that contract? Yes.
19476. Will you explain to the Commission why the Department cut that drain? Mr. Snodgrass mentioned to me, in the first instance, that we were getting swamped out through the Harbours and Rivers Branch pumping water and sand on to the site of our works, and he suggested to Mr. Carter and myself that we should see the Department, and get them to make an outlet for the water. Mr. Carter, I believe, saw Mr. Hickson. I met Mr. Hickson, Mr. Davis, and Mr. Carter, on the site of the works. They walked over the works, and Mr. Hickson said, "Well, you will have to make the floodgates and fix them, and we will cut the drain necessary to drain off the water."
19477. Was that a risk which you consider you were bound to take under your contract? Certainly not; the risk we took was the risk from natural floods or natural drainage, not water which other persons might choose to put on to the ground. It can be seen now what the use of the channel is; it is an absolute necessity for the drainage of the place.
19478. Do you consider it probable that any contractor when tendering would put a price in his tender for the cutting of a drain? No; I do not see how he could anticipate such a thing when there was a large natural creek there.
19479. Was the work which was done by the Harbours and Rivers Branch at Rozelle Bay commenced at the time tenders were put in? I believe it had been commenced; but it had not interfered with the natural channel.
19480. These two contracts were the only ones over which you had any personal or direct supervision? Yes; they are the only ones I dealt with here. I am supervising the outfall contract at North Sydney at the present time.
19481. As far as you know, was there any defective work done upon either of these two contracts? No.
19482. As far as you know, was there any defective work done upon any contract carried out by the firm? Not as far as I know.
19483. Has it been your desire as one of the members of the firm always to carry out your contracts faithfully—as well as they could possibly be carried out? Yes. That can be easily proved by the Government officers. I might say this—that Mr. Davis and other officers of the Department, when I have given my word that certain things should be done to satisfy the Department, have regarded my word as being as good as if the thing had been in writing. They have said so to my face.
19484. Have not all the other members of the firm agreed with you in that mode of proceeding? Yes. We have never had any difficulty in that way. If it were necessary for a thing to be done, we have always agreed to do it, and have done it.
19485. As to young Mr. Hickson, do you wish to add anything to your former evidence upon that branch of the inquiry? I do not know what further I can say.
19486. That is to say, there was at no time any serious intention of making him a partner? No, never.
19487. While he was engaged by the firm in Adelaide, and also at Johnstone's Creek, he had to perform regular and proper duties? Yes.
19488. His position was not a sinecure? No.
19489. Have the Department, from your point of view, made any concessions whatever to your firm? None whatever. They have always fought their side, and we have fought ours. Sometimes we have won, and sometimes they have won; but they have made us no concessions—in fact, it has always been a case of dragging all we could out of them.
19490. Has Mr. Davis been particularly lenient to you? No, he has been rather the opposite. He has been the most severe of them.
19491. Is it the practice in South Australia to allow advances to contractors on material? Yes.
19492. Is that provided for in their conditions? Yes.
19493. Have you had experience in any of the other colonies—in Victoria for instance? Not in the carrying out of works.

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19494. You do not know whether it is the practice in that colony to make advances on material? No.  
19495. Do you know whether it has been the practice in this Colony? I might say, in regard to Victoria, where I have tendered—and I think I am right in saying so—that their conditions provide for an advance on material. I never got a contract there, and I cannot be positive on the point; but I think I am right in saying so.

19496. Do you know whether it is the practice of the Department here to make advances on material to other contractors? I have heard so; I do not know it of my own absolute knowledge.

19497. You have been told so by other contractors? Yes.

19498. You have read Mr. Christie's evidence and report as to the financial position of the firm of Carter, Gummow, & Co.? I have seen some of it. I think I have read it through pretty well.

19499. Are you satisfied from your own investigation that the firm has always been in a sound financial position? Absolutely. That statement of Mr. Christie's deals only with some of our liabilities. It does not seem to touch upon our assets at all. It is a statement only in part.

19500. What do you mean by that? He does not seem to have entered into the matter sufficiently to see what assets we had.

*Mr. Parkes:* There was no intention as far as I am aware of proving that you were an unstable firm. The evidence was adduced only to show the reason that Mr. Weedon's money was paid into the firm's account.

*Mr. Andrews:* The assumption was that the firm were wanting money, and it was pointed out that this particular £2,000 came in very conveniently.

*Mr. Parkes:* It was intended to show, of course, that at that particular period the money came in very conveniently.

19501. *Mr. Andrews.*] Then I will put the matter in this way—Was it necessary at the time this £2,000 was borrowed by Mr. Carter from Mr. Weedon that the firm should have the money? I do not quite understand your question.

19502. Mr. Parkes now says that the effect of Mr. Christie's report is that the money was very convenient to the firm at that time? Undoubtedly, at 6 per cent. It would be convenient to us to get more money on the same terms to-day or to-morrow; but it was not absolutely necessary. We had a good credit balance in Adelaide, and, speaking personally, I could have put in between £2,000 and £3,000 of my own money at that time, at a day's notice, if it were wanted. In fact, I might go further, and say that I could have put in £5,000 without any security whatever on my own account.

19503. Do you know whether any other members of the firm could have helped financially? I think Mr. Gillan could, from what I have seen of his statements. I see he had a thousand pounds. I do not know about Mr. Forrest or Mr. Carter. All I want to show, as regards this £2,000, is that it was useful to get it at 6 per cent.; but it is quite a mistake to say that it was absolutely necessary for the firm. Speaking personally, I could have provided it without any trouble, only I could do better than 6 per cent. with the money I had got out.

19504. As far as you know, the firm had no dealing with Mr. Weedon in the matter at all? None.

19505. It was a loan to Mr. Carter, and he subsequently paid it into the credit of the firm? Yes.

19506. Have you anything to say as to Mr. Christie's report, which appears upon page 433—I mean his memorandum No. 19, as to the financial position of Mr. Gillan and Mr. Forrest when they gave separate bonds in the penal sum of £6,000 each? In the first place, I had nothing to do with Mr. Gillan's or Mr. Forrest's signing those statutory declarations. I was away in Adelaide. As to Mr. Gillan's declaration, I informed him that his interest as partner of Carter, Gummow, & Co.—that is, in the surplus assets of the firm—was £3,100.

19507. Is there anything more you wish to say as to that? Of course, in the £3,100 there would be included his share in the house in the Illawarra Road. That is the only freehold property he owns in connection with the firm, that I know of.

19508. There were some other matters, I believe, in Mr. Christie's reports concerning which you wish to say something? Only this—that his reports to my mind are not final; they are only partial, and in some cases they may be said to be inaccurate. Take the case of his report upon page 383, paragraph (e), "The Department's estimate of quantities, taken from the schedule, is 12 square yards. Mr. Hickson's minute practically authorises payment only for that quantity, which would have equalled a cost of £600." Mr. Hickson's minute, from the way in which I read it, does not say any such thing. It provides for the payment of the quantities shown in the drawings. How Mr. Christie came to make that statement I do not know. Then again, on page 214, there is a memo. "re the delivery of cement on Messrs. Carter & Co's. and Messrs. Carter, Gummow, & Co's. contracts from 1st January, 1892, to 30th June, 1896." If you turn to page 587, you will find a list of cement "purchased and delivered at Contract 72 from the 1st September, 1891, to 23rd June, 1892." In this latter memo. you will see items of 967; 994, 184, and 9 casks, under dates in 1892. In comparing the two reports you will see that there must be a misstatement in one or the other, because these items 967, 994, 184, and 9, were not included in Mr. Christie's previous report.

19509. *Mr. Parkes.*] But the first memo. does not deal with Contract 72 at all, does it? It says "Memo. re the delivery of cement on Messrs. Carter & Co's. and Messrs. Carter, Gummow, & Co's. contracts, from 1st January, 1892, to 30th June, 1896."

19510. But if you read the memorandum you will see that it eliminates Contract 72. It deals only with the North Shore contracts, with the Marrickville contract, and with the Annandale and Leichhardt Contract? No doubt the intention is to eliminate Contract 72, but it does not say so. The heading of the memorandum implies that it deals with the delivery of cement on all the contracts between the dates named. I mention the matter to show that Mr. Christie's statements are only partial.

19511. But he completes the statement in his subsequent memorandum, does he not? I do not see where he says so.

19512. Does he not complete it by his memorandum with reference to the cement on Contract 72? That may be, but the first statement is only a partial statement.

19513. *Mr. Andrews.*] Are there any other inaccuracies or misstatements which you desire to point out in the reports of Mr. Christie? I have not noticed any others. I have not read his evidence through, but, in glancing at it, I saw these apparent inaccuracies.

19514. Do you know whether it is the practice of contractors to shift material from one job to another?  
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Yes; wherever it may be required. The idea is to always keep sufficient stock of material in hand upon a contract, so that the men may not think that they are working themselves out of a job.

19515. Will you explain what you mean? If they see that the work is likely to be stopped for three or four days they steady down and sometimes put difficulties in the way. At all events, they do not work in the same way in which they would work if they saw plenty of work in front of them. We always have that trouble to contend with upon our contracts.

19516. Has Dawson applied to you for employment since he finished the North Shore job? Yes; he applied to me for work down at Johnstone's Creek.

19517. *His Honor.*] He got work there, did he not? Yes. I spoke to the ganger, Bandeen, about the matter, and Dawson afterwards got employment. I might explain this with regard to Dawson coming to me personally: He boarded at a boarding-house at Potts' Hill where the partners of the firm used to get their luncheon. Dawson was always about the house in the luncheon hour, and, of course, from speaking to a man in that way, one would get to know him better than one would ordinarily do from seeing him upon contracts. I suppose that is how it is that Dawson came to me personally. He knew me personally, whereas I speak to very few of the men upon the contracts.

19518. Did you notice whether he was a skilled man at his work? He was a good man. He had to do shovelling into drays at Potts' Hill. He was a very good worker. Some of the men were on piecework there, and he always earned good wages. At that time he was a blue-ribbon man, and he was steady at his work.

19519. Have there been times when he was not steady, or when he dropped the blue ribbon? I have heard so. I have heard that he has dropped the blue ribbon, but I could not say positively. I always looked on him as a very good man myself. He worked for us in South Australia.

19520. What do you know about his finally leaving the firm;—I mean on the last occasion of your giving him any work? On the occasion to which I have referred, when I got him work through Bandeen. I do not know when he left, but I believe it was when Contract 118 was completed.

19521. You did not see him again after the occasion to which you have referred? Not to speak to.

19522. *Mr. Andrews.*] Would any information which you are likely to get in the office help you in making out your tenders? No; we could get nothing more than we could get from the contract drawings so far as that is concerned.

19523. Is it likely that any one officer of the Department could furnish you with details which would help you? I do not know of a single point upon which he could assist us. The whole of the information is given on the plans. The bores are the only information which you may say are foreign to the drawings, and they are specially put in.

19524. Is there any other point upon which you have any statement to make concerning which I have not asked you a question? I cannot think of anything else.

19525. Will you refer to Question 5033 in the evidence of Mr. Gilliver. He says that there was another instance in which Carter, Gummow, & Co. sent in a lump sum price, and that it was on a job in which Gilliver and Curtis were the second tenderers. He said he thought it was Contract 107? He must refer to the job running through Stanmore which Mr. McSweeney has. I do not know the number of it. We put in two prices as stated, one at schedule rates and the other a lump sum.

19526. Why did you do that? We were sore with the Department for altering the system of tendering from the old system that was in use upon Contract 69, and we thought we would show the Tender Board that if tenders were called for in a lump sum instead of on the new system they could get their work done a good deal more cheaply. We put in tenders in the two ways really to see whether the Board would not alter the system of tendering. The present system does not suit us at all.

19527. The lump sum tender was the lowest? Yes.

19528. And it was rejected by the Department as not being in accordance with their regulations? I do not know.

19529. At all events it was not accepted? No; as I say, we fought the Department. We did not work with them. We fought them all the time, and that was our object in putting in this tender. We wanted at that time to upset their system.

19530. The rejection of your lump sum tender would show that the Government were not inclined to give you any concession except under very special circumstances such as existed in the case of Contract 77? They did not give us the contract, and I presume that what you say is the case.

19531. *His Honor.*] As an engineer, you might be able to say something concerning a point referred to in Mr. W. A. Smith's report on the Monier culvert at Strathfield. He seems to say that the Bordenave or Sidero cement system had been known for forty years in France, and that it was practically identical with the Monier system. Have you gone into that question at all? I have read of the Sidero system.

19532. What is it? I could obtain you the particulars easily enough; but, speaking from memory, it is a system of using girders instead of iron bars. They depend more upon the iron than upon the cement mortar, the mortar being used merely as a stiffening body.

19533. Is it an analogous system to the Melan system? I do not know that system at all.

19534. It is a system of small iron girders, at short intervals of about 3 feet, passing through from the intrados to the extrados of the curve or arch, only slightly covered for protection above and below with cement mortar, the iron being in T sections? I have heard of the system. I have also read of the Sidero system. I should not like to express an opinion with regard to it; but I know that it differs from the Monier system.

19535. Radically? Yes.

19536. It is only analogous in the embedding of the iron at certain intervals in cement mortar or strong concrete? That is so.

19537. But it does not apparently study the peculiar principle of applying the tensional strength of the metal only where the tensional strains come in, does it? Of course it does take up the tensional strains. I believe it does act in that way.

19538. But only the tensional strains, without taking the metal into the compressive strains? I should not like to express too strong an opinion upon that point. I have read of the system, but I would rather not go into the details. I know that it differs a good deal from the Monier system.

19539. I suppose you would define the Monier system as one in which the metal is applied in a very distributed form—in such a way as to utilise merely its tensional strength, utilising in compression members

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members the compressive strength of the cement mortar, or concrete? Yes; and also that the iron, in view of the cross-rods being used, distributes the pressure from one rod to another; which is not the case in the other systems. There is a distribution of the strains, and an elasticity is in consequence given to the system.

19540. It also specially utilises the tremendous adhesion between the metal and the compo.? Undoubtedly.

19541. So as to distribute strains much more perfectly? Yes.

19542. And prevent cracking? Yes; it relieves the particular point of stress.

19543. At any point of stress the stress is distributed? Yes; it is a more elastic body. The better the pressure is distributed over it the less strain there is at the point of contact.

19544. And there is no doubt, in relation to Mr. Dean's evidence, that if you were to build on the Monier system a plate without any curve and to use the metal near the soffit of the material, and if there were expansion of the material—that is, the cement mortar, or the concrete—the effect would be to do exactly what Mr. Dean says occurred in his opinion owing to contraction, that is, by curving the whole body upwards, to draw the ends away from the supports. It would put a camber on. The metal would not expand, whereas the cement mortar would expand? They expand and contract together.

19545. But I mean expansion in setting. If you had expansion in setting that would be the effect, would it not? I have never seen any expansion in the work.

19546. You say that it does not occur? Our experience is that it does not occur.

19547. Mr. Dean says that the drawing away from the girders or supports was due, in his opinion, to contraction after setting or to contraction in setting—contraction in the final setting? Our experience is that the work does not show any contraction.

19548. You say that the body is always absolutely the same throughout after the first setting? We have had experience of the work from January until now, and I believe there is no sign of any contraction in the arches.

19549. But there is expansion, is there not, in the setting of the cement—for instance, plaster of Paris expands considerably in setting. Do not some of the cements do the same? We have not any way of proving that they do. We cannot see the expansion practically.

19550. If the cement contains a little anhydrous lime it will expand in setting? I have seen, in making tests, a little blistering or cambering.

19551. That would be from unequal expansion, not from contraction? Yes. I have never seen it practically in the carrying out of work. All our cements are tested. They would not be passed if they did expand.

19552. Once cement bodies have set, then, the only contraction and expansion would be due to changes of temperature? Certainly.

19553. Which is a small variation, the same as would take place in iron? Yes.

19554. It differs so slightly that the elasticity of the body would compensate for the difference? Yes.

19555. You have never seen any actual change in size in setting? No; I have noticed in boxes sometimes that there has been a slight contraction away from the woodwork when the cement has set; but whether it is due to the wood's contracting away from the concrete or not I could not say. I could not say whether it would be due to that, or whether to the cement.

19556. You have not measured for that? No; but I have noticed a slight division between the woodwork and the concrete.

19557. At any rate you can say that the Sidero cement system, although analagous to the Monier system, differs from it in its main principle? Yes.

19558. It could not be called an anticipation of the same system? No.

19559. *Mr. Andrews.*] The arches at Johnstone's and White's Creeks are at present perfect as far as you can see? Yes.

19560. If any witness has said that they are falling down he is making a mistake? Yes.

19561. *His Honor.*] As to the test arches you made at Johnstone's Creek, they are there now? Yes.

19562. They were made with Nepean sand, were they not? No, with North Shore sand.

19563. With hand-crushed sand? Yes.

19564. You are sure of that? Yes; the sand came from North Shore. We took some of the mortar used in the construction of these arches and put it into boxes and made cubes of it. These cubes were brought to the Department so that we might see how the tests would come out. In one arch we used "Hemoor" cement, and in the other "Condor." We wanted to see whether there was any difference between the theory and practice. The Department made tests of the cubes.

19565. In both instances North Shore sand was used? Yes, with different cements. The "Condor" cement was a brand which we did not know so much about as we did of the "Hemoor," and we wanted to be quite sure of it.

19566. I understand you to say that North Shore sand is the sand which you have been using throughout in these arches? Yes, and also in the carrier.

19567. *Mr. Andrews.*] In all the work which has to do with the Monier system? Yes. We got a little Balmain sand over to test it, but it did not go so high in the Government test as did the North Shore sand.

19568. *His Honor.*] You did not use it at all? A little was used in the piers to see how it would go. It is a good, white, quartz sand.

19569. Is it broken sandstone? Yes. We made half-a-dozen tests of different sands. From the North Shore we got the white crushed sand and the yellow crushed sand. We did not like the look of the yellow sand as well as we did that of the white; so we tested it. We found that there was practically little difference in the two tests. Then we tried the Balmain sand—yellow and white. We also tried some white sand from Annandale, and we tried sand from the crusher. They were all tested with cement from the same cask. We found that the North Shore white sand was the best, and that the North Shore yellow sand was very close to it. I think the sand from the crusher came third, and that the Annandale sand was the poorest. We did not look round any further. We simply took the North Shore sand.

19570. You thought you could not do better? Yes, previous to that we made a test with Nepean sand. I will not say that it was the best Nepean sand; but it turned out that the crushed sand was a good deal stronger. We did not take selected samples. We merely took samples from the heap delivered

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to us. We did this for our own information and not to pass any test for the Department or anyone else.

19571. Had you heard of the merits of the North Shore sand in other work, or how did you come across it? Mr. Carter could answer that question better than I could. He got the sand before I came back to Sydney.

19572. *Mr. Carter.*] You know, as a matter of fact, that we are always hunting about for sand—making experiments with it, and so on? Yes.

19573. And that we got the North Shore sand in that way? Presumably. We always endeavoured to get the best material. We do not consider the price so much when we are getting a good article, and we will not be put upon by any persons who try to form rings against us.

19574. *Mr. Davis.*] Speaking of the Monier arches, it is a fact, is it not, that it would be very exceptional for the tension of the arches to be brought into play at all? Very, with the load that is there.

19575. What would you say would be the advantage of the Monier system, taking the aqueducts at Johnstone's Creek and White's Creek as an example? The advantage of putting the iron in the arch is not that you anticipate putting the iron under tension, but you must allow for a certain factor of safety in your work. You want to make your arch as elastic as possible, to resist any changes in temperature.

19576. Is it not a decided advantage to have an arch as elastic as a Monier arch would be, and is it not a special advantage which you claim for these arches at Johnstone's Creek? Undoubtedly. The material in these arches is of an improving nature rather than of a deteriorating nature. It varies from stone-work in that it is really strengthening day by day up to a certain period—that is, as far as we know.

19577. What I want you to speak to is this: Supposing you took a concrete arch, with concrete spandrels and a concrete carrier, you would have, to all intents and purposes, a monolith; and, if at any time expansion took place, there must of necessity, unless provision were made in the way of an expansion joint, be a crack occurring;—in the case of the Monier system would not the elasticity provide for a contingency of that kind? Yes; a solid concrete mass such as you speak of must necessarily act similarly to cast-iron. When it is cooling you will find that the thin part often contracts or cools more quickly than does the thick part, and, through that, a fracture occurs. That I consider is the weak point in making a body very thick in some places and very thin in others. These arches being almost of the same thickness throughout, and having the iron in them, form an elastic body which will give and take with the changes of temperature or with the load.

19578. You have there all the advantages of an elastic arch, with this addition—that you have a material specially favourable for compression? Yes; undoubtedly.

19579. And at the same time you have an enduring material which will continue to improve with age? Yes.

19580. You have spoken of the new system of tendering;—you said that, speaking for your firm, you were not particularly favourable to it? We are the very opposite; we are decidedly against it.

19581. You have had a good bit of experience in tendering, have you not? Yes.

19582. Have you ever come across this system before? I remember seeing it in connection with the water-pipes of the city and suburbs, under Mr. Trevor Jones, a good while back.

19583. You mean the water supply under the Water and Sewerage Board? Yes; that is the only instance in which I have seen it.

19584. In the course of your evidence, I think you have said that a contractor having special experience in connection with any particular kind of work would have an advantage in preparing his tender over a man who had had no experience in that work? Certainly.

19585. What would you say would be the effect of this new system, bearing that in mind, and taking your own firm as a firm which has had special experience in tendering for sewerage work—would you compare favourably or otherwise with an inexperienced firm under the new system? I think we compare unfavourably with an inexperienced firm.

19586. And under the old system you consider that you had an advantage over an inexperienced man? Certainly.

19587. Would you have very much, if any, advantage over an inexperienced man under the new system;—will you tell His Honor what has been the effect of the new system upon your firm—whether you have not been affected more than has any other firm of contractors by the adoption of the new system? We consider that we have been the cause of the alteration. It may have been conceit on our part, but we considered that it was a blow at us particularly. No doubt our firm have taken every advantage of the old system of tendering, and we were able to do so from the experience we had of sewerage work. I might say that I have been doing sewerage work since 1883. I was engaged then upon the Bondi sewer. Mr. Snodgrass was upon an adjoining contract at the same time. There was no one in New South Wales who had such experience of the work as we had. We often at that time, as engineers, compared notes on the schedules, and when we took to contracting ourselves we studied the schedules very particularly. We always took out all our own quantities, and then compared them with the Government quantities, studying the likely points of increase or decrease. We then arranged our schedule in such a way that if there were any alteration at all—any deviation from the probable quantities—we should make by it, and if the probable quantities were adhered to we should not lose at all. There are so many items in the schedule which depend for their use one upon one another.

19588. An inexperienced man would not be able to do that, and to that extent he would be at a disadvantage? Unless he had experience he would not be able to take the chance of putting a big profit upon one item and perhaps cost price upon the next.

19589. *His Honor.*] Gambling with the items, as it were? It is not altogether gambling; it is speculating.

19590. *Mr. Davis.*] The more the firm contracted the more experience it gained in this direction? Yes; the advantage we should have over a man who does not take out quantities is that we could really see what percentage we could take off or put on to each item, and then average it. If you do not take out quantities, that is not the case, and in tendering you would not know what you were doing.

19591. Supposing that in the new system the rates are so fixed that they correctly give the value of the work with a percentage for profit, it is a mere matter of arranging what profit you require and putting in your tender accordingly? That is so.

19592. *His Honor.*] If the engineer is right in his estimate the whole thing comes out satisfactorily to everyone;

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everyone; but if he is rather high on one item and rather low in another in comparison with the actual cost, the thing does not work well for anybody? You have to take out the quantities very carefully and study what quantities are likely to be used.

19593. It is an equation with a lot of unknown quantities? Yes; but your experience assists you to judge quantities fairly. I remember that in the case of the contract at Willoughby Bay there was one item which we considered was high priced, and that if we made any profits at all it would be on this particular item. On some of the other items we should lose, because we took 30 per cent. off the original schedule. A man who did not go into the quantities could not judge that from looking at the prices merely as set down.

19594. *Mr. Davis.*] In the case of the tunnel contracts there is in every contract plenty of room for difference of opinion? Undoubtedly.

19595. That is shown by the fact that we get tenders varying from sometimes (say) 0 to 25 per cent. below? Yes, they vary considerably.

19596. Coming to Contract 77, did you assist in the preparation of the tender? Yes; Mr. Snodgrass really prepared it. I went through it and approved of the items or altered them as the case might be.

19597. What was the price you put down as the prime cost for the Monier structure? The Monier mortar I put down at 70s.

19598. Can you tell His Honor what you estimated would be the prime cost of the work when you put in your tender for £15,500? The cost was about £14,700 as nearly as I can remember.

19599. *His Honor.*] The cost to you? Yes, including plant and supervision.

19600. *Mr. Davis.*] So that you put on a profit of about £750? Yes, from that to £800.

19601. Now that you have carried out the work are you confirmed in the opinion you had when you put in your tender, or otherwise? The work is not completed yet, and it is difficult to say what the general contract will make, because the two contracts, 77 and 118, have been worked pretty much together. We have had the same supervision for the two contracts, and the same yard expenses.

19602. But taking the price of the Monier structure per cubic yard, are you confirmed in your opinion? The Monier structure itself is a little cheaper than I anticipated. I had already put in my estimate for that part of the work. It is a little cheaper than 70s., excluding the iron work.

19603. Do you know enough of the affairs of Mr. Gillan and Mr. Forrest to say whether the declaration they made at the time Contract 77 was let to your firm was correct? No; I only speak with regard to their affairs in the firm. I do not know anything outside of that. I might further mention this—that I was under the impression at that time that the house at Dulwich Hill was Mr. Gillan's property. We had always looked upon it as his property.

19604. Apart from the fact of Mr. Gillan's not having any freehold property, as turns out to be the case, he has an interest, I believe, in the Illawarra Road property. Do you think he was correct in saying that he was worth £6,000? Yes; from what I know of his affairs. I have looked through his statement. As to the £1,000 deposit, we borrowed £400 off him and I believe he has the rest of it. I gave him the information as to his interest in the firm being worth £3,100. He has a further sum of £1,000 in the firm in addition to his interest of £3,100, and I might mention how that arose. Mr. Gillan was my partner originally. I did not consider that he was as advantageous to the firm as I was, and I thought he ought to put in a little more money, and he therefore put in the £1,000 actually on my behalf. I did not put in that amount but he put it in for me.

19605. *Mr. Parkes.*] Then it absolutely belongs to you? No; he holds a promissory note for it from the firm.

19606. But he bought an interest, as it were, in your superior value? He bought it, but I do not know whether he has much security.

19607. *Mr. Davis.*] The firm gets the use of the £1,000? Yes. It is Mr. Gillan's property. He has put it into the firm on my behalf, but he holds a promissory note for it.

19608. The firm gets the use of the £1,000 of Mr. Gillan, and he gets the use of your brains? Yes.

19609. *His Honor.*] When he goes out Mr. Gillan will take the £1,000 away with him, I suppose? Yes.

19610. In estimating the value of Mr. Gillan's interest in the firm, you do not include that £1,000? No. It is really a debt owing by the firm to him, but my share in the firm, instead of being £3,100, as Mr. Gillan's is, will be only £2,100, because I have not put in the extra £1,000 of capital.

19611. Which you would have put in if you had not got Mr. Gillan to put it in? Yes. I might mention that when I was a partner of Mr. Gillan, Mr. Maddison, and Mr. Ewing, I never put a penny into the firm. I put in only brains. They found the capital, and before any profits were distributed they got their capital back. We had a deed of partnership, which would show that they had to put in all the money necessary, and receive it back before profits were distributed.

19612. It was a loan without interest, as it were? Yes. They had in the firm their £2,000 or £3,000, and that, at so much interest, made up for the difference in value of their supervision as compared with mine. We all drew the same salary. I suppose they liked to get some salary, for fear there would be no profits. As against that, they had to put in the capital.

19613. *Mr. Davis.*] Did Mr. Hickson or I ever have any financial dealings with you or with any member of your firm? Certainly not with me; nor, as far as I know, with any member of the firm.

19614. Did we ever go into any "specs" together? No. There have never been any transactions between us except in our relations as Government officers and contractors.

19615. *Mr. Parkes.*] Tenders have already been called by the department for a section of the Balmain sewer running beyond Mr. Gilliver's contract, have they not? Yes.

19616. You tendered for that work? Yes.

19617. You were the lowest tenderers? Yes.

19618. Is not the specification entirely altered? I think not.

19619. Are there not only two classes of excavation? If you hand me the schedule I could tell you.

19620. Only two classes of material are mentioned—is not that so? I cannot say without seeing the schedule.

19621. Did you not make up the tender? Yes.

19622. Then you must recollect what is in the schedule? I prefer to see the schedule itself.

19623. Were not more numerous bores taken—were they not taken right through the strata to the bottom of the sewer? They are not more numerous than usual, I think. In some parts none are shown at all.

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19624. But they go right to the bottom, do they not. There are complete borings? The borings are about the same as I have usually seen in sewer contracts. In places they are below the invert of the sewer, but that would be in soft ground. It is usual to go through soft ground until rock is struck, or until they get to the invert of the work. In some cases the bores may be a couple of feet below the invert. In those cases probably the man who was boring would not know the exact depth of the invert.
19625. *His Honor.*] He would mean, I suppose, to stop at the invert? Yes.
19626. *Mr. Parkes.*] As to Mr. Christie's report *re* the delivery of cement—as a matter of fact the report upon page 294 deals only with the three contracts, 79, 79A, and 69? I believe so, from reading the bottom portion of the report.
19627. It was not complete, and that fact is shown on the face of the report, is it not? The report to which I referred just now would lead one to suppose, at a first glance, that it dealt with the delivery of cement upon the whole of the contracts.
19628. But the report to which I have referred you applies to only the three contracts I have named? I presume that that was intended, but I do not think it is so stated.
19629. Further research would bring forth the report as to the cement delivered upon Contract 72? Undoubtedly. But, reading the first report as it stands, without reference to the second report, I should take it that the whole of the delivery amounted to 21,572 casks.
19630. You will remember that we objected to putting in the total because our researches were not complete? Mr. Christie did not make that statement to my knowledge.
19631. But that was the object apparently of deferring the complete report? I do not know.
19632. Was there any cement delivered on to your job other than that disclosed in these purchases? Taking Carter & Co.'s bank-book, I should say yes.
19633. Did you purchase from any persons other than those whose names have been disclosed? I do not think so; but, looking at the bank pass-books, I should say that a good deal more cement has been purchased from Henry Austin than is stated.
19634. But if Mr. Austin has submitted returns from his ledger they would not be incorrect, would they? I do not say that the return is incorrect as far as it goes. My contention is that Mr. Christie's report is only a partial report, and that Carter & Co. have paid to Henry Austin for more cement than is shown there. I think that is disclosed by the bank pass-books.
19635. Were they cash transactions? They were paid by cheque.
19636. Did you never pay the firm in bills? Yes.
19637. And those bills would become due six months after the purchase? I could not say the date, but I am satisfied, from going through the bank-books and from speaking to Mr. Carter, that a great quantity of the cement charged in 1892 was delivered in 1892.
19638. But suppose the bank pass-books have been looked at, and that proper accounts have been made out; that the payments to Henry Austin & Co. are shown to be by P.N., the P.Ns. being at six months' date—that would be for cement bought some time previously, would it not;—for instance, there are a series of P.Ns. totalling £3,850;—that would be for cement bought previous to 1892? It could be so. I do not know whether it is so or not. I think you will find that some cheques were paid a good deal later.
19639. *His Honor.*] I understood that the list of purchases was taken to be correct? As far as it goes.
19640. I mean that it was taken to be an exhaustive list of purchases within the time to which it applies? My contention is that there was a further quantity of cement bought during that time..
19641. I understand you to be referring to Contract 72. But upon Contract 72 there were, I understand, large transfers of cement to Contract 79? I know nothing of that matter. I had nothing to do with that contract.
19642. *Mr. Parkes* ] The accounts of Henry Austin & Co. disclose the fact that there were various large amounts paid by P.N.;—that would be for forward delivery of cement? Yes, but I think there were other deliveries besides those. I know what the P.Ns. are, and from those we can tell that a great deal of cement was delivered in 1892 that was paid for in 1892. For instance, I see that on August 11th 409 casks were delivered at Waverley,
19643. *Mr. Davis.*] What you complain of is that the cement said to have been delivered upon these three contracts is represented as being the whole of the cement purchased? Yes; and there is a later statement which appears upon page 587, from which it would appear that there were three more invoices applying to 1892.
19644. Those not being included in the first statement? Quite so.
19645. *Mr. Andrews.*] Your complaint is that the first statement is misleading? Yes; one of the statements must be wrong.
19646. *Mr. Parkes.*] Do you recollect anything about the delivery of cement on Contract 72? I know nothing about that.
19647. Were you not upon 72? No; I was not connected with 72 in any way.
19648. On May 21st, 1892, a certain amount of cement was delivered to Gummow & Gillan by Henry Austin & Co.;—that was paid for by Carter, Gummow, & Co.'s cheque, was it not? No.
19649. On April 30th, 1892, 619 casks were sent to Gummow & Gillan, and were paid for out of Carter & Co.'s account? Yes.
19650. Were Carter & Co. and Gummow, Gillan, & Co. working together then? No; there was no connection. They were separate firms.
19651. Then why should that cement be paid for by Carter & Co.? I believe that Carter & Co. had a contract with Henry Austin & Co., and transferred this amount to Gummow and Gillan, Henry Austin & Co. holding Carter & Co. liable for the amount.
19652. Did you pay Carter & Co.? I hope so.
19653. Do you recollect doing so? I see there is a payment to Carter & Co. of £321 17s. 3d. under date of 3rd June. There had been a transfer in April of 619 casks to Gummow and Gillan. We appear to have paid Carter & Co. on 3rd June. Again, on 22nd August, there was a payment to Carter & Co. of £200 11s. 6d.
19654. Were you trading together after May, 1892? In about August, 1892.
19655. As to the letting of Contract 77, you were sent for specially to come across to make up the tender? Yes.

19656.

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19656. When you came across, did you consult any officer of the department as to the prices? No.  
 19657. Had you any communication at all with Mr. Hickson? No.  
 19658. You never asked him whether you could put in the Monier tender or not? No.  
 19659. You never had any words with him in any way on that subject? No.  
 19660. Nor with any officer of the department apart from Mr. Baltzer? No.  
 19661. What did Mr. Carter say to you when you came across, and when he asked you to make up the tenders? I do not recollect what he said particularly. I remember going across to the North Shore office, and Mr. Snodgrass had there the plan and also his estimate. They asked me to look through it and see what I thought of it. That is what it amounted to. I went through the estimate and criticised it.  
 19662. Do you know where the estimate is now? Yes.  
 19663. Have you the original one? Yes.  
 19664. Can you produce it? Yes. It is rather a ragged looking document, but it is the one which was made up at the time.  
 19665. In whose handwriting is it? A boy named Norman Burkett copied it for Mr. Snodgrass. It is the estimate which Mr. Snodgrass made out.  
 19666. *Mr. Parkes.*] The total, I see, is £14,677 10s.? Yes. There is an error of £100 in the addition. It should be £14,777 10s.  
 19667. *His Honor.*] You say you went through the estimate;—to what conclusion did you arrive? We differed on some points. For instance, in the quantities attached to the first two items. You will see that Mr. Snodgrass's quantity for the tunnel in lineal yards was 750. On the margin you will see that I have written in pencil 723. Then, in regard to item No. 2—shafts—Mr. Snodgrass estimated 100 lineal feet, and I had written in the margin 49. The entire estimate is as follows:—

## CONTRACT No. 77.—Estimate of Cost on Monier System.

|   |        |      |  | £     | s. | d. |                          |       |      |  | £       | s. | d. |
|---|--------|------|--|-------|----|----|--------------------------|-------|------|--|---------|----|----|
| Tunnel, lineal yards .....                        | 750    | 85/- |  | 3,187 | 10 | 0  | Gully covers .....       | 4     | 20/- |  | 4       | 0  | 0  |
| Shafts, lineal feet .....                         | 100    | 35/- |  | 175   | 0  | 0  | Blue pitchers .....      | 8     | 30/- |  | 12      | 0  | 0  |
| Monier, mortar .....                              | 1,070  | 70/- |  | 3,745 | 0  | 0  | Sandstone pitchers ..... | 320   | 6/-  |  | 96      | 0  | 0  |
| Sandstone concrete .....                          | 1,800  | 23/- |  | 2,070 | 0  | 0  | Two-rail fence .....     | 50    | 20/- |  | 50      | 0  | 0  |
| Iron, $\frac{3}{4}$ and $\frac{1}{2}$ , ton ..... | 44     | 10/- |  | 440   | 0  | 0  | Two-rail and wire .....  | 100   | 8/-  |  | 40      | 0  | 0  |
| Tie-bars .....                                    | 2      | 15/- |  | 30    | 0  | 0  | 24-in. pipes .....       | 120   | 30/- |  | 180     | 0  | 0  |
| Channel iron .....                                | 20     | 15/- |  | 300   | 0  | 0  | 12-in. " .....           | 20    | 6/-  |  | 6       | 0  | 0  |
| Cast-iron .....                                   | 12     | 10/- |  | 120   | 0  | 0  | 9-in. " .....            | 15    | 5/-  |  | 3       | 15 | 0  |
| Rendering .....                                   | 12,000 | 2/-  |  | 1,200 | 0  | 0  | Surplus .....            | 4,000 | -/6  |  | 100     | 0  | 0  |
| Piles .....                                       | 1,200  | 4/-  |  | 240   | 0  | 0  | Plant .....              |       |      |  | 488     | 5  | 0  |
| Open cut—soft .....                               | 4,000  | 1/9  |  | 350   | 0  | 0  | Management .....         |       |      |  | 750     | 0  | 0  |
| "    rock .....                                   | 1,200  | 4/-  |  | 240   | 0  | 0  | Smith .....              |       |      |  | 200     | 0  | 0  |
| Filling .....                                     | 2,000  | -/6  |  | 50    | 0  | 0  | Sundries .....           |       |      |  | 300     | 0  | 0  |
| Sandstone ballast .....                           | 700    | 3/-  |  | 105   | 0  | 0  |                          |       |      |  |         |    |    |
| Blue-metal .....                                  | 350    | 10/- |  | 175   | 0  | 0  | Total .....              |       |      |  | £14,677 | 10 | 0  |
| Screenings .....                                  | 180    | 2/6  |  | 22    | 10 | 0  | Price sent in .....      |       |      |  | £15,500 | 0  | 0  |
| Sandstone ashlar .....                            | 130    | 2/6  |  | 16    | 5  | 0  |                          |       |      |  |         |    |    |
| Kerbing and guttering .....                       | 650    | 2/6  |  | 81    | 5  | 0  |                          |       |      |  |         |    |    |

19668. *His Honor.*] I understand that you made your own calculations from the data upon which Mr. Snodgrass had been working? Yes.  
 19669. He is an engineer, I understand? I do not think he has been through any particular course, but he is a practical man, who has been with contractors for a long time. He has been through the drawing office, and he has had to go through a course of mathematics, but he has never passed any particular examination. He has been through a practical course of engineering with good engineers.  
 19670. Under good practical engineers? Yes. I believe he gained his experience principally upon railways in New Zealand, under a very large English firm—Brassey and Betts—who had work to do there. He went through the mill, you might say, including practical working in the office, and also outside. He can do instrument work, and everything of that kind. He is thoroughly capable. I do not think he could go into the higher mathematics, but that would be about the only thing he has not studied. He is capable as regards all general mathematical questions.  
 19671. *Mr. Parkes.*] I see that in Mr. Snodgrass's estimate sandstone concrete is put down at 23s. a yard—is that a fair value? I should say so.  
 19672. Shaft excavation is put down at 35s. a lineal foot? That is made up in a peculiar way. It includes the concrete as well.  
 19673. The tunnel, I see, is put down at 85s. per lineal yard;—would that include the brickwork? The brickwork and the concrete, but not the rendering.  
 19674. You have put down rendering at what? At 2s. a yard, the quantity being 12,000 yards.  
 19675. You have not your original estimate upon the departmental scheme for Contract 77? No; I have been looking for that, but I cannot find it.  
 19676. You have put down cast-iron at £10 a ton, and  $\frac{3}{4}$  and  $\frac{1}{2}$  in. iron-bars are also put down at £10 a ton? Yes.  
 19677. I suppose that was the market value at the time? Yes; I think you may take that as the fair market value.  
 19678. Had you any piling under the foundations of your piers? Yes; 1,300 odd feet. The Government specified 900, I believe. Mr. Snodgrass and I agreed in the main, though not in the details. Mr. Snodgrass's prices were a little too low, but then he had his quantities a little too high, so that the one balanced the other. Finally, when we made up our tender for the Monier design, we put it at £15,500, so as to be a little below our estimated cost of the Government design.  
 19679. You bought the timber for the job solely from Guy & Co.? Yes.  
 19680. If Guy & Co. shows for the two works, 77 and 118, a total of £568 5s. 2d., that would be the total amount paid? If that is what it shows.  
 19681. If Guy's accounts contain a great deal of timber which would be used for keeping back the earth on Contract 118, that would considerably reduce the total of £568? I do not think any timber was used on Contract 118 for keeping back earth.  
 19682. Did you ever see the work? Yes.

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19683. Was it not timbered back? No.
19684. Was not the earth timbered back while the excavation was being made? No; it stood all right without being timbered.
19685. Is it not specified to be timbered back? If necessary.
19686. *His Honor.*] Was the excavation taken out a good deal larger than the channel? We took it out about 9 inches wider than the outside of the concrete, but we did not get paid for that. If we found that by battering it a foot in 5 feet it would stand better, we would do it and save the timbering.
19687. It would be cheaper to take out the extra stuff than to timber? Yes. The excavation would be only from 2 feet to 4 feet.
19688. And not deep enough to be dangerous? No.
19689. *Mr. Parkes.*] You built cement sheds? Yes.
19690. And some of the timber would go into that work? Yes.
19691. You did not start the Monier arches in July, 1895; you did not start them until January, 1896? That is so.
19692. Then the timber delivered on July 10th, 16th, 17th, 18th, 25th, and up to the end of the month, and all the timber delivered in August and September—in fact up to the time the Monier arches were commenced—would be used for Contract 118, would it not;—am I not right in supposing that? No; you are wrong.
19693. Why? Because the centres were ready probably two months before we started building the arches. The carpenters were at work upon the centres some time beforehand getting everything prepared.
19694. In September, Guy & Co. charged for Oregon at the rate of 9s. per 100 feet superficial? That would not apply, I think, to the timber we used there. The 9s. would be for 1½ inch stuff. All the heavier timber would be charged at 11s. or 12s. The timber you refer to is light scantling. That would not be heavy timber.
19695. Will you point out the items to which you refer? Yes. You will find 5 x 2 at 11s., 3 x 1 at 11s., 4 x 2 at 11s., 4 x 3 at 11s., 12 x 1½ at 11s., 12 x 1 at 11s., 12 x 3 at 11s., 3 x 1 at 11s., and so on.
19696. I think if you go a little further on you will find that the rates are cheaper—that is, when you come to the end of 1895? December 13th, 6 x 4½ at 11s., 9 x 4½ at 11s., 10 x 1½ at 11s., 4 x 4 at 11s., then there are 12 x 5, 12 x 3, and 14 x 3, at 11s., and so on into 1896.
19697. *His Honor.*] Some of the small sizes are at 11s.;—were there two qualities? No; they charge different prices. It would depend upon whether we got trade-sized or special sized timber.
19698. The lower prices, I suppose, would be for the trade size? Yes.
19699. *Mr. Parkes.*] But the 1½-inch stuff would be the planking which you first of all used in the piers of the aqueduct? A lot of Oregon planking was used in the piers.
19700. And you afterwards took that Oregon timber and used it in the Monier structure? No; very little of it. If you had had our experience you would find that people in the neighbourhood would take a good deal of that.
19701. At all events, the total which you paid Guy & Co. for timber for both works was £586? Yes.
19702. And the material used for the piers you must have again used, as far as it was left, for the arches? Certainly; if any were left we should use it if it would come in.
19703. *His Honor.*] It would be none the worse for having been used in the piers, as a general rule? Not if you continue using it directly.
19704. The wood would also be very convenient for firewood, I suppose? Yes; that has been our experience over there. As to the centerings, there is a lot of labour to be put on to them, and there is also a lot of ironwork. That would have to be added on to the timber.
19705. *Mr. Parkes.*] Take the two Contracts—117 and 77; in the one case the excavations are 100 per cent. more than in the other schedule;—suppose the officers of the Department issue a schedule which is entirely in error, how would the contractor adjust it? By charging his percentage above or below.
19706. If there is an item 100 per cent. too high the contractor will take off something? He would take off what he considered would leave him a fair working price.
19707. And if he found an item too low he would add on a percentage? Yes.
19708. That is the way you make out your estimate? Yes.
19709. And then you make an average? Yes; on the total quantities.
19710. *His Honor.*] I suppose that in point of fact you make up your total first of all altogether independently of the Government prices? Yes; we take the plan and take off all measurements with sections, and calculate what we think the quantities and the prices will be. Then we add on our price for supervision, plant, and profit, and see what the total comes to.
19711. That would give you a primary basis for your percentage reduction? Yes; we take the quantities which we calculate will be used and multiply them by the departmental prices and see what the difference is in the two lump sums. In that way we get at the difference in the percentages.
19712. And you modify that afterwards on speculative grounds? Yes; in every contract there are different circumstances. There are a number of things to be considered.
19713. *Mr. Parkes.*] You are speaking now of the late system of tendering without quantities? Yes.
19714. But take the case where quantities are given? We take our own quantities and go by them.
19715. You do not accept the Government quantities? No.
19716. So that, after all, it is quite useless for the Government to provide the quantities? They may have been useful to other persons, but they are of no use to us. We should never use them.
19717. *His Honor.*] I suppose that in speculative tendering you assume that other persons may be guided by the Government quantities? Yes; we could see that they were. We could often find out that that was the case. Suppose a man got a contract. We find out six months afterwards that he had 50s. a yard for concrete. We see what sort of price we had, and we judge then whether he has gone on the basis of equal profit on every item. We always keep our eyes and ears open to see and hear all we can.
19718. *Mr. Parkes.*] As to the floodgates on Contract 118,—were you paid for those gates by the Department? No.
19719. You put them in at your own expense? Yes.
19720. As to the advance on plant that you have spoken of in South Australia,—had you advances made you on both plant and material? No; only on material.
19721. Not upon plant? No; but they gave us back the retention money whenever we applied for it, before the completion of the work, on three different occasions.
- 19722.

19722. *His Honor.*] At what times were those? The deposit was £5,000, and when the retention money came to a little over £5,000 we wrote in asking for the deposit. I saw the Engineer-in-Chief, and he said "Will the retention money suit you as well?" I said it would, and he then said "We will give you the £5,000 retention money." And we took it. F. M.  
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19723. *Mr. Parkes.*] Still he had the £5,000 deposit? Yes.
19724. Until the final completion? Yes; they have still got it. At the beginning of this year the Engineer was over here, and I told him that we wanted some more money. He said "Write in and we will see how much we can give you." Within a few days after we had written in they gave us £1,000 out of £1,800 standing as retention money.
19725. *His Honor.*] As further accumulated retention money? Yes; and in the following month they gave us another £1,000.
19726. So that they were content at any rate at intervals to bring themselves down to their deposit? Yes.
19727. *Mr. Parkes.*] You say you made up your estimates of the cost of the Monier work which you handed in the other day as the work proceeded? Yes.
19728. But, in your wages-book, you have the two contracts, 118 and 77, mixed up;—how, under those circumstances, could you arrive at your estimate? I made it upon what I observed on the works without any reference whatever to the time-book.
19729. You made no reference to the time-book? No, not further than this:—I would ask Mr. Forrest, who was with me, what he was paying the men for the particular work, the cost of which I desired to obtain.
19730. Did you make a special note of that? Yes; I made a note of it in a little penny time-table book, I think.
19731. You made special entries to find out the cost? Yes.
19732. At the time that the work was going on? Yes.
19733. Not day by day? No. It was whenever I thought fit to go on to the work to see what was going on.
19734. And that is how you made up your calculation? Yes.
19735. From information also which you obtained from Mr. Forrest? Yes.
19736. Nearly altogether from information which you obtained from Mr. Forrest? No. Perhaps I had better explain to you exactly what information I did obtain from Mr. Forrest. Supposing, for instance, I went on to the ground at 3 o'clock and saw that the men were making cover-plates, I would say, "How long have they been at it?" He would say, "They started at 2 o'clock." I would then stop there until they were finished, and from the information I obtained in that way I would estimate what the cover-plates had cost. So far as the arches were concerned, I was there during the whole time they were being turned.
19737. As to the cement you were buying at that time;—you were buying at 10s. a cask, and were paying 1d. a cask for delivery on the job? No; more than that for delivery on the job.
19738. Was it not 1d.? No. There was about three quarters of a mile lead, and I should say it would be from 3d. to 4d.; but I could not be sure of the cost.
19739. You were buying Try's cement for Contract 118, at the rate of 9s. 6d.? Yes. You must bear in mind, with reference to the cement generally, that it was equal to 10s. 3d. ordinary cost.
19740. But on the job? No; 10s. 3d. was the cost, less  $2\frac{1}{2}$  per cent. It was 10s. net.
19741. That is what you paid? We paid 10s. 3d., less  $2\frac{1}{2}$  per cent; that is the way you have to take it.
19742. The  $2\frac{1}{2}$  per cent. is taken off just the same? No. We had to take it to the shed, to stack it, and to bring it back again on to the works.
19743. What did Mr. Baltzer say to you when he presented the plans of the Monier work? I could not tell you. I do not think he presented it to me; I think Messrs. Carter and Snodgrass had it when I came to the office.
19744. A completed plan? As far as all the details are concerned.
19745. A finished plan? No; as far as I can remember it wanted some more printing. There were two or three little odds and ends to be done to it.
19746. Apart from the printing it was finished? It was finished as far as all the knowledge I wanted was concerned; but it was not complete so far as tendering was concerned.
19747. Were there two plans or one? There was only one plan of the design. Mr. Baltzer had a sheet of stresses and strains, to show that the thing had been properly gone into.
19748. Did he go into the quantities with you? No.
19749. Did he have a chat to you about the prices which were to go in;—did he go into the quantities? The quantities I got were those I obtained from Mr. Snodgrass. I checked them through to see what they would come to.
19750. Do you recollect when it was determined that he should not have a third share in the Monier patent, but that a percentage of  $2\frac{1}{2}$  per cent. should be allowed to him? Yes.
19751. When did that change take place? Early this year.
19752. Before the Annandale work was started? No.
19753. After that? Yes; early this year.
19754. After he left the office? Certainly—five or six months afterwards. The arrangement was made through Billyard, Andrews, and Moseley.
19755. A deed was drawn up with reference to his interest in the partnership? Yes.
19756. You thought that there was a good profit in this patent? I hoped so; I do not know yet.
19757. You took an interest in it,—it was not a thing you did not care a rap about? No; I took a great interest in it. More than half my time during the latter half of last year was given to the subject; we wished to make sure of it. The other partners left it to me to judge whether it was worth while to spend money over it, and I think my advice was taken on the subject.
19758. I suppose you had a good number of interviews with Mr. Baltzer during that time? Yes.
19759. Was he as interested in the matter as you were? More so.
19760. He was very anxious to make a profit out of it? No; I do not think so. He is an enthusiast in any matter of that kind. He has other ideas in hand. He is always speaking to me about various German patents.
19761. But he is anxious to make money out of these patents? Certainly.



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Gummow.  
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19762. He is not merely idling his time away? No; we were paying him in the meantime.
19763. He looked for a fair profit until this change took place, under which he received only  $2\frac{1}{2}$  per cent.? I could not say what his idea was before that, and I do not know whether it was considered at all.
19764. *His Honor.*] What was the reason for the change? It is a very difficult matter for us to keep a separate account of the profit arising out of any particular use to which this system is put. Suppose it is used for floors in a building. The probability is that we should send a plant from our works. We had the plant in hand, and we could not charge it partially to a third or fifth party. It is very difficult to keep such an account separate, and, as it might lead to disputes, we agreed with Mr. Baltzer to give him  $2\frac{1}{2}$  per cent., so that as regards every bit of work of the kind which we got he would be sure of that amount.
19765. You agreed to give him  $2\frac{1}{2}$  per cent. upon all those portions of your work involving the Monier system? Yes. We found that it would save us a great deal of trouble in the keeping of accounts, and Mr. Baltzer would get a definite amount whether the job paid or not. Supposing we were going to erect a building in which there was £500 worth of Monier flooring, Mr. Baltzer would get  $2\frac{1}{2}$  per cent. on that £500.
19766. He would not get a percentage on the whole cost of the building? No; only on the cost of that particular construction.
19767. So that you still have to take out the particular construction, but not with such an elaborate calculation as you would otherwise have had to make? We take out the cost of the particular construction. When we are estimating for the work Mr. Baltzer is there to see what is done. He knows, for instance, that the Monier work will run into a thousand pounds. Therefore he knows at once what he is going to get upon it. We should not have to keep an account of that particular construction apart from the general construction. That was the reason for the change.
19768. *Mr. Parkes.*] When Mr. Baltzer went away to England was it understood that he was to get further particulars with reference to the Monier system? His idea for some time had been to go home.
19769. He himself wished to go? Yes; we had spent a good deal of money in tests, and Mr. Carter and I considered that it would be cheaper in the long run to send Mr. Baltzer to Europe to get all the particulars. We thought that would be a great deal better than the expenditure of a considerable sum of money in finding out the different points for ourselves.
19770. And you paid him a certain sum of money to go home? We told him to go home, as the people in Europe, in writing to us, did not know what was wanted in Australia. We thought that on the whole it was better for him to go home, and we gave him £200 for his expenses.
19771. The rest of the money was for finding out the information? Yes. For instance, he was to go to the Berlin Exhibition and to desiccating works, and he was to pick up all the information on that and other subjects which he could in Germany.
19772. You gave him a cheque for £508? Yes; the £8 was the exchange.
19773. Did you not send in a model of the Monier arch to the department? No.
19774. Have they not a model? Yes; I believe so.
19775. Has not their model cracked? I could not tell you.
19776. Have you not seen it yourself lately? I have seen it there for about two years.
19777. Has it not cracked from contraction? I do not think so, if it has cracked at all. It is on the floor up near the Under Secretary's. If it has cracked, it has been probably due to carrying the thing about on the pedestals. It has been there, to my knowledge, a couple of years, but I have nothing to do with it, personally or otherwise.
19778. *His Honor.*] You paid for the flood-gates for the drain on Contract 118? Yes.
19779. Did you contend that you were not bound even to do that? Mr. Hickson was over at the works, and he said "I think you should put up the flood-gates for your own benefit when the tide comes up."
19780. What is the object of the flood-gates? They are to keep the tide back. We did not object to provide them to prevent the tide from coming on to our work. We were working below high tide.
19781. So that in dry weather they would be an advantage to you? Yes.
19782. If you had been working in the original channel of the creek you would have put a flood-gate there? Yes.
19783. Having that defined channel cut, it became convenient to put up the flood-gates to prevent the tide from interfering with your work? Yes.
19784. *Mr. Davis.*] As to your lump sum tender for Contract 107, do you remember the precise circumstances under which that tender was put in? All that I can think of is that we put in a lump sum tender to show that our lump sum was lower than the sum worked out at schedule rates less the percentage.
19785. Do you remember that a large proportion of the sewer shown on the contract drawings was eliminated before tenders were invited, but that the schedule contained the quantities for the portion which was eliminated? Yes; I believe there was something of that kind.
19786. And you, taking advantage of that, put in a lump sum for the work left? Yes; I believe that was the case now you mention it. The idea, as I said before, was to crush out the percentage system if we could.
19787. Your lump sum was for the balance of the work left in the contract, but not for the work contained in the schedule? Our lump sum was made out in quantities which we took off the plans without reference to the Government quantities.
19788. On the work contained in the contract drawings after the portion to which I have referred had been cut out? It was on the work shown on the contract drawings re-advertised.
19789. That would show the difference between the schedule rate at which you tendered and the lump sum? I could not tell you what was cut out. I remember that there was some portion cut out now you mention it. We were satisfied to do the work for the lump sum.
19790. *Mr. Andrews.*] Your agreement with Mr. Baltzer was entered into a day or two before he left for Europe? Shortly before he left for Europe—I do not know exactly how long before.
19791. Was any timber taken to Johnstone's Creek other than that which you purchased from Guy & Co.? Yes.
19792. The £500 odd which we have heard about represented the new timber purchased for the job? Yes.
19793. The balance of the timber which you had used at North Shore and Marrickville was also taken to Johnstone's Creek? Yes.



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Gummow,  
28 Sept., 1896.

19794. *Mr. Parkes.*] Is timber of that description worth carrying about? We carried it about.
19795. *Mr. Andrews.*] You know your own business best. You know when it pays you better to buy new timber than to cart about the old timber? Of course.
19796. *Mr. Parkes.*] From what jobs could the old timber which was taken to Contract 77 have come? From Marrickville and North Shore.
19797. When was the Marrickville job completed? Not until about September of last year.
19798. What would the timber be used for in the case of the Marrickville job, apart from that left in the ground? There would be a lot of use for timber there. There were excavations, and timber would be put in to support the sides.
19799. You did not draw that out, did you? In the open cuttings we did, but not in the tunnel.
19800. Did you back up the open cuttings with timber in the case of No. 69? Yes. I had nothing to do with the contract, but I only know it from just going over there. The ground is clayey, shaly, ground, and you need toms from one side to the other and waling. There were a few lengths here and there where there was not close timbering.
19801. From what other job could the timber have gone? From 79 and 79A.
19802. What would you be using the timber for upon Contract 79? There would be a lot of Oregon in the poppet-heads and in the timbering round the shafts.
19803. Would you use that in centerings and things of that sort in the aqueducts? No; but it might be used for trestles, and there would be odd bits for cutting up. There are a lot of odds and ends requiring timber. It would be difficult to say at a moment's notice what it would be used for. If you were on the job you would soon see the uses to which it could be put. There was also some timber which we had stored in Fowler's yard, at Camperdown, which was used on the job.
19804. *Mr. Andrews.*] You are sure that timber was removed from North Shore, from Marrickville, and from Fowler's yard to that contract? Yes.
19805. Is it not a common practice with contractors to sell material, and cement in particular, to other contractors? We have done so; I do not know whether it is the common practice or not.
19806. Other contractors have bought from you? Yes.
19807. So that the fact of Carter & Co.'s having paid for cement which was delivered to Gummow and Gillan does not prove that there was any partnership between the two firms at that time? As a matter of fact there was none. The circumstances you allude to go to show that Henry Austin & Co. intended to keep Carter & Co., and did keep them, to their contract, and that Gummow and Gillan were an offshoot with whom they had nothing to do.
19808. *Mr. Parkes.*] As to the profits which Mr. Maddison and Mr. Ewing drew, were they all drawn from Contract 69? No; in making up a balance-sheet I think 79A was taken into consideration. It was going on at that time, and they were shareholders in that.
19809. Were they not shareholders in Contract 79? No.
19810. Then the whole of the profit which they drew would come out of 69 and 79A? No; some would come from Adelaide.
19811. You were not paying profits on the Adelaide job at that time? So far as that goes, we were not paying profits on any contract, but we estimated the value of our assets over our liabilities, and we paid them their share.
19812. They drew out the large sum of £2,000 apiece? I think their share was about £3,000 each.
19813. That was fine profit for seven partners to come from the two contracts, 69 and 79A? If it were so; but £2,000 of the amount was original capital, which was returned to them.
19814. On what date did they put it in? In August, 1892.
19815. Did you all put in your capital at that time? I did not put anything in.
19816. You are referring now to the time at which the money was put into the firm by these two partners? Yes.
19817. Is the payment shown in the bank-books? Yes. There is an amount of £5,000 placed on fixed deposit.
19818. Was not that an overdraft? No.
19819. Was it not transferred to Adelaide? It was sent as a deposit receipt to Adelaide. Then on August 20th I see a sum of £1,000 was sent to Adelaide.
19820. The bank-book says: "Amount of credit established at Adelaide branch";—what did that consist of? That is the £5,000 deposit receipt, I presume. I imagine that the £5,000 was paid here, and that the bankers credited it to the Adelaide branch. The £5,000 deposit was drawn on that. It was not a £5,000 overdraft in Adelaide.
19821. *His Honor.*] Did the bank hold the deposit receipt? No; the Government held the deposit receipt, and the bank paid us the interest.
19822. *Mr. Parkes.*] During the time Mr. Maddison, Mr. Ewing, Mr. Snodgrass, Mr. Forrest, Mr. Carter, Mr. Gillan, and yourself, were carrying on business you all drew your salary of £43 a month regularly? While we were working.
19823. Does not that appear from the bank-books to have been drawn regularly? No.
19824. Is not the document I hand you a letter of credit upon Adelaide? Yes; it is the amount of the credit established at the Adelaide branch—£5,000.
19825. You arranged for an overdraft here, and had the credit placed to the Adelaide account? We paid the money here, and the bank, presumably, told their branch at Adelaide to give us credit for £5,000.
19826. Then what was the £5,000 drawn out of your bank for? That is against the £5,000 standing to our credit here. Instead of our taking the money over, the bank made the necessary entries.
1927. You sent £5,000 from here to Adelaide? That is apparently what was done.
19828. What would be the deposit put into the bank? I suppose you mean the fixed deposit of £5,000 in Adelaide.
19829. What made the deposit in the bank here? I presume it was put in by members of the firm. It would be shown by Gummow and Gillan and Carter & Co.'s bank-books. For instance, I see that in August 18th, 1892, Gummow and Gillan paid to Carter & Co. £1,000; on August 22nd they paid to Carter, Gummow, & Co. £2,500, and so on.
19830. Could you tell us exactly what Mr. Ewing and Mr. Maddison paid in? £2,000 each.

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19831. Where is it shown? Through Gummow & Gillan's account. You will see the following payments: £2,500 on August 22nd, £1,000 on August 18th, £500 on October 8th, £1,000 on March 23rd, 1893. That makes up the £5,000. You will see from another book of Gummow & Gillan's that on August 18th they paid £1,000. They had two bank-books at that time—accounts No. 1 and No. 2.  
19832. And you say that Mr. Maddison and Mr. Ewing each withdrew the sum of £2,000 capital? Yes.  
19833. *Mr. Andrews.*] At the time of your payment to Mr. Maddison and Mr. Ewing there was no ascertained profit on any of the jobs. The Murrickville job was not finished, 79A was not complete, and the Adelaide job was incomplete? Yes.  
19834. The amount you paid to them was an estimate of profit as against ascertained profit? Certainly.  
19835. When did Mr. Snodgrass leave the firm? In January of this year—about the middle of January. His balance was made up to the end of last year.  
19836. Practically he left on the 31st December last? Yes. But he received a salary up till the end of March or April,  
19837. Do you know where he is now? He was in New Zealand when I last heard of him.  
19838. Had he gone there to live permanently? Yes.  
19839. *His Honor.*] He could be found if required I suppose? Yes. His wife, I understand, is here. I think she is leaving for New Zealand in about a fortnight.

John Carter recalled and further examined:—

J. Carter.  
28 Sept., 1896.

19840. *Mr. Andrews.*] As one of the members of the firm of Carter & Co., and Carter, Gummow, & Co., has it always been your endeavour to carry out your contracts well and faithfully? Yes.  
19841. And have you exercised the utmost care upon all the contracts you had anything to do with? Yes, as far as my part of the work is concerned—that is, in the purchasing of good material, and in the payment of good wages, and so on.  
19842. And if the department have required you to make any alteration in the work you have been always willing to comply with their request? Yes. We have been always willing to meet them.  
19843. In any way whatever which was fair? Yes.  
19844. Until this Commission was commenced, had you ever heard any serious complaints of defective work upon any of your contracts? No.  
19845. *Mr. Parkes.*] You heard of the Waverley job? We never had any serious defective work there. I do not call a pothole of 3 feet a serious defect, and that is the only defective work I heard of as being found there.  
19846. *Mr. Andrews.*] The evidence of Mr. Bagge came to you quite as a surprise? Undoubtedly.

WEDNESDAY, 30 SEPTEMBER, 1896.

Robert Rowan Purdon Hickson recalled and further examined:—

R. R. P.  
Hickson.  
30 Sept., 1896.

19847. *Mr. Parkes.*] I desire to know whether you knew Mr. Snodgrass well? Not very well. I have seen him several times as a contractor.  
19848. Had you many interviews with him about business matters? Very few interviews, because Mr. Carter himself, or Mr. Gummow, if he happened to be here, nearly always came to me concerning matters of business.  
19849. As to Contract 77, did you before the tenders were sent in have any conversation with Mr. Snodgrass in connection with the substituted plan? None whatever. I did not know that they were going to send in a substituted plan at all; I did not see it until after the tenders were received.  
19850. You knew nothing about it up to that time? No; I had no idea they were going to send it in.  
19851. You did not have any interview upon the subject with Mr. Gummow or with Mr. Snodgrass? No.  
19852. In connection with Contract 79, did you see Mr. Snodgrass with reference to it before it was let—I mean the original 79 contract? I suppose I saw the contractors some time or other before it was let.  
19853. But did you have any conversation at all with Mr. Snodgrass about the firm's having got that contract? No; I would never do such a thing with any contractor.  
19854. You had no conversation at all with him on that subject? Certainly not.  
19855. Did you see Mr. Snodgrass or Mr. Gummow in connection with the matter either before or after the tenders were received for Contract 77? I am not sure. I do not think I saw Mr. Snodgrass. Of course I saw Mr. Carter as to the surety question.  
19856. Only with regard to the surety question? Yes.

FRIDAY, 2 OCTOBER, 1896.

Louis Blayney Mitchell sworn and examined:—

L. B.  
Mitchell.  
2 Oct., 1896.

19857. *His Honor.* What are you? I am a civil engineer and contractor.  
19858. Where have you been living? In Melbourne.  
19859. You have been exercising your profession in Melbourne? Yes, for the last two years.  
19860. Before that were you living in Sydney? Yes; I was employed on the Great Southern Line in New South Wales at one time.  
19861. Were you employed by the Department? No; I was employed by Mr. M'Sweeney, the railway contractor.  
19862. I understand that you have come here to give some evidence touching a matter to which attention was called in the newspapers the other day? Yes. I happened to pick up the *Sydney Morning Herald* yesterday morning. I had just come from Melbourne, and I thought that, as I happened to know something about Mr. Carter, I might be able to give you some assistance.  
19863. Will you kindly state what you know of your own knowledge? As far as I am personally concerned, I may state that I know Mr. Carter to be one of the most generous men I have ever met.  
19864. For how long have you known him? For the last four years.

19865.

19865. Can you tell me of any special instances, from your own knowledge, of his generosity and liberality? I know of one matter, which is connected with myself; it was a private matter between myself and another gentleman.

L. B.  
Mitchell.

2 Oct., 1896.

19866. Have you any objection to state the circumstances? I could state them privately to your Honor, but I do not wish the details to be published, as they affect a gentleman who was at one time in Sydney, and who cleared out and left things in the lurch.

19867. Leaving the name of that gentleman out of the question, could you mention the circumstances? They relate to a bill I had for £50; I wanted money to pay this bill; I was short of it, and I went to Mr. Carter; he gave me the money, and he has never troubled me for the money.

19868. How long ago was it that this thing happened? It was just before I went to Melbourne, about two years ago.

19869. You had then been acquainted with Mr. Carter for about two years? Yes.

19870. Had you been intimately acquainted with Mr. Carter, or only generally? I had met him in the tender room, and that sort of thing. I knew him to be a very friendly man.

19871. Had you had any business connection with him? No, not then.

19872. Not at the time he helped you in this way? No; it was after that that I had a business connection with him.

19873. Did he volunteer this assistance, or did you ask him? I asked him for the assistance, because I was at the time in some trouble.

19874. Had you to press him very much? Yes. I saw him three times about it. Finally he gave me the assistance because I was in a hole and could not get out of it. I wanted to leave Sydney and go to Melbourne on business. I could not get away with my family.

19875. Did Mr. Carter receive any benefit at the time from the transaction? No.

19876. He had merely the loss? Yes; the money has never been repaid him yet.

19877. What was your reason for going to Mr. Carter;—was it from anything you knew or had heard of him? I just knew him as a friend. I always found him a most generous man.

19878. Then he had that reputation? He always had that reputation, I think. Of course, I would not ask him to do a thing such as he did for me unless I was stuck in a corner.

19879. Mr. Carter has never since troubled you in the matter? No.

19880. *Mr. Parkes.*] Was this gentleman who you say let you in for £50 connected with Mr. Carter in business? In no way whatever.

19881. Did Mr. Carter know him? No; I do not think so, until I introduced him to Mr. Carter.

19882. He did meet him then? Yes.

19883. Was this money you lent to the gentlemen of whom you have spoken lent in the way of a business transaction? It was money which he had borrowed from me.

19884. How did Mr. Carter pay you? He gave me a cheque.

19885. What is the date of the cheque? I could not tell you. It happened two years ago. I think it was a cheque, but I am not absolutely sure.

19886. The amount was £50? Yes.

19887. *Mr. Gummow.*] As to this other gentleman of whom you have spoken; had Mr. Carter anything whatever to do with him? No.

19888. He had no business transactions with Mr. Carter. He was simply introduced to Mr. Carter by you? That is all.

Henry Charles Mitchell, sworn and examined:—

19889. *His Honor.*] What is your position? I am secretary to the Chamber of Commerce in Sydney.

19890. You know Mr. Carter? Yes.

19891. How long have you known him? About ten or eleven years.

19892. You have come here, I understand, in consequence of something you saw in the newspapers? Yes.

19893. Will you tell me what you yourself know of Mr. Carter in that relation? I know that he acted as a friend to a person who was almost a stranger to him—a person he had only known about two or three years, and whom he knew through my introduction. He advanced to this person moneys without any security—absolutely on good faith. By degrees the moneys so advanced amounted, in round figures, to £600. The gentleman to whom this money was advanced died, and his affairs were very much involved. Shortly before his death, however, he gave Mr. Carter a bill of sale over his household furniture and effects. Mr. Carter was subsequently spoken to, and was told that he had better take the furniture. He did so; but he held the furniture for the widow, whom he had never seen, and of whom he knew absolutely nothing. He settled the furniture upon her and her children. I do not think he ever saw the lady in his life. He had only known the gentleman, to whom he advanced the moneys, in the way of business; and the amount, as I say, came finally to £600, in round figures. It may have been £20 more or less.

H. C.  
Mitchell.

2 Oct., 1896.

19894. What should you say would be the value of the furniture? It cost, at least, about £800.

19895. Was it good furniture? Yes, A1 furniture.

19896. It might have sold for £200 or £300? If I had the money, I should be very glad to give £400 for it now. It included a piano, which, to my own knowledge, cost £100.

19897. That is one example of Mr. Carter's generosity;—do you know of any other special example? Of my own absolute knowledge, no. I have heard, however, of another matter. It is of rather a delicate nature. I would not object to telling your Honor privately.

19898. I will not ask you for the details, but had it something to do with some one who behaved in a dishonest way, or who got into trouble? No; it was the case of a gentleman who occupied a very high position, and who fell into distressed circumstances. Mr. Carter, having known him for some years, in the total absence of any claim upon him, contributed something to his support.

19899. Substantially? Yes, and regularly.

19900. There is no relationship of any kind between them? No.

19901. Can you mention any other matter? I know myself that whenever Mr. Carter has been asked for £1 he has generally given it. It has often happened in my own office. If he has there been asked to contribute to a deserving case he has almost invariably said "Yes."

19902. The money has come out of his pocket as a matter of course? Yes; he has done that on more than one occasion.

19903.

- H. C. Mitchell.  
2 Oct., 1896.
19903. Apart from your own knowledge, you know from general repute what is Mr. Carter's character for generosity? Yes. The first time I met him was in connection with a piece of land. He was surveying then. I had bought this piece of land, and I asked him whether he would survey it for me. Although I had only known him for a very little time, he said "All right, old man," and surveyed it. I have asked him dozens of times for the account, but he has never sent one in. That would be ten years ago. I had only just begun to speak to him, but had known him by sight for some time before.
19904. That circumstance, and the others of which you have told me, indicate the general repute in which Mr. Carter is held? Yes; I have heard a lot of people, long before this inquiry was thought of, say—perhaps it was not very complimentary to him—that he was a good-natured fool.
19905. *Mr. Gummow.*] Have you ever heard Mr. Carter speak of the question of keeping books? I have.
19906. When was it? It must be between four and five years ago.
19907. Will you tell His Honor what happened? There was some action going on in the law courts between two contractors. I think it was the Amoses. If I remember rightly it was a question of disputed accounts. The brothers had quarrelled, and incidentally I said to Mr. Carter "What books do you keep?" He said "None at all." I then said "You have two or three partners. Supposing a couple of you were in a drive and got killed, how would the other men behave to your widows?" He replied "I trust them and they trust me." I remarked "That is very foolish." He said "What is the use of book-keeping? We find that books are kept, and, when it comes to a crisis or a row, men will say that certain entries should never have been made, or that they were made without their knowledge and consent. It is all rubbish. I trust my partners and my partners trust me." He also told me that none of their transactions were very large, and that their bank-books showed each transaction. He said that if the firm had three contracts going they would keep three separate accounts; but that they kept no books whatever. I am able to fix the time of the conversation, because I know that it was before my partner was killed, and he has been dead for over three years.
19908. *Mr. Parkes.*] What are you in business? I am Secretary of the Chamber of Commerce, and a broker.
19909. You have acted as a broker for Mr. Carter for what number of years? I think since he had his second contract. It must be between six and seven years.
19910. You have bought all his cement and things of that sort? Yes.
19911. *Mr. Gummow.*] You are here, I suppose, to tell the truth irrespective of any business connection which you have had with the firm? Yes; I have nothing to gain by doing the other thing anyway.

Trenham Old sworn and examined:—

- T. Old.  
2 Oct., 1896.
19912. *His Honor.*] You are a civil engineer, living at North Shore? Yes.
19913. You know Mr. Carter? Yes; I have known him for over twenty-five years. I can only speak generally with reference to him—that is, as to his generosity. I cannot mention any names, but, in a general way, I have known him to do a great many charitable actions of a private nature in the way of relieving distress. Whenever there has been any local subscription, I have always mentioned Mr. Carter to those who have been going round with the list as a likely donor.
19914. Feeling pretty sure that the collector would not knock at his door for nothing? I have felt pretty sure that he would not. I do not say that Mr. Carter will give to anything. I do not suppose he would allow his generous impulses to run entirely away with his judgment.
19915. That, at all events, is the repute in which he is held? That is the repute in which I have held him, and I know that he is held in the same repute by many other residents of North Shore.
19916. He has a reputation for liberality? Yes.
19917. And good nature? Yes.
19918. Do you know of any instances of Mr. Carter's generosity? I know of several instances, but I could not mention the names.
19919. Quite apart from the names, can you mention any special instance of Mr. Carter's generosity? I have known him to assist several old school-fellows who have got rather down in the world. He has assisted them to get away. I have known him to do that in a couple of instances.
19920. Giving them substantial help? Yes; paying their fare to wherever they reckoned they could better themselves. I have also known him to help workmen who were suitable to the kind of work he had on his jobs, and who could not get work to do elsewhere, by putting them on to one of those jobs; or, if he could not do that, by trying to find employment for them.
19921. *Mr. Gummow.*] Have you anything to do with the subscriptions to the local hospital? No; but I believe the firm have always supported the local hospital well. I have heard so; but I myself am not connected with the institution.

John Alcock sworn and examined:—

- J. Alcock.  
2 Oct., 1896.
19922. *His Honor.*] What are you? At the present time I am carrying on a tanning business.
19923. Do you know Mr. Carter personally? Yes; I worked for him on the Brighton to Apsley line in Tasmania years ago. It was piece-work.
19924. Is that the only business transaction you have had with him? Yes. I came here to-day, however, in consequence of seeing a paragraph in the newspapers inviting anyone to come forward and say anything which they knew about Mr. Carter as a man likely to do another a good turn. That is the way in which I took it.
19925. What have you to say of Mr. Carter from that point of view? Well, he has paid me money on more occasions than one when it was not coming to me.
19926. For work you were doing? No; he gave it me freely. When I asked him for £5 he would give me £10.
19927. Was it an advance? There was no mention of it at the time. I did the work for him afterwards. I have asked him for money more than once, and when I have asked him for it he has generally handed me more than I have asked for.
19928. By way of an advance you mean? There was no mention of its being an advance; but I treated it as such. I do not think many men would give me money which was not coming to me. He handed me the money of his own free will.
- 19929.

19929. You took that as showing that Mr. Carter was very free with his money? Yes; when I saw the paragraph in the newspapers I thought that if I could do any good by mentioning the circumstance I would do so. I have only seen Mr. Carter once since the occasion to which I have referred, and I did not know that it was the same Mr. Carter for whom I had worked until I made inquiry. J. Alcock.  
2 Oct., 1896.

19930. At the time to which you referred, what reputation had he among the men for liberality or otherwise? He had a good reputation. All the men gave him a very good name.

Richard Adams sworn and examined:—

19931. *His Honor.*] What are you? I am a cab proprietor. I also have livery stables, &c. R. Adams.  
2 Oct., 1896.

19932. Do you know Mr. Carter? Yes.

19933. How long have you known him? For the last fifteen years, or a little more. I knew his father.

19934. You have come here in consequence of a notice which you saw in the newspapers? Yes.

19935. Will you tell me what you know in that connection? I have never had any business transactions with Mr. Carter, and I have never been employed by him; but I happen to know of a family at the Glebe whom Mr. Carter some years ago almost kept. The unfortunate man happened to lose his position after the maritime strike. He went to Mr. Carter on one occasion, on the death of one of his children—he lost three children altogether—and I know that Mr. Carter then gave him £5. Within two years he went to Mr. Carter and asked for employment. Mr. Carter could not give him employment, but he gave him a pound; in fact, from time to time he has assisted the whole family. I know he has almost supported the family. I know of other instances of a similar kind, over at the Shore. Mr. Carter has a most generous way of assisting persons who are really in need. I am not ashamed to say that some years ago he assisted a very intimate friend of my own—a relative on my wife's side.

19936. To a substantial extent? To the extent of something like £10—not all in one amount, but in different amounts on various occasions.

19937. The person to whom you refer was in no way related to Mr. Carter? In no way related. Mr. Carter always had the name for generosity. I knew his father also; he also had the reputation of being a most generous, good-hearted, old man.

TUESDAY, 6 OCTOBER, 1896.

Francis Antill Pockley sworn and examined:—

19938. *His Honor.*] You are a medical man practising in Sydney? Yes. F. A.  
Pockley.  
6 Oct., 1896.

19939. You have known Mr. Carter for some years? Yes; pretty well all my life. We were school-fellows over thirty years ago.

19940. Will you tell me what you know of him in relation to his character for liberality, generosity, and that sort of thing? I think he is about the most generous and liberal man I ever knew.

19941. Can you give any special instances? Yes; I can give one. It has occurred to me quite recently. I have not a very good memory for these things, but I happen to recollect this particular instance. It was a case in which two children, the sons of a gentleman at North Shore, in a spirit of mischief, got into a place where explosives were stored for use in connection with Carter & Co's sewerage works. They were playing there, and an explosion resulted which blew off the hand of one of the children, and which also resulted in the loss of one of his eyes. There were four doctors in attendance upon him for a long time, especially with reference to the eye, which they were naturally anxious to save. Mr. Carter, although neither the contractors nor their workmen were to blame, voluntarily came forward and defrayed the whole of the expenses in connection with the case.

19942. The parents, I suppose, were poor people? No, they were not.

19943. Is there any other instance you can mention? I can remember another instance, which I may as well give for what it is worth, inasmuch as it shows that Mr. Carter can be generous to his foes as well as to his friends. He had a very good claim for damages against a very powerful corporation, which had grievously wronged and insulted him, and he withdrew from all proceedings because the corporation apologised. I think under the circumstances—and I knew them all—very few other men in Mr. Carter's position would have withdrawn, considering the indignity and the insult he had received. I may say that even as a schoolboy Mr. Carter was always generous and liberal, sharing everything he had with his friends and mates. He is generous and liberal in a marked degree—in fact, I think it is as natural to him to be unselfish as it is to most men to be the reverse.

19944. Since you are here, there is one question which I should like to ask you as a medical man;—I should like to know whether you have ever gone into the question of the effect of what is known as guttering and gadding—that is, the dispersion of fine sandstone dust upon the lungs? I have no personal experience in the matter, but I know from my reading that it is very injurious. I know, of course, that there have been cases in which injury has resulted to stonemasons from the cause you mention.

19945. Is there any comparison, do you know, between the effect of fine sandstone dust and coal dust upon the lungs? They both produce forms of phthisis.

19946. Which is the worse of the two? I could not say. I think it would be more a question of the amount of than the nature of the particles.

19947. Is it possible to keep them out of the lungs in any way? It is possible to keep them out, to a large extent, by using respirators; but workmen will not use them.

19948. It is difficult, perhaps, for them to do so under the circumstance of the short supply of air? Not only that, but I may mention what occurred in Sheffield, where among the knife-grinders the average duration of life is very short. Respirators were recommended, and, it being found that these to some extent mitigated the danger, there were more applicants for employment. As a consequence, wages fell, and the men thereupon declined to wear the respirators, preferring a shorter life and higher wages.

19949. And that argument, you think, might apply to miners? It might.

19950. As to the comparative effect of the fumes of blasting powder and of fine silica dust, what have you to say as to that? I could not say what the comparison would be.

19951. What should you say as a matter of opinion? It would depend, I should say, upon the explosive which was used for blasting. For instance, I know that the fumes of roborite are injurious. I do not

F. A.  
Pockley.  
6 Oct., 1896.

know anything of a special nature about the other explosives; I do not know whether the fumes of blasting powder are specially injurious, but I should not be inclined to think they were.  
19952. Chemically, there is no particular reason why the fumes of blasting powder, as ordinarily used, should be very injurious? No; the so-called fumes would be only fine particles of carbon and burnt sulphur.

19953. Sulphide of potassium? Of course there would be nitrate of potash in the powder. I do not exactly know what would be the constituents of the blasting powder used; but the quantity of particles would be so much less than the particles of fine dust from the sandstone that I should think the so-called fumes would not be nearly so injurious as would the dust.

William Valentine Miller sworn and examined:—

W. V. Miller.  
6 Oct., 1896.

19954. *His Honor.*] What is your present position? I am a civil engineer. I am doing a little commission business at present, but no engineering.

19955. You were at one time employed in the Public Works Department? Yes.

19956. Up to what time? Until the 31st October, 1893.

19957. In what capacity? Recently as resident engineer in Glen Innes. Prior to that I had served in the Railway Construction and Survey Department.

19958. But you were more recently employed as road engineer in the Glen Innes district? Yes.

19959. The road engineers used to be called road superintendents? Yes; and they were afterwards called resident engineers.

19960. You left the Department, I understand, in consequence of retrenchment? Ostensibly.

19961. You addressed a letter to the Commission in consequence of a notice which you saw in the newspapers the other day? Yes.

19962. Will you tell me how long you have known Mr. Carter and what you know about him? I knew him when I entered the Railway Department in 1881. We were in the same office—that is, in the railway survey. We knew one another casually, that is all; we were simply office acquaintances.

19963. Has your acquaintance continued since then? I saw a little of Mr. Carter afterwards. Of course whenever we saw one another we spoke. We were friendly, but we were not intimate friends at any time.

19964. Can you speak as to Mr. Carter's general reputation for liberality? I have heard that he is a very liberal man indeed; but I can speak most confidently upon the point from my own knowledge. Since my retrenchment in 1893 I and my wife and family have suffered considerable hardship. We were almost entirely without means of support, and we were, to a large extent, dependent upon the assistance which we received from friends and acquaintances of one kind or another. Mr. Carter, as I have already mentioned to your Honor, had no intimate friendship with me at all. He was friendly with me in precisely the same way that he was friendly with other office companions. I wrote to him in April of this year pointing out that we expected some money from England, some money which was due to my wife, and asking him whether he could manage to make me a temporary advance of £10, offering at the same time, if he would do so, to pay any commission or interest which he might consider fair. I received a letter from him, in which he said that he would be very glad indeed to advance the money required. I accordingly waited on him and received from him a cheque for £10. He refused to take any kind of consideration for it. I wanted him to take interest, because, as I pointed out to him, some months might elapse before I should be able to return it. He said, in a jocular way, that he was not a money-lender. He absolutely refused to take any consideration. I never had any business connection with Mr. Carter, therefore it is impossible to suppose that he could have been influenced by any but philanthropic and generous motives. I may remark that I returned him the money as soon as I was in a position to do so—that was on August 7th last.

19965. In the meanwhile did he ever ask you for it? No; he never made the slightest reference to it.

19966. Had you, while you were in the Department, any work to do in relation to Mr. Carter's contracts? None whatever; I never had any business connection with him.

19967. Is there any other matter you would like to mention in relation to the question before this Commission? In regard to the contracts under discussion, of course, I know nothing. Your Honor has the letter which I addressed to you, and if you desire to ask me questions upon the matters referred to in that letter I shall, of course, be glad to answer them.

19968. The question is whether you have any knowledge of any facts which are in any way relevant to the questions which are before this Commission? I take it that this Commission is only in connection with a few contracts.

19969. The questions before the Commission are connected with any contracts in which any members of the present firm of Messrs. Carter, Gummow, & Co. have been concerned? I know nothing whatever about any of them. You might have noticed, in the letter which I addressed to your Honor, I expressed an opinion, but the information I could give might not be considered in any way relevant to the inquiry.

19970. The opinion which you expressed in your letter may be founded upon facts which are relevant to the inquiry? But the facts are not in connection with any of these contracts. That is the difficulty, to my mind.

19971. Are they indirectly connected with them? They, of course, affect the position of Mr. Hickson to a certain extent. It is a matter for your Honor's consideration as to whether you will go into the question or not. I am most anxious to get the matter ventilated, and have done my best to ventilate it on various occasions, but have failed entirely. I have suffered very much indeed from my retrenchment, and I believe that I have suffered wrongfully. If your Honor went into my papers you would see that I had endeavoured to do my duty both in the Railway Department and in the Roads Branch. I have letters from different officers in the Departments with which I have been connected, and they all speak very highly of me. I have a university degree, and as far as I know there is nothing whatever against me. Yet I was retrenched from the service by Mr. Hickson, and was thrown, with a large family, on to the world. Considering that on account of my family I was bound to remain in Sydney, I think I was treated in a shameful manner. I think the way in which I was treated, and all the matters connected with my treatment, go to show that Mr. Hickson is not a fit and proper person to be the head of the Public Works Department.

19972.

19972. On what ground? On the ground that he cannot manage the department properly; that he has no efficient control over it. There is no reason whatever why I should have been singled out, as I was, for retrenchment. W. V. Miller.  
6 Oct., 1896.

19973. Do you think that Mr. Hickson, as far as ability is concerned, is not a proper person to hold the office he holds? Yes.

19974. Does your opinion extend beyond the question of ability, or is it limited to that? Well, ability is a very large word. I am not talking of Mr. Hickson's professional ability only. I hold that at the time to which I refer he was not fit to hold the position of chief of the department.

19975. You are referring now to the question of Mr. Hickson's ability to command, not to the question of his honesty or integrity? Quite so.

19976. In your opinion, Mr. Hickson has shown a want of that knowledge which a man in charge of a large department such as the Public Works Department ought to have;—is that it? Yes; I say that he has shown a want of judgment of character.

19977. *Mr. Davis.*] You were very sore about your retrenchment? Very sore indeed; and I am so still.

19978. You have agitated a good deal in reference to the matter, and you have endeavoured, as far as you have been able to do so, to get back again? Yes.

19979. Has it been your opinion at any time, since you have been retrenched, that politics had anything to do with your retrenchment? It is rather difficult to say what you mean by politics. I think they had a great deal to say in the matter from this point of view—that a man may be open to be got at by an efficient and good lobbyist. It does not depend altogether upon the question of his trying to do anyone a political turn, but he may be too weakminded to hold his own. That is my opinion of Mr. Hickson. I do not think he is a fit person to be the head of the Works Department.

19980. Did you at any time think that the fact of the late Minister for Works being in office had anything to do with your retrenchment? I think it is possible that it had to a certain extent.

19981. You do not know what opinion the superior officer immediately over you formed of your professional ability immediately before your retrenchment? He sent word to me—he took care to do so—that my retrenchment was in no way owing to him.

19982. You served under Mr. Statham? Yes.

19983. And you know what he thought of your professional ability? Yes. I have no objection to state what his opinion was. His opinion was that I was the worst officer in his division, and that I was utterly incapable. He refused to be responsible for the work in the Glen Innes District as long as I remained in the division.

19984. Mr. Statham was the divisional engineer? Yes.

19985. So that you had to do with him directly? At one time I had.

19986. The opinion you have mentioned to the Commission was the opinion he formed of you? Yes.

19987. In the face of that opinion, are you at all surprised that you should have been retrenched? I am very much surprised.

19988. Does it not occur to you that you have been a little unjust in speaking of Mr. Hickson in the way in which you have spoken of him this morning? The facts of the matter are these: When I was sent to the Glen Innes District it had recently been transferred from the charge of Mr. Statham to that of Mr. Stillwell. Mr. Stillwell, when he took charge of the Glen Innes, Tenterfield, and Armidale, Districts, found that they were in a most deplorable state of mismanagement—that they had been mismanaged for years. If your Honor were to look up the reports of Mr. Stillwell, who was one of the most energetic and capable officers the department has ever known, you would be able to form an opinion of the extent of the mismanagement. I replaced Mr. Norman Hay. Mr. Hay, although naturally a brilliant young man, was unfortunately addicted to drink—in fact, the whole district had been mismanaged for a number of years. The roads were in a most unsatisfactory condition, as Mr. Stillwell's reports will, I believe, very fully show. The officer at Tenterfield and the officer at Grafton were both expecting to be got rid of. They were both shaking in their shoes. I had that from Mr. Statham himself. He said: "Mr. Williamson is expecting to be dismissed, because of the manner in which the district, in the opinion of Mr. Stillwell, has been mismanaged." Mr. Donnelly also expected to be turned away from the same cause. When I took charge of Glen Innes District I received precise instructions from Mr. Stillwell that reforms were necessary, and that the whole management of the work must be started on a new footing; that we were no longer to make the roads in the way in which they had been made—in all sorts of shapes and forms. Having received these instructions, I did my best to carry them out. I went to work energetically, and started to take levels. I took proper sections of the roads, and did all I could to bring the contractors down to the position in which they ought to have been, for they had had the upper hand for years. I honestly did my duty, and what was the result? The officer at Tenterfield had political influence, and the officer in the south, Mr. Donnelly, also had political influence, his brother being a Member of the Assembly. The result was that in a very short time Mr. Stillwell was removed from the district, and Mr. Statham was put back again. In what kind of a position was I who had done my best to do my work? Every bit of work I had been doing since I had been there was a reflection upon Mr. Statham.

19989. That is the way in which you put it generally? Yes. I can prove that Mr. Statham wrote a letter insinuating that I was a thief, before he had even seen me, the foundation for the insinuation being that I was absent from Glen Innes on roadwork for a couple of days, and that I had charged for those two days. He said that without the most convincing proof he would refuse to pass the voucher. I think my retrenchment under these circumstances showed a want of knowledge on the part of Mr. Hickson—that he paid no heed to the difficulties in which I was placed through the sending back to the division of Mr. Statham.

19990. *His Honor.*] In what year was Mr. Statham sent back to the district? In the year in which I was appointed—in May, 1890.

19991. That was ten months after Mr. Hickson had been appointed Commissioner for Roads? Not long after that.

19992. So that the work which had been done so badly had mostly been done under Mr. Bennett? I suppose it had.

19993. In point of fact, did not Mr. Hickson, when he took the works over from Mr. Bennett, try to go in for a good many reforms and improvements in roadmaking and in management generally? I do not know whether he did or not. I have never spoken to Mr. Hickson except on one or two occasions, and then only for



W. V. Miller. for a minute or two. I know very little about him outside of my department, but I feel it very much, considering the number of offices with which I have been connected, that I should be treated in the way in which I was treated by him.

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19994. Still he was comparatively new to the work at that time? I believe he was.

19995. *Mr. Davis.*] What you blame Mr. Hickson for is lack of judgment in perceiving your ability and perseverance? What I say is that he relied on Mr. Statham in a position where the facts alone ought to have shown him that Mr. Statham was not reliable. Any reasonable man would have understood the difficult position in which I was placed.

19996. *Mr. Parkes.*] I presume you came here this morning more with the object of ventilating your own grievance than to give a character to Mr. Carter? That is not the fact. I came here because I consider that Mr. Carter behaved to me in the most generous manner. Immediately I saw His Honor's intimation published in the newspapers, I felt it my duty to address him a letter on the subject.

George Lyell sworn and examined:—

G. Lyell. 19997. *His Honor.*] What are you? A quarryman.

19998. I believe you know something about the sand that was supplied to Contract 118, at Johnstone's Creek—the storm-water channel contract? Yes.

19999. What do you know about it? I supplied a lot of stone to several of the carters there; and I know that it was good stone.

20000. What quality of stone was it? It was equal to the Pyrmont stone—first-class block.

20001. Was any bad stone supplied from your quarry for this contract? To my knowledge, there is no bad stone in the quarry. If there were, the carters would not take it. They would know that it would be thrown out by the inspector, and that there would be a row about it.

20002. The carters, you say, were very particular as to the stone they took from your quarry? Yes.

20003. How much of the stone required for the contract was supplied from your quarry, do you think? I think I supplied 800 or 900 loads. I supplied Meredith, Burcombe, and McMillan.

20004. Where is your quarry? In White-street, Leichhardt.

20005. How far would that be from the storm-water channel? Not more than half a mile.

20006. Do you remember when you began to supply the stone? I believe it was about this time last year.

20007. And you continued to supply it for how long? Up to the time the job was finished.

20008. When was that? I last supplied McMillan about two months ago.

20009. Do you know what other stone has been supplied to the same contract? I know that McMillan was getting it from other places.

20010. Can you speak from your own knowledge as to the quality of that stone? It was of good quality.

20011. Are there any other facts of which you desire to inform the Commission in relation to this inquiry? No, except this—I may state that I am a disinterested party. I know neither Carter, Gummow, & Co. nor Mr. Parkes in the matter.

20012. It was only in consequence of the notice which you saw in the newspaper that you addressed a letter to the department? Yes.

20013. Do you know anything about mining? Yes; I have done mining in Victoria, New South Wales, and Queensland.

20014. Have you had anything to do with the driving of tunnels for sewer work? I have not done any driving for sewer work, but I have worked in copper-mines, and that would be pretty much the same. I was working for six years in the Mount Hope copper-mine.

20015. You know something about the practice of supplying air? Yes.

20016. What is the practice? Various methods are used. Sometimes a fan is used; sometimes a channel is cut down the end of the hole; sometimes a divider is used; sometimes what is called a wind sail; and sometimes a fire shaft.

20017. Where a fan is used, what is the practice as between the contractors and the workmen as to fixing the pipes and working the fan? If I were to take a sub-contract from another contractor, then, unless there was a special clause in the agreement to the effect that he was to supply the air, I should have to take the responsibility of doing that.

20018. Where the contractors supply the pipes and also the fan, but leave the work to the sub-contractor, what is the practice as to the working of the fan and the laying of the pipes? Unless it is specially mentioned in the agreement that the contractor is to do it, you have to fix the pipes and work the fan yourself.

20019. That is the regular practice where there is no distinct contract as to who shall do it? Where there is no distinct agreement made.

20020. *Mr. Parkes.*] Do you own a quarry? Well, I have taken up a piece of land at Leichhardt from Paling & Co., and have opened a quarry on it.

20021. Why did you come here? I saw a notice in the newspapers, and I therefore wrote to the department. I was also sent for by the department.

20022. To say what? What I have said this morning.

20023. That you supplied stone to this contract? Yes.

Frederick Joseph Cahill sworn and examined:—

F. J. Cahill. 20024. *His Honor.*] What are you? A land and estate agent.

20025. You have come here to give evidence on what subject? I have come here in answer to the request of the Commission that persons would come forward who knew anything of Mr. Carter—that is, in connection with his generosity.

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20026. Will you tell me all that you know in that relation? I have known Mr. Carter mainly in connection with a certain institution at St. Leonards. We were fellow-members of the committee at one time. Mr. Carter has always had the name of being a very generous man, and the secretary of this particular institution gave us at one time—that is, about two years ago—a little trouble. We found that he was about

about £60 short in his accounts. We went into the matter, and Mr. Carter said, among other things, that it would be hard lines to put the fellow in gaol; that he would not like to see him go to gaol. He lived opposite the institution to which I referred at the time, and his own wife and the secretary's wife seemed to be on friendly terms. Mr. Carter said that, on account of the man's wife, he would not like to see anything happen to him, and he suggested that we should square things. We did not see how we could do that, and the next stage of the matter was the receipt by us of a duplicate deposit slip for the full amount of money. Upon subsequent inquiry we found that Mr. Carter had paid the money unknown to us. He seemed to have nothing to gain by it. The secretary was a comparative stranger to Mr. Carter. He did not seem to know him any better than he was known to the rest of the committee. The way in which he put it was this—that he did not like to see such a nice little woman as the secretary's wife, who was also a friend of his own wife, put in the position of having her home broken up in such a disgraceful way.

20027. He apologised in a way for doing it? He did as a matter of fact.

20028. What was the amount, did you say? Between £50 and £60. The man had no money at all, and, I believe, Mr. Carter sent his wife home to her people in Tasmania, and gave him enough money to take him to Melbourne. Another institution at North Shore has asked me to hand your Honor a letter.

20029. Apparently something of the same kind occurred in connection with that institution, the details of which are not within your knowledge? Except that I have heard it spoken of from time to time. I knew that Mr. Carter had paid some money, and, from what I can see, there does not seem to be any prospect of his getting it back; in fact, I remember saying to him "Is there any chance of your getting a refund of that money you paid some time ago?" He said "I do not know; they seem to be a poor lot. I do not suppose I shall get any of it."

20030. Are there any other particular cases that you know of? I know that Mr. Carter has from time to time given money to the School of Arts to help it along.

20031. That he is, in effect, a liberal man? I have always found him so, and I have always heard him spoken of as such. I know that he is never appealed to in vain in connection with any charitable purpose.

Frank Moorhouse Gummow recalled, and further examined:—

20032. *His Honor.*] You desire to make a statement to the Commission? I have produced, in accordance with your Honor's request, tracings and the manuscript in connection with the Monier system which were shown to Mr. Hickson some time ago. Some of the plates are missing. They were taken out in order that they might be traced for lithographs. (*Vide Appendix No. 57.*)

20033. And the tracings you supply are the tracings of the missing plates? Yes; some of the pages of the manuscript are missing, but you will find the matter there contained reproduced in the typewritten book.

20034. So that the two books together will reproduce everything which was shown to Mr. Hickson in relation to the Monier system? Yes. Mr. Carter, as a matter of fact, handed the book to Mr. Hickson. But I know that Mr. Hickson had it.

20035. Have you the negatives of the photographs? They are all at the photographers.

20036. They can be handed over to the Government Printer, I suppose? Yes. I might mention that the smaller book which I now produce is the first document which was got out in connection with the system. That would be in 1893, and it is the book which was shown to Mr. Bagge. Mr. Baltzer informs me that Mr. Bagge never saw the second and larger book. He saw merely the first book; and that would be all the information he would have on the subject. (*Vide Appendix No. 58.*)

20037. I understand that the first book contains a shorter description of the system? Yes; the larger book is an improvement upon it: and a third book, which has been produced, is a still greater improvement. The third book was got out at the end of last year.

20038. I suppose Mr. Carter can describe exactly how the second book came to be shown to Mr. Hickson? Yes.

20039. Was either of these books shown by you or by Mr. Carter to Mr. Bagge? No; the small book was shown to him by Mr. Baltzer. I have produced it in order to show the extent of Mr. Bagge's information on the subject. You will see that he had not nearly all the information which Mr. Baltzer had in his possession.

20040. Is that all that you have to say on the subject? Except that both of the books were in my hands in 1894.

20041. *Mr. Parkes.*] Were these books prepared by Mr. Baltzer? Yes; both of them.

20042. During the time he was in the department? Yes.

John Carter recalled, and further examined:—

20043. *His Honor.*] Will you explain the circumstances under which the book which Mr. Gummow has produced came to be shown to Mr. Hickson? Yes; I remember this manuscript very well. It is in Mr. Baltzer's handwriting. It is, in fact, his translation from German literature on the subject. He showed it to me in the first instance. I read it through thoroughly, and took it to Mr. Hickson some years ago. I should say it would be three years ago or more. I took it to him just to let him have a look at it, thinking that it would be likely to interest a man in his position. When I got it back from him I cannot say.

20044. Was that before or after the offer of Mr. Armstrong to sell the patent? It was before that.

20045. You merely showed it to Mr. Hickson as a matter of ordinary interest? Just as I would show to a man in his position anything which came under my notice, and which I thought likely to interest him as an engineer.

20046. For how long did Mr. Hickson keep the book? For some considerable time.

20047. For weeks or months? For months. It was a good time. I suppose he kept it simply because I did not call for it, as much as anything else. The probability is that I forgot about it for some time. I fancy, now I think of it, that Mr. Baltzer reminded me that the book was out of our possession. It must be three or four years ago.

20048. It was after you had taken out the patent? Yes.

20049.

F. J. Cahill.  
6 Oct., 1896.

F. M. Gummow.  
6 Oct., 1896.

J. Carter.  
6 Oct., 1896.

- J. Carter.  
6 Oct., 1896.
20049. Did Mr. Hickson return you the book personally or did you find it in the office? Mr. Hickson gave it to me.
20050. Did he make any comment upon it? There was probably some discussion about it; it is not likely he would simply hand the book back to me without saying anything; he would naturally say something about it, but I have forgotten what it was.
20051. I suppose that, on the occasion when you did get the book, you went to call for it? Yes.
20052. *Mr. Gummow.*] Do you remember lending the book to any other architects or engineers? I think I lent it several times.
20053. Did you ever lend it to the City Architect? Yes; he had it several times. He was anxious to introduce the system into the George-street markets. He told me that the thing had been hanging fire for twelve months for the want of information, and that he had been unable to obtain it. He explained to me that even at the last moment he had seriously considered the advisableness of altering the design, with a view to the use of the patent. I lent him the book, and I had a number of interviews with him on the subject.
20054. *His Honor.*] What had he in the design in the way of fireproof material in the flooring? Terra cotta lumber, fixed in between iron girders.
20055. Flat arches? Yes. I do not know much about it, except that terra cotta lumber was to be used. I know that we tried the lumber for Mr. M'Rae in the furnace out at Annandale.
20056. It did not turn out well? No; it was not up to the imported article; it had been locally manufactured.
20057. *Mr. Parkes.*] The sawdust was not burnt out of it? I presume that that was what was the matter; it crumbled up into so much dust.
20058. *Mr. Gummow.*] The city markets were let to a contractor before you showed this book to Mr. M'Rae? Yes; that was the obstacle as far as I know. It would have been an interference with the contract. Mr. M'Rae certainly held out every hope of the thing being used in the future if he had the opportunity to use it.
20059. You also took the book down to Melbourne at one time? Yes, to show it to you.
20060. You let me have it for two or three months, before I was an interested party in the matter? Yes.

Joseph Davies recalled and further examined:—

- J. Davis.  
6 Oct., 1896.
20061. *His Honor.*] One of the witnesses—especially Melville—and other witnesses also have alluded to the fact that the men used to come to work some two hours or so before the inspectors came on to the job;—was that the fact? It is not the fact, and if Melville did it I can only say that if the Department had known it before he would not have stopped in his position as long as he did. The inspectors have strict orders to be on the works during the whole time there is any work going on—that is, work which requires their supervision—so that, supposing, as often happens, a piece of concrete is commenced and cannot be finished in eight hours, and the contractors have to stop an hour and a half or two hours longer, as the case may be, the inspectors have also to stop during that time. They are not allowed overtime, but they get consideration for it, it being provided that they are to be paid for public holidays in consideration of the extra time they work. They are supposed to be on the ground when the contractors commence work, and they are not supposed to leave it until work is finished.
20062. Melville said that the inspectors were not supposed to be on the ground until 9 o'clock in the morning, whereas the workmen would begin their work at 7 o'clock in the morning? That is all nonsense. The inspectors, to my own knowledge, are there every morning at the time the workmen are there.
20063. And if an inspector chooses to stay in bed too long and comes on to the work at 9 o'clock in the morning he is not doing his duty? No; a permanent arrangement of that kind would be utterly ridiculous.
20064. I suppose that if an inspector were found doing that kind of thing he would be run out of the department at once? Yes.
20065. The question has been raised as to the amount of waste which takes place in rendering. Suppose that the soffit of the sewer as well as the invert is rendered, there would be a good deal of dropping from the soffit—is that dropping, in point of fact, wasted? No, it is picked up again with the plasterer's trowel and put back. The plasterers have the compo. brought into the invert of the tunnel, and they use it from there, the invert of the tunnel being cleaned before they start to plaster. I have found in some cases little pieces of candle grease; but, apart from that, no dirt could get into the compo. It would be perfectly proper to use the droppings.
20066. It would not be proper to leave bits of compo. which had fallen from the soffit of the arch on to the finished invert? No; the invert is finished the last of all—and for this reason—that the men have to stand on the invert while they are plastering the sides and soffit. When they have gone through between two shafts, they would start in the centre and work up each way and put in the invert of the finished sewer the last thing, so that there may be no traffic over it. It frequently happens that, by some mistake, a workman has not known that the plasterers had been at work, and in some of those cases the invert has been so seriously damaged by traffic that it has had to be taken up again. In some cases—and this has been the experience of all contractors to a greater or less degree—a small or a large quantity of water may come down the invert before the plastering is set and may wash away some of it.
20067. But the point is that the whole thing must be left absolutely smooth and finished as the men work backwards? Yes.
20068. So that they could not waste any rendering? No; I should say that there would be no waste in connection with plastering in that way. It is not like plastering the side of a house.
20069. What about the waste in using cement mortar in putting in the arching? There could be very little waste in the arching, because in the small sewers the arching is on a drum, the centering of which is enclosed, over the whole surface, with close lagging. The drums are used for turning the arching, and they are brought forward as each length is finished. I do not see, therefore, how there could be much waste in that connection. Necessarily there is a little waste. I cannot quite explain it, but it is the fact that after the bricklayer has finished, and after the bluestone concrete has been put in, the tunnel requires to be cleaned out before the plasterer commences. By some unaccountable means there is a little waste, but it is not a very serious thing.
- 20070.

20070. I suppose it would be so much to the interest of the contractors to prevent the waste of cement as available material that it is brought down to a minimum? Yes; the contractors look after their interests in that way.

20071. *Mr. Parkes.*] When they are building the arching I suppose they must take the centres away before they tuck-point the work? It is not tuck-pointed. It is simply cut and struck.

20072. But they take away the drum, do they not, before doing that? A drum is long enough to enable the workmen to lay four bricks—that would be 3 feet; and immediately that length is turned and pointed the centering is struck. That enables the men, while the compo. is green in the joints, to clean off the brickwork and do any necessary touching up; so that, while the labourer is packing one drum, the brick-layer is pointing the other.

J. Davis.  
6 Oct., 1896.

THURSDAY, 8 OCTOBER, 1896.

Edward Hungerford recalled and further examined:—

20073. *Mr. Davis.*] You received instructions from the Commission to look for the journal of Contract 72 some three or four weeks ago? Some time ago—I could not say how long.

20074. Will you say what you did when you received those instructions? I went down to the then Custodian of Plans, and, as far as we knew, we searched through every corner and pigeon-hole in the plan-room where such books as journals would be likely to be kept. We turned over quite a hundred books, I should say, but did not succeed in finding this particular journal.

20075. You know that there has been considerable confusion in consequence of the repeated changes which have been made within the last few years in the location of the Sewerage Branch? Yes. Of late years we have been moved about a great deal.

20076. What has been the result as regards papers and plans and books generally in the branch? They are very hard to find.

20077. Did you look for the site plan of Contract 72 in conjunction with Mr. Scanlan? No; that would be outside of my province.

20078. *His Honor.*] You might give a short account of all the moves through which the branch has gone within the last few years, with the approximate dates? In 1889 the branch was moved to Lincoln's Inn Chambers, in Elizabeth-street, from this office. It was afterwards moved next door to those chambers. Then in February, 1893, the branch was brought up to one part of this building. I think we were afterwards moved into three different parts of the building. In March, 1895, the branch was moved down to the Water and Sewerage Board's offices in Pitt-street, and about nine months after that to Riley's Buildings, in Bathurst-street. Now it has been moved back here again.

E.  
Hungerford.  
8 Oct., 1896.

James Watson Fraser sworn and examined:—

20079. *Mr. Davis.*] What is your position in the department? I am Custodian of Plans.

20080. You received certain instructions yesterday afternoon? Yes.

20081. What were they? To find the general plan for Contract 72.

20082. Did you also make a search for the journal of Contract 72 in the plan-room? I did.

20083. You eventually discovered it? Yes.

20084. Where did you find it? In a cabinet.

20085. Was it with other books? No, it was not.

20086. It was not in a place where it would be likely to be looked for? No; it was with some old sewerage papers.

20087. Do you also produce the register of the plans? Yes.

20088. Will you turn to the registration of the plans of Contract 72? Yes; it shows that the general plan for Contract 72 was handed to the Commission on the 21st May of this year.

20089. *His Honor.*] I see there is a note opposite the entry of the plan to this effect—"Mr. Davis, Royal Commission";—in whose handwriting is that;—it appears to cover Drawing No. 1, the ground plan? It is in the handwriting of Mr. Scanlan.

20090. Do you think that assuming the "upper portion extended" to have been really not an extension, but only a delayed completion of the original scheme, the "general plan" alluded to here would be likely to show the whole subject matter of the contract, including what would be shown upon the plans which are entered under the heading of "upper portion extended"? I think it is very likely that it would.

20091. You do not think that a tracing would be likely to be entered here under the heading of the general plan? No; there would be no entry of any tracing here. The registers of tracings and heliographs would be kept in a separate book altogether.

20092. All that you can say is that this book, if it be correctly kept, indicates where the plan is? Yes.

20093. And according to the book the plan has passed into Mr. Davis's possession, apparently for the purposes of the Commission? Yes.

20094. Of course, at that particular time, that is the 21st of May, you yourself had not custody of the plans? No; and I may say that if we have wanted anything hitherto, and it has been entered in the register as having been sent to the Royal Commission, it has invariably been found in the Board-room.

Michael M'Mahon sworn and examined:—

20095. *His Honor.*] You have been living at M'Mahon's Point for some years? Yes; for the past twenty-five years.

20096. During which time you have known Mr. Carter? For a great portion of that period.

20097. You have come here to-day voluntarily to say something in reference to the notification which you saw some days ago in the newspapers? Yes.

20098. Will you tell me what it is you wish to say? About two years ago, on Christmas Eve, a friend of mine, whom I knew to be very hard up, came to me for relief, and, as I could not myself relieve his necessities at that time, I suggested to him the name of Mr. Carter. I know that when he mentioned the matter to Mr. Carter that gentleman gave him £7—handing him, in fact, all the money he had in his pocket at the time—and that he subsequently gave him another £3. I know as a positive fact that Mr. Carter has not asked the man for the money from that day up to the present time.

J. W. Fraser  
8 Oct., 1896.

M. M'Mahon.  
8 Oct., 1896.

20099.

- M. M'Mahon. 20099. How long ago was the money given to him? About two years ago.  
 8 Oct., 1896. 20100. Was this person a stranger to Mr. Carter? He was merely an acquaintance—nothing more. He happened to be a gentleman living at North Shore.  
 20101. Can you mention any other case? Yes. It is the case of a plasterer who used to work for me. He was very hard up, and he came to me for assistance, as a number of other persons were in the habit of doing. I used to relieve their necessities when I could afford to do so; but I received a knock in the commercial crisis a few years ago, as did a number of other persons, and I suggested Mr. Carter's name to this person also. I told him that I knew Mr. Carter to be a very kind and liberal man, and I said I was sure that if he explained the matter to him he would render some assistance. The furniture was mortgaged up to the hilt, the interest had accumulated, and the man was, of course, afraid of losing it. Later on I met the man in William-street, and he told me that Mr. Carter had very kindly taken the matter up for him.  
 20102. You mean that he had saved his furniture? Yes. I do not know whether the man repaid the money to Mr. Carter or not; but he told me that he was in great distress, and he would certainly have lost the furniture had not Mr. Carter come to his rescue. Those are the only two cases of which I can speak from my own knowledge; but I know, from hearsay, that Mr. Carter has been very generous, and that very few persons have gone to him in trouble whom he has not assisted. That is the common report.  
 20103. That was the reputation which he had two years ago—it is the reputation he has at the present time? Quite so. He was known to be a successful contractor; he was regarded as being a well-to-do person, and, knowing him to be generously inclined, persons frequently went to him for assistance.

FRIDAY, 9 OCTOBER, 1896.

Joseph Davis recalled and further examined:—

- J. Davis. 20104. *Mr. Parkes.*] Can you tell me how your value of 12s. 2d. for subducts is arrived at in the case of Contract 69;—how did you arrive at that value? In the first place, I ascertained from the specification what was included in the price for subducts—items 24, 25, 26, and 27. As regards items 24 and 25 it is stated in the schedule that they are for subducts in more or less hard material, including dry or cement jointing for stoneware pipes. Items 26 and 27 refer to water charged, loose, ground, as specified in clause 8, and include hardwood boxes, with packing, and dry or cement jointing for the pipes. They are of 6-inch and 9-inch internal diameter. In the case of items 24 and 25 it does not state that the price is to include the packing over the pipes—the packing that has to be put in between the top of the pipes and the lower side of the lining of the sewer—but I assumed, for the purposes of comparison, that that was stated, so that there should be no doubt on the point. In addition to the prices given for these items in the tenders named in my list upon page 499 of the evidence, the cost of the excavation is included. First of all, for items 24 and 25, I have taken the material specified from 5 to 11 in the schedule, and by that means I have ascertained the cost of the excavation, under Carter, Gummow, & Co.'s schedule, under John Ahearn's schedule, and so on right through, using the same items in each case.  
 9 Oct., 1896. 20105. *His Honor.*] The question is how you arrived at the amount of excavation per lineal yard—the average depth and width? I took what is specified and shown in the drawings. I should have to get my papers to say precisely how the amount was arrived at.  
 20106. You went by the drawings? Yes.  
 20107. I suppose the amount of excavation would vary a little according to the distance of the shafts from one another, and according to the running grade of the sewer itself? Yes, it would vary; but I have taken an average. What that average was I could not tell you precisely now. I have allowed for what would have to be taken out and paid for if subducts had been carried out.  
 20108. Would the excavation be considerably larger than the internal [diameter of the pipes? It would have to be large enough to put the sockets in, and the sockets, I suppose, would be probably  $2\frac{1}{2}$  inches larger than the internal diameter of the pipes.  
 20109. By sockets do you mean the flange rings of the pipes? Yes; I have taken the precise cost of the subducts to the Department under the several tenders. I have first of all taken the price for the subduct itself, which includes in the one case boxing and a 4-inch stone packing over the boxing, and in the other case the pipes and the filling, with no boxing; and the excavation, which clearly has to be paid for according to the schedule.  
 20110. The filling is paid for separately? I think there would be a doubt about that in regard to items 24 and 25. It does not appear to be included in those prices; and it is possible that if we had carried out subducts under items 24 and 25, we should have had to pay the contractors for the dry stone packing, as it is not mentioned. However, I have not taken that into consideration. If I had taken it into consideration, it would have made the subducts a little more costly. The comparison would have been the same.  
 20111. *Mr. Parkes.*] I will ask you to read clauses 104 and 105 of the specification, which appear upon page 94 of the Parliamentary return? They are as follows:—  
 104. Sub-ducts to be constructed, when decided on, along lines of tunnels and open trenches, commencing on each length midway, or thereabouts, between two working shafts or faces, 33 inches below invert of main sewer, branches, &c., or as shall be directed at the time, and having a fall towards each working shaft or face, of such gradients as may be determined at the time, after the thickness of sewer-lining required for each length between shafts or faces has been ascertained and ordered. Subducts of 9 inches, or of a greater or less internal diameter, if directed, to be laid immediately underneath the timber floor of tunnel or open trench, or at sides of sewer, in hardwood boxes varying in size and dimensions as shown on drawing. Said boxes to be laid straight and true to levels decided upon, and the pipes to be laid therein, upon, and surrounded by, sandstone chippings and quarry refuse. Dry stone packing to be put over pipes, as specified in clause 21.  
 105. In solid and disintegrated rock the excavation for subduct to be executed as shown on cross-sections, and as shall be directed, and the subduct to consist of glazed stoneware spigot and faucet pipes of 9 inches internal diameter, more or less, as the case may be. The pipes to be jointed dry, and the filling above same up to underside of sewer lining to be of dry stone, hand-packed, as above described. The Engineer may also, if he deems it necessary, order the pipes to be jointed, altogether or in part, with tarred gasket  $1\frac{1}{2}$  inch deep, and cement mortar  $1\frac{3}{8}$  inch deep, the mortar to be prepared of one part cement to two parts of sand.  
 20112. That is included in the items 23 to 27? No; it is not. What is included in those items is stated in the schedule. This specification is in regard to the way in which the work is to be done. It has no reference

J. Davis.

9 Oct., 1896.

reference whatever how the work is to be paid for.

20113. If you turn to the schedule at page 63 you will see this item: "Subducts, as specified in clause 8, of 6-inch and 9-inch internal diameter";—that is pretty clear, is it not? Yes; it is clear that it includes the pipes and the jointing in the case of items 24 and 25, and the pipes, the packing, and the hardwood boxing and jointing, in the case of items 26 and 27, but not the excavation. The excavation is included under the item of excavation, as I can show you.

20114. *His Honor.*] That is quite clear, I think; the word "subduct" occurs in the item of excavation? Quite so. What I say is that the comparison which is made in my evidence upon page 499 shows what would have had to be paid had the subducts been carried out.

20115. And you say that you have put it down at a rather lower amount than it might be—at a lower amount than, according to your construction of the specification, contractors might be entitled to claim? Yes.

20116. In some cases? Yes; in the case of items 24 and 25.

20117. Because in those cases a contractor might contend, and possibly effectually, that he had a right to be paid for the hand-packed filling? Yes; that is my view.

20118. But you have left that out? Yes.

20119. *Mr. Parkes.*] You will see that the schedule refers you to clause 8 of the specification, and that clause 8 again refers to clauses 104 and 105, the clauses you have already read? Yes.

20120. So that really the only thing you could claim would be that the excavation item should be added? That is all I claim; but I say that clauses 104 and 105 simply state how the work is to be done, whereas the schedule tells us how it is to be paid for.

20121. *His Honor.*] Does the question of margin apply at all to the item for excavation? No.

20122. If the contractor blew out too much rock, that, as far as the excavation is concerned, would be done at his own loss? Yes; he would not receive a penny for the excavation or for the removal of the excavated material. The only consideration he gets is that he is allowed a little extra in the lining. It is thought that it is not practicable to take out these tunnels to the precise size ordered; but in order to keep the contractor in check he is told first of all that he will not be paid for any excavation that he has done over and above what is ordered; and, secondly, it is considered reasonable that he should be allowed a little extra in the lining.

20123. *Mr. Parkes.*] How comes it then that in contract 69 this excavation was paid for to the outside of the timbering? That is another matter entirely.

20124. *His Honor.*] That appears in the specification? Yes; the margin has to do with blasting, and blasting only.

20125. *Mr. Parkes.*] Was there not blasting in the case of contract 69? The fact that timber was required was proof positive that there would not be blasting.

20126. *His Honor.*] The contractor, I suppose, might have to use struts in the case of loose ground, but that would be a different thing from ordinary timbering? Yes; the timber would be taken out as the brickwork and concrete are put in.

20127. The whole question resolves itself into this: whether your calculations are correct as to excavation? Yes; what I say is that I have taken a fair average for the excavation, and that I have used the same quantities in each case. I have got out a comparison under exactly the same conditions for the seven tenders.

20128. Is blasting allowed at all in the taking out of rock for subducts, or has the rock to be taken out by handwork? It has to be taken out by handwork, to all intents and purposes. At the top they might put in a few small shots. They would use a hand-drill and put in a small quantity of powder to take off the subduct just at the bottom of the tunnel, but the lower portion would have to be taken out with picks.

20129. Because, I suppose, blasting might blow away the floor too much? Yes; you simply want a small cut, wide enough to put in your pipes.

20130. I will now ask you a question or two upon a matter which has cropped up in my mind on going through the evidence. Mr. Bagge, at page 407, question 13162, alluded to some occasions on which concrete lining had not been put in, and in which other material had been used instead of concrete. He said that in consequence of that, or that after that, there was a discontinuance of the system of putting in concrete lining. I understood him to mean that the substitution of other material for concrete had its origin about that time. In Mr. Millner's evidence, upon page 420, question 13535, he mentions the packing of the Emily-street branch with what he calls "muck" instead of concrete; but he gives no further explanation of that. I want to know whether these witnesses are referring to one and the same occasion, or how Mr. Bagge's evidence can be explained, as far as your knowledge goes? What Mr. Millner refers to there I can say, from own knowledge, is shale.

20131. By "muck" he meant shale? Yes; it is usual to pack tunnels through shale with the material which is excavated, and that was done in the case of the Emily-street branch.

20132. But was there a departure from the former practice at that time, or had it been usual to pack with the excavated material before that time? That has always been the custom in the case of shale.

20133. And not to pack with concrete? No, except in two or three cases where we have had to go under heavy houses. I remember that in the case of the Elizabeth-street sewer, opposite Belmore Park, we had to remove part of the foundations of houses in order to get in the sewer, and in that case we packed the whole of the tunnels solidly with concrete; but it is only done in such cases.

20134. Then what does Mr. Bagge allude to; he said that you were disgusted at finding that the work had been done in that way, and that in consequence of that a new departure was instituted;—that is what his evidence implies? Yes; I remember the circumstances. It was in connection with Contract 83—a contract of O'Neil and Rogers—a branch of Contract 69. It was let at the same time as was Contract 69. I was out there one day, and I found that the men at the top of one of the shafts were mixing what they said was concrete, but which, in my opinion, was simply sand and stone. I stopped the work. I saw that this material was being put down and was being used, and I told the contractors that they were not to do anything more until I had had an opportunity to examine the whole of the work. It was late in the evening when I made this discovery, and on the next day I went below and had some of the work removed. The first 2 or 3 feet of the work were excellent; and I had an idea how that came about, although I need not mention it now. On going beyond



J. Davis. that point, however, I came to packing which was precisely of the same nature as the mixture which I had seen at the top of the shaft. I had a good long length of this taken out, and I found that it was all the same kind of work. The principal partner was at the time in Tasmania, so, after consultation with the other partner, I said, "Perhaps, in fairness to your absent partner, it would be better to do nothing more in the matter until he has returned." We waited, accordingly, until he came back. I then put a man on the job with instructions to take down any work of the same description as that which I had seen, it being impossible for me to remain there during the whole of the time. The contractors sent some men to take down the work, and they took down a large quantity of it. Then the principal contractor came to me and he said he did not think he would take down any more. I said, "Very well; you can please yourselves about that, but until we are satisfied that there is no more of that kind of work done, we cannot allow the work to proceed. If you proceed with the work you will do it at your own risk. Moreover, we cannot pay for it." A number of interviews took place, and finally he made a proposal that if I would allow the brickwork to stand—the brickwork was excellent; it was only the packing that was questionable—he would accept payment for the packing, not as sandstone concrete, but as ordinary filling. The matter was submitted to the Minister, and was sent on one or two occasions to the Crown Solicitor. The whole thing was thoroughly gone into, and finally it was decided that for the whole of the packing that had been done the contractors were to be paid at the rate of 1s. per cubic yard, instead of at the price for sandstone concrete. That was carried out, and that, I think, was the circumstance to which Mr. Bagge refers. I ought, perhaps, to say that in my judgment—and it is not a recent judgment, but an opinion I have held for a long time—this concrete packing was unnecessary. Mr. Bagge, on the other hand, thought otherwise, and continued to specify it. When this matter occurred upon O'Neil and Rogers' contract, I wrote a minute upon the whole matter, and the Engineer-in-Chief approved that in future sand should be used for packing the brickwork over the arches in the tunnels instead of sandstone concrete. That is the history of the thing.

20135. Sand is specified in the departmental plan for Contract 77? Yes. The whole of the contracts from that time have been let with the specification for sand, and not sandstone concrete, packing in the case of tunnels.

20136. Except, I suppose, in exceptional cases where concrete may be ordered? In exceptional cases we retain the power to order concrete.

20137. Mr. Parkes.] What was the date upon which O'Neil and Rogers' contract was let? It was let at the same time as Contract 69. The two contracts were running continuously. O'Neil and Rogers' contract was finished a little before Contract 69, but the two contracts were working at the same time. I could not give you precise dates.

20138. The two contracts were started at the same period, both being upon the same specification as regards concrete? I think there would be similar specifications. I have not compared them in that respect, but it is probable that they would be similar, because they would be drafted at about the same time.

#### TUESDAY, 13 OCTOBER, 1896.

Edward Mann Clark sworn and examined:—

E. M. Clark. 20139. His Honor.] You are the representative of the Electoral District of St. Leonards in the Legislative Assembly? Yes.

13 Oct., 1896. 20140. You were the representative of the original Electorate of St. Leonards? Yes; and afterwards of Willoughby, and then again of St. Leonards.

20141. You took, I think, a great deal of interest in the improvement of North Shore generally, and especially in reference to the matter of sewerage? Yes; I have always taken an interest in any matter tending to the improvement of the district.

20142. You were asked, I suppose, by different persons, to see that the sewerage works were pushed on at a reasonable rate? I have always been more or less troubled at times by workmen. They always come to me in connection with any work in the district calculated to give them employment. They are always worrying me about that. They did worry me, I think, about one of the contracts which form the subject of this inquiry.

20143. As to Contract 79—the contract beginning at Mount-street and going down to the end of the sewer at Long Bay;—what do you know of that? I took a particular interest in that work municipally and otherwise—in fact, I have always taken an interest in the entire sewerage system. I am, even now, fighting for other sewerage works in the district.

20144. Do you remember Messrs. Bond and Hudson being the successful tenderers for a contract which hung fire for some time—the original 79? I know the contract. I was under the impression that Carter, Gummow, & Co., were the successful tenderers.

20145. You remember the fact that that work did hang fire for some considerable time? Yes.

20146. Do you remember writing to the department upon the question, suggesting that, as the work was urgent, the successful tenderers, whoever they were, ought to be compelled to take it up at once? I have a slight recommendation of a letter to that effect.

20147. The letter which appears upon page 270 of the Parliamentary return I hand you is the letter you wrote? Yes; that is my letter.

20148. You do not actually remember writing it, I suppose? No. I have so many letters of that kind to write, I do not remember writing this particular one; but it is apparently mine.

20149. You wrote again a fortnight afterwards, hurrying up the matter, as it were? Yes.

20150. You have a general recollection of writing some letters dealing with the question? Yes, in connection with that particular contract. At that time I was always writing to the department, because it was the beginning of the sewerage work in the district, and there was a general anxiety that it should be pushed on.

20151. At that time were you acquainted with Mr. Carter? I knew Mr. Carter, but I had never had any conversation with him on sewerage matters.

20152. Did you know him intimately? Not intimately; I knew him as an old resident of the district. I have never had any conversation with him at all. I knew that he was connected with the municipality in various matters, but I never had any conversation with him before writing the letters to which you have referred.

20153.



20153. Did you know him at that time to be a contractor? I could not say if I knew him to be a contractor at that time. I do not think I did. E. M. Clark.
20154. You know that his firm afterwards obtained the particular contract concerning which you wrote, and that they carried it out? Yes. 13 Oct., 1896.
20155. But, up to the time of his actually getting the contract and beginning the work, did you know that he was a tenderer for it or not? I did not know that he was a tenderer.
20156. At that time did he ever come to you and ask you in any way to further his interest in relation to that contract? No; he never came to me at all.
20157. All your action in relation to the pushing on of that work was in the interest of the district, and because workmen came to you asking you to get some work under weigh if possible? It was not only the workmen; but the residents of the district generally were anxious that the work should be proceeded with. It was really on these all-round representations that I urged that the work should be pushed on.
20158. You did not take action at the request of Mr. Carter or of any other person who saw you on his behalf? No.
20159. The work was then undertaken and went on? Yes.
20160. And then some time afterwards there was an extension—the work known as Contract 79A? Yes; but of course I do not know the contract by that number. I know the work to which you refer, I think.
20161. Do you remember anything about the early history of that extension? Yes; representations were made to me in a similar way as to that work, and one day I met Mr. Carter. I told him it had been represented to me that some of his men would be very shortly out of work if the extension were not carried out. I asked him whether he could go on with it—whether he would take it up if I could get the Secretary for Public Works to give the contract to him. He said he would be very glad to take it up, and then I interviewed the Secretary for Public Works, Mr. Lyne, in the matter. Mr. Lyne said that Carter, Gummow, & Co. had always been a very respectable firm of contractors, and that if the work could be carried out by them he saw no reason why they should not have the extension, provided they would carry it out at a price satisfactory to the department.
20162. It was you who first spoke to Mr. Carter, and not Mr. Carter who first spoke to you? I first mentioned the matter to him.
20163. He said he was willing to do the work? Yes.
20164. Did you afterwards interview Mr. Lyne with Mr. Carter on the subject? I had two or three interviews with Mr. Lyne on the subject, because the question of cost had to be considered. The cost on the schedule rates for the previous job would have been £16,400, but the department were not prepared to give that amount. The departmental estimate, I think, was £12,800, and Carter, Gummow, & Co. offered to carry out the work for £13,700. There was considerable parleying between the department and the firm as to whether the work should be taken up for £12,800 or not. Finally, it was taken up at that figure, I believe.
20165. And so you came to see Mr. Lyne on the subject? Yes; once or twice. I am not sure whether I did or did not see him once—I think I have a slight recollection of it, but it would only be for a minute or two—with Mr. Carter; but I should not like to swear that I did so. I have a slight recollection of having gone to him with Mr. Carter.
20166. Can you recollect what took place on the occasion when you and Mr. Carter saw the Minister together? There was a conversation of only a short duration between Mr. Lyne and Mr. Carter, I think, upon the question whether Carter, Gummow, & Co. should take up the work at the departmental estimate of £12,800. That was the whole of the conversation which took place, as far as I can remember.
20167. Mr. Lyne would not go over that amount? No; he insisted that if the work were carried out it must be carried out at the departmental estimate.
20168. And was Mr. Carter then doubtful as to whether he would come down to that estimate or not? I do not think that he agreed to it immediately—that is, while we were there; but shortly afterwards he did agree to carry out the work at the departmental estimate.
20169. And that was the last you had to do with that contract? Yes.
20170. During the time in which you were in any way dealing with either of these two contracts did you see Mr. Hickson? I think Mr. Hickson came into the room one day when I was speaking to Mr. Lyne on the subject.
20171. Was that as to the last contract? Yes; I never saw Mr. Hickson at all in connection with the former one. I think it was when the department were dealing with the last contract; and then he only came into the room to bring the papers in connection with the matter, so that Mr. Lyne might have them before him.
20172. Did he join in the conversation at all? I do not remember that. As far as my memory serves me, I think Mr. Hickson rather showed himself opposed to the letting of the contract to Carter, Gummow, & Co. in the manner in which it was proposed to let it. I have a slight recollection that that was the real gist of any conversation which may have taken place.
20173. Were you personally acquainted with Mr. Hickson? Yes; I knew him very well.
20174. So that you would have remembered the circumstance if there had been any conversation? I have so many of these things to think about, and so many conversations take place in reference to them, that it is very hard to remember any particular conversation. I am rather a busy man politically, and I often forget things of this kind.
20175. *Mr. Davis.*] Did you have any conversation, directly or indirectly, with any officer of the department with respect to Contracts 79 or 79A? I had no conversation at all with any officer of the department in regard to those contracts.
20176. The whole of the business, as far as you were concerned, was done by Mr. Lyne? Entirely with Mr. Lyne.
20177. *Mr. Andrews.*] You were both member for the district and Mayor of North Sydney at the time you made these representations to the department? Yes; I was returned to Parliament in June, 1891, and I see that one of the letters is dated in July. It shows that I was anxious, as the representative of the district, to get the work pushed on. I should like, if I may be permitted to do so, to supplement the evidence I have already given by a statement as to something which occurred in regard to the Monier system of construction. I remember having a conversation with Mr. Young and with Mr. Carter once in regard to that matter. It arose in this way: Mr. Carter came to me and said that he was anxious to send in an alternative tender upon  
the

E. M. Clark. the Monier system for a contract at Johnstone's Creek, the job upon which the Monier system has since been adopted. He said he would like to see the Minister to ask him not to declare his tender informal if he put in an alternative tender for the carrying out of the work upon the Monier system. I went with him to see Mr. Young. Mr. Young said he had no objection whatever to the firm's sending in an alternative tender, and that he did not see any reason why it should be declared informal, but that he would let the whole matter stand on its merits.

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20178. *His Honor.*] That was the only occasion upon which you saw the Minister on that subject? Yes.

20179. *Mr. Parkes.*] You also wrote to the Minister with the object of obtaining an extension of the Marrickville contract for Carter & Co.? Yes; I might say that at the time one of the works was gradually nearing completion. A large number of men who were working for Carter, Gummow, & Co. came to me with reference to the letting of further contracts. I may mention that I also, on behalf of the men, urged that certain work should be carried out by day-labour. There was at that time an agitation in favour of the butty-gang system. The men were anxious to have some of the work carried out upon that system, and I remember urging that some of the work should be carried out in that way.

20180. You wrote two or three letters about the Marrickville contract? Yes. (*Vide Appendix No. 79.*)

20181. *His Honor.*] Did Mr. Carter approach you on that subject? No; you can well understand that, the men having approached me with reference to the carrying out of the butty-gang system, Mr. Carter, as a contractor, being naturally opposed to the system, would not be likely to do so. I was really approached by the men. I suggested that as Carter & Co. were carrying out work of the kind, if this additional work could be carried out upon the same favourable terms, it might be the means of giving them employment.

20182. What was the particular work referred to? I think it was some extension of the Marrickville contract. I could not give you the particular number.

20183. Was the extension granted or not? It was not granted, I believe.

20184. I understand that you were in no way moved by the contractors in making the application in connection with that work? No.

20185. You were simply moved by the men themselves? Yes.

20186. They were afraid of getting out of work? Yes. I think that at the same time I asked a question in the House in regard to the carrying out of the work now being carried out by the Postal Department, the laying of the underground telephone wires. I asked the Postmaster-General to consider the advisableness of carrying out the work by day labour, and it was at my instance, I think—I mean partly in consequence of my question—that he carried out that work in the manner in which he is now doing it. That was done virtually on the representation of some of the very same men who were working for Carter, Gummow, & Co.

John William Townsend Boys sworn and examined:—

J. W. T.  
Boys.

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20187. *His Honor.*] You are an engineer? Yes.

20188. You have been and are still employed by the Department of Public Works? Yes.

20189. You were in charge of Contract 79, were you not? Yes.

20190. At its inception? Yes.

20191. In what capacity? As resident engineer.

20192. As sole resident engineer? Yes.

20193. Had you before then been upon Contract 72? Yes.

20194. At what time did you leave Contract 72? I am uncertain about the date.

20195. Did you come straight on to Contract 79? I am not quite sure.

20196. I want to know what you know as to the question of the transfer of any cement from Contract 72 to Contract 79;—as a matter of fact, did any cement go from one contract to the other? There were some small parcels which were sent to other contracts from Contract 72, of which there were records.

20197. Do you now remember, apart from the records, whether any of these parcels were actually sent to Contract 79? I cannot say.

20198. Do you remember when the cementing work first began upon Contract 79? I cannot say from memory.

20199. About how long would it be after the date of the commencement of the work? I cannot say positively, but I should think it would be about fifteen or sixteen months afterwards.

20200. After the beginning of the work? Yes.

20201. Would that time have elapsed before any cement went on to the work at all? No; there was cement there.

20202. You mean that that time would elapse before any cementing was done? Yes.

20203. How long had any cement been waiting there before the cementing work was begun? I could not say positively.

20204. Then you cannot say positively whether any cement did actually go from Contract 72 to Contract 79? No.

20205. You kept journals, I suppose? Yes; on both contracts. On looking at the journals I can find no record of any cement delivered from Contract 72 to Contract 79, although there are records of deliveries to sundry other contracts. Flood and Rutherford, for instance, had two or three parcels of cement from Contract 72.

20206. I believe that when Contract 72 was discontinued there was a large quantity of cement in stock upon the contract? I heard so. I did not actually see it. I did not go into that particular shed.

20207. In point of fact, considering that Contract 79 was started some considerable time after Contract 72 was discontinued, and that cement would not be wanted upon Contract 79 until all the excavation was done, would it not be very improbable that any cement would go to that contract from Contract 72? I do not think it would be improbable, supposing that the contractors had land upon Contract 79, and that they were paying a rental for land upon Contract 72.

20208. You think they might transfer the cement for the sake of storing it more cheaply on Contract 79? Yes.

20209. But you have no recollection of it? No.

20210. And you have no recollection of the arrival of the first cement which did come on to Contract 79? No.

20211. Do you remember a man named Burcombe, who was drawing for Carter & Co.? Yes; I recollect a man of that name.

20212.

20212. Have you had any recollection of his teams arriving on the site of Contract 79 with cement from anywhere? No. J. W. T. Boys.
20213. It would be a three-horse team if such a thing did occur;—do you think you would remember that? I scarcely think I should, because so many teams would be carting at the time. 13 Oct., 1896.
20214. You would not notice it even if the cement had come from a distance instead of from the wharf? I should not know any more of it had it come from a distance, than had it come from the wharf. It would come in the same direction.
20215. All that you would notice would be that a certain quantity of cement would arrive? Yes, speaking generally; but I should not notice particularly the number of teams, or anything like that.
20216. You worked upon Contract 72 and also upon Contract 79, and you would have an idea of the distance between the two contracts. I suppose it is about correct to say, is it not, that from the place of deposit of cement upon Contract 72 to the place of deposit of cement on Contract 79 the distance would be almost, if not quite,  $6\frac{1}{2}$  miles;—did you ever take the distance out? No; but it could be easily measured approximately on the map.
20217. The pace of travelling of a team with cement, I presume, would not be more than  $3\frac{1}{2}$  miles an hour at the most? I could not say.
20218. I suppose that the maximum would be  $3\frac{1}{2}$  miles an hour? I do not think they would go any faster.
20219. The teams travel, I suppose, between sunrise and sunset? That is according to the management; I could not say.
20220. The practice would be not to arrive on the ground with cement until well after 9 o'clock in the morning, I suppose, unless the cement had been brought from a very short distance? They might arrive at almost any time. Supposing, for instance, it were a moonlight night, and they were pressed, they might cart them.
20221. Do they cart at night on some occasions? I dare say they might. I have never seen them. I cannot say for certain.
20222. As to the work upon Contract 79, you made an estimate, I believe, at Mr. Davis' request in connection with the question of how the sewer could be constructed—as to the relative cost of different thicknesses of margin;—you remember that? Yes.
20223. That estimate is correct, I suppose? Yes; as correct as I could check it.
20224. At all events it is approximately correct? Yes.
20225. As to the overlapping of accounts in connection with the Bondi work, do you remember some charges which were incurred at Bondi being amalgamated with the accounts of Contract 79? I do remember some charges of that kind.
20226. Do you remember the circumstances? There were some tools charged, and some cement was also charged as far as I can recollect.
20227. How did that arise, do you remember? Yes; they required a little passed-cement, and the contractors on 79 were able to supply it.
20228. For some work at Bondi? Yes.
20229. Then how was it that the accounts were not kept separately—that the Bondi account was amalgamated with the account of Contract 79? Because the charges would all go into one big account. They would all go into the same account eventually.
20230. They were merely amalgamated for convenience sake? Yes.
20231. It made no difference, because the money would be paid eventually to Carter, Gummow, & Co. by the department in some form? Not necessarily. The amount might be paid to anyone else who did the work.
20232. But the work being done by Carter & Co., it would go into one account to which all sewer charges whether in connection with Carter & Co.'s contract, or any other contract of theirs, would be charged—is that so? Yes.
20233. Was this work at Bondi, do you remember, a sewerage matter or a road matter? A sewerage matter, I believe; but I cannot speak positively as to that.
20234. The amount would be paid by the same department ultimately in any case? Yes.
20235. You were continuously upon Contract 79, I understand? Yes.
20236. But you were relieved at one time by Mr. Weedon? Yes.
20237. Were you relieved by him more than once? I think I was relieved twice, but I could not say unless I looked at my diary. It was when I went on my holidays, in one case for three weeks, and in the other case for a month.
20238. Were you upon Contract 79A? Yes; I commenced it.
20239. Who took it over from you? Mr. Weedon.
20240. And he continued upon it? As long as it was in the charge of the department.
20241. A change was afterwards made, and Mr. Darley took over the construction, and then Mr. Weedon left? Yes.
20242. Do you remember reporting upon some complaints which were made about bad ventilation? Yes; upon Contract 79.
20243. What did you find to be the facts of the case? I found that the deep shafts, with the exception of No. 12, had fans driven by steam, and that in the comparatively shallow shafts they were intended to be driven by hand, but the hand-pumps had not been fixed at that time. The principal cause of complaint was at shaft No. 12. I see from my diary that I requested the contractors to have the hand-pumps applied at once.
20244. There was no engine to work the fan at shaft No. 12? No engine was ever put there.
20245. No engine was required there for other purposes? No.
20246. Was the hand-fan worked after that? Almost immediately.
20247. Had it not been supplied at all when the complaint was made? I do not think it was fixed. It was there on the ground.
20248. As far as you know, as a matter of practice, should it have been fixed by the contractors, or by the men themselves, the fan being supplied by the contractors? It is a mere matter of arrangement with the men. It is a contractor's matter, and not a matter for the department to interfere with, unless there were bad complaints.

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20249. When you did go into the question you insisted upon the fans being fixed by the contractors, I understand? Not necessarily. I insisted that it should be fixed.
20250. Who fixed it when it was fixed? That I cannot say.
20251. You cannot tell whether the men or contractors actually did it? No.
20252. Had the pipes been supplied? Not before then,
20253. They were not on the ground then? They were not fixed.
20254. Where were they? They were either in the yard or on the ground—I cannot say which.
20255. They were available, but they were not fixed—that is what you wish to say? Yes.
20256. So that, whether it was the duty of the men under the circumstances to fix the pipes and fan themselves, or whether it was the duty of the contractors, you cannot say;—it would depend, you say, upon what arrangement was made between them? Yes.
20257. And as to the working of the fans—how were they worked? The hand-fans were worked by the men.
20258. By the men themselves? Yes.
20259. That was the regular practice? Yes.
20260. When the fan for shaft No. 12 was supplied, where did it come from? That I cannot say.
20261. Had it to be got, or did it appear to be on the ground close by, where it could be secured in a short time? I cannot say whether this particular fan was in the possession of the contractors at the time, but fans can be procured at once if necessary.
20262. There was no delay in procuring this particular fan? No.
20263. *Mr. Davis.*] Speaking generally of the ventilation upon Contract 79, was it on the whole, speaking from your experience in sewerage works, such as has been generally provided by contractors? Yes; it was very fair throughout.
20264. Where the fans at the deep shafts are driven by engines there could be no question about the ventilation? It was excellent.
20265. In fact, it was a case of the men taking care lest they took cold? Well, it was pretty strong. It would blow a candle out very quickly if you did not guard it.
20266. Where you found that the ventilation was to some extent defective on the date of your report of 6th August, 1892, did you find any difficulty in getting it rectified? No difficulty at all when attention was drawn to it.
20267. You said in your report, "I have heard no complaints on the score of bad air from any of the men, with the exception of those at No. 12 shaft;"—do you remember writing that? Yes.
20268. Is that correct? Yes.
20269. And No. 12 shaft, at the time of your report, had been standing for how many days;—would it be ten days? I cannot speak from memory, but whatever I have written in my report would be correct.
20270. Do you know why it was stopped? There was a dispute about payment, I think, but I cannot say positively.
20271. Coming to the small quantity of material which was supplied upon Contract 79 for the Bondi work, do you know whether the Bondi work was carried out by me or by the Roads Branch? It was carried out by you.
20272. Do you happen to know whether it did or did not form a part of the Bondi Sewer scheme? I understand that it formed a part of the Bondi scheme, but what part I do not know.
20273. Whether the material was supplied from North Shore and Marrickville, or from any other source, so long as it was within the area which would eventually have to be administered by the Board of Water Supply and Sewerage, it would make no difference so far as the accounts were concerned? Not in the least.
20274. Do you happen to know whether the sewerage debt is dealt with separately or as a whole after the works are transferred to the Board of Water Supply and Sewerage? It is dealt with as a whole.
20275. So that, supposing the £11 ls. had been paid from the Vote taken for the sewerage works at North Shore and some of it had been expended at Bondi, that would in effect make no difference? Not the least.
20276. As to the transfer of cement from Contract 72 to 79, first of all I would like you to speak as to the position of things at the time the work was suspended upon Contract 72. I would like you to read the entry in your journal under date of 5th December, 1891, upon page 42. It is as follows—"Concreting outfall, plastering, &c. The contractor intends driving sheet-piling at face of outfall on Tuesday morning. The inspector finds that there are only 1,689 barrels in the three sheds, viz., 300 Alsen, 958 Camel, 431 Germania; total, 1,689. It was reported that there were 2,200 barrels;"—what would that entry refer to? It would refer to passed cement. The 1,689 barrels, I take it, would be passed cement in the three sheds.
20277. Will you look at page 42 of the journal again, and read the entry under date of 26th November? Yes.—"Alsen cement passed; concreting, filling in, and plastering."
- 20277½. The journal also states how much was passed on that day? Yes; there it a note in the margin, "300 Alsen."
20278. Does that 300 correspond with the entry made on 5th December? It is the same number.
20279. Does it confirm you in your opinion that the 1,689 casks of cement entered under date of 5th December were passed cement? Yes.
20280. In addition to that, have you any recollection of any other cement at about that time on Contract 72? Yes; there was some cement passed previous to that, and recorded.
20281. But have you any recollection of writing a minute, asking that some cement might be tested? I remember speaking about some other cement, and I declined to test it because it was more than we required on that contract.
20282. Do you remember writing this minute: "Messrs. Carter & Co. have informed me that they had stored 2,000 barrels of cement on the Munni-street to Shea's Creek contract, and require it to be tested. This quantity is in excess of the amount required to finish the present work, and I have refused to bring the sample?" Yes; I remember that.
20283. Does that minute refer to the same cement as the entry under date of 5th December in the journal? No.
20284. These 2,000 casks refer to cement which had not been tested, and which the contractors wanted to be tested? Yes.

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20285. When the work was suspended on Contract 72 you gave up control? Yes.
20286. Would you be likely to have any record of what occurred after you gave up control? No; I should not have any record at all. As soon as I leave the work I have nothing more to do with it.
20287. Can you give us any idea as to where the 2,000 casks of cement to which you have referred as being untested were stored. You refer in your entry in the journal, under date of 5th September, to three sheds containing the 1,689 casks;—where would the 2,000 casks be stored? I cannot say positively from memory, but I feel sure that it was right up at the top end, in Munni-street.
20288. In Knight's paddock? I forget the name of the paddock; there were four sheds altogether.
20289. Will you tell His Honor where they were? There was one down on the rising ground, near the swamp—that is, almost at the outfall of the concrete channel. Then there was one opposite the boiling-down place; another close to Mitchell Road; and a fourth up at Munni-street.
- 20289½. To the best of your belief the 2,000 casks would be stored at the upper end? I think so.
20290. Do you know what the practice has been with regard to the carting of cement backwards and forwards on these contracts;—will you tell His Honor briefly what has taken place from your own knowledge and experience? The inspector in charge of the work has orders, as the cement goes out, to brand it. He generally does so, and he takes a description of the maker, and the number of the cask, and forwards it to the inspector on the job to which the cement is going. The other inspector enters the receipt of such and such cement from such and such a contract.
20291. *His Honor.*] If cement has not been passed is anything of that kind done? We have nothing to do with that. If it is under test it is not allowed to go.
20292. If the cement had not been passed at all would the department take cognisance of any transfer of it? No.
20293. *Mr. Davis.*] Do you remember anything which occurred in connection with the packing of shaft No. 6 on Contract 79? I remember one of the inspectors complaining about some dry stone being put down, and an inquiry being made. We tried the shaft afterwards. I gave orders to my inspector to go and see whether such a thing had been done—whether the dry stone could be found in the work, and he could find nothing of the sort.
20294. Did that inspection take place before I came to look into the matter;—I suppose you remember my coming over? You came over at 9 or 10 in the morning after I had sent in a report on the matter.
20295. How long was it after I came before you had the work examined? I could not say.
20296. You are quite sure that you had it examined? Yes.
20297. And you are quite sure also that you found that it was all right? Yes.
20298. You have been resident officer upon Contracts 72, 79, and 79A, and on others? Yes, on Butcher's Contract, which was a sort of reticulation work on Holterman's Estate.
20299. Were you not resident engineer on the Neutral Bay and Careening Cove work? Yes; and on the storm-water work at Balmain, and Lemon and Spencer's Glebe sub-main contract.
20300. Many of these works were carried out by other contractors than Carter, Gummow, & Co.? Yes.
20301. Did you notice any difference in the practice in regard to the contracts of which you have just spoken as compared with the practice observed on the contracts of Carter, Gummow, & Co.? No, they were all on the same footing.
20302. Can you say, with regard to Contracts 79, 79A, and 72, whether, so far as your supervision goes, the proper quantity of cement, the specified quantity, was used? I should have to leave 79A out of my answer, as no concreting was done on that contract under me; but, as to the rest, the concreting was done in the usual way with the quantities specified.
20303. Did you ever find on either of these jobs that less cement than the quantity specified was being put into the work? No, I personally tested the work. I frequently tested it when I went over it. I tasted some of the concrete, and you could taste the cement strongly. The work set well, proving that there was plenty of cement in it. A week after the concrete had been put in you would find it so hard that you would have great trouble in picking it out.
20304. *His Honor.*] What sort of a man did you find Inspector Reid to be? He was what you would call a decent fellow, but he had a peculiar way—in fact his way was very unpleasant indeed. He always wanted the last word in any argument. He frequently raised arguments, and he invariably wanted the last word. He was very troublesome in that way, but I believe him to be a thoroughly honest man.
20305. But cantankerous? Yes.
20306. Did you find that he did not get along well with the men? Yes, I found them always at logger-heads over petty little things. I dare say there were faults on both sides, but Reid could not leave things alone, and he was always wanting, as I say, to have the last word in everything even with myself. I warned him several times that if he had any complaints to make he must make them straight out and say definitely what he wanted, and that if he could not do that, I should have to report him; but he continued his nagging and argument.
20307. Which was more irritating to the workmen, I suppose, than even sailors' language emphatically applied? A good deal, I think. I know that he used to irritate me a good deal with the very same mannerism.
20308. *Mr. Carter.*] Referring to Contracts 79 and 72, the work on those contracts, as far as you are aware, was always faithfully performed? Yes.
20309. Did you ever find the contractors reluctant or hesitant in carrying out anything you asked them to do;—supposing, for instance, a piece of work was not quite right, they would not hesitate to put it right if you asked them to do it? No; they carried it out at once if there were any complaints.
20310. Referring to the question of cement on Contract 72, you said that there were four sheds;—do you remember if there were any more than four? I cannot recollect any more at the time I was there.
20311. Do you remember one under the railway line? That was put there after I left the work. I saw it there.
20312. That would make five in all? Yes.
20313. The top shed, which, I may tell you, was in Knight's paddock, was a very large one? Yes.
20314. How many casks do you think it would hold—3,000 or 4,000? Speaking from memory, I should say you could stock there between 2,000 and 3,000.
20315. Do you remember our putting 40 feet on to that shed to take in cement which was not required for the contract? No; I seldom went round that way.

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20316. There were 1,689 casks of tested cement in the three sheds, and there were also 2,000 casks of untested cement, as I gather from your journal;—is that correct? I believe so.
20317. You would not take official notice of the 2,000 casks unless you were asked to test it? No.
20318. We could do as we liked with it? Yes.
20319. Referring to the carting of cement, one of our carters (Burcombe) has been here, and has told us that he made three trips a day between Shea's Creek and North Shore, taking, in company with other carters, the 2,000 casks of untested cement. I would ask you to say if you have ever seen cement being carted through North Shore at 9 or 10 o'clock at night? Never.
20320. Have you not, when you have been going to the theatre at night, noticed brick carts going up and down the Milson's Point Road? I have not noticed them.
20321. Do you not know that carters start at 4 o'clock in the morning and leave off when they can? I know that.
20322. And that a carter's hours of labour are not eight, but are often sixteen to eighteen? Yes.
20323. So that it would not be out of the way to make three trips a day from Shea's Creek to North Sydney? No; they could do it, I should say.
20324. *His Honor.*] Do you think they could cover 39 miles a day with a dray, loaded one way and unloaded the other? They do it with timber in the country, and I do not see why the teams here should not do it. I know the timber teams do it in the country, having from 1 to 2 tons to carry.
20325. Of course, the time necessary for feeding, loading, and unloading, would have to be taken into consideration? Yes; I have known them to start at 3'30 or 4 o'clock in the morning and to get home after their last load at 10 o'clock at night.
20326. Using the same team or two teams of horses? I cannot say, but I think the same team. I know that they have got so covered with dust that one could scarcely recognise them again.
20327. *Mr. Carter.*] You know our manager, John Reid? Yes.
20328. Did you ever find him averse in any way to carrying out your orders? He was not averse to carrying out my orders.
20329. But he might possibly object to Inspector Reid's orders? Yes; he objected to orders direct from the inspectors. He wanted his orders from me.
20330. *Mr. Parkes.*] The journals produced would set forth the dates upon which you left Contract 72, and entered upon Contract 79? The journal of 72 will show when I left that contract, and the journal of 79 will show when I began there. I may say that I had an assistant at the time.
20331. Who was the assistant? *Mr. O'Hanlon.* He was on 79 for a couple of days or so, helping me to start the shafts.
20332. The note which appears upon page 48 of the journal of Contract 72 would be your final note in that journal? Yes; that would be the last of my writing in the journal.
20333. What is the date of that? 26th February, 1892.
20334. The journal of 79, starting upon page 2, would be in O'Hanlon's writing, would it not? Yes.
20335. Would that be the date upon which you took charge? Practically it would. I probably sent him there a day or two in advance. I may not have gone on to the ground for several days after that. He would be sent there to get ready.
20336. What is the date of the first entry? 14th March, 1892.
20337. That will fix the date of your leaving Contract 72 and going on to Contract 79, will it not? I might have had some other work coming in between. It would not mean that these were the only contracts that I went on to.
20338. But it would fix the dates of your having a knowledge of the one or the other? Yes.
20339. I would like you to read again your entry on page 42 of the journal of Contract 72, and also the entry which appears upon page 41, under date of 16th November? The entry under date, 16th November, is as follows:—"Filling in at back of timbers, plastering, &c. The contractors have stored on the works 2,000 barrels of cement samples, which they desire to have tested. The cement is not required. Awaiting instructions from Mr. Davis." There is a marginal note, "Referred to Engineer-in-Chief.—J.D."
- 20339½. After that there was very little work to complete upon the job? Not much.
20340. How many barrels of cement will it take to complete it? It would be impossible to say.
20341. Would it take more than 200? I should fancy so. There was a lot of plastering to be done at the outfall.
20342. How many barrels would you think would be required? I could not hazard a guess.
20343. Would it take 1,000 barrels? I could not say.
20344. Would it take 800? I could not make a guess, because I really forget whether the jack-arching was rendered, or whether the lower part of the sewer was rendered. I know that there was some work left to the last.
20345. Was there a fair amount of work to be done in cement? A fair amount of work.
20346. Will you now read again the entry under date of 5th December, on page 42? Yes; "concreting outfall, plastering, &c. The contractor intends driving sheet piling at face of outfall on Tuesday morning. The inspector finds that there are only 1,689 barrels in the three sheds, viz., 300 Alsen, 958 Camel, 431 Germania—1,689, total. It was reported that there were 2,200 barrels."
20347. Did that not refer to the report which you formerly read? No; it is evidently in connection with a conversation I had had with the contractors. They had 2,000 barrels which they wanted tested, and the 1,689 barrels were tested cement.
20348. But your entry says, "It was reported that there were 2,200 barrels?" That would probably be in conversation. The information that the contractors had stored the 2,000 barrels referred to in my entry of 16th November would come from my inspector. The information as to the 2,200 barrels would come from the contractors.
20349. *His Honor.*] I understand you to say that the 2,000 barrels was an assertion made in relation to untested cement? It had nothing to do with tested cement. It had to do with untested cement, and I had nothing to do with that.
20350. *Mr. Parkes.*] Does the entry on 16th November refer to the cement mentioned in your minute? I think I have muddled up the two things. I really cannot say positively what the 2,200 barrels in my entry of 5th December referred to. I cannot exactly remember the conversation, but I remember that there

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there was untested cement and tested cement. I remember also that there were four sheds. I mentioned in my entry of 5th December that those sheds contained tested cement, and the untested cement must have been in the fourth shed.

20351. But the three sheds would be on the work, whereas the fourth shed would be off the work, in Knight's paddock? No; they were all on the length of the contract. The contract was to be stopped at a certain point if the Engineer-in-Chief should so decide, but we should take the paddock to which you refer as being included in the contract.

20352. But you say you never entered the fourth shed to see what was in it? No; I did not bother about it.

20353. Will you read out the names of the passed cement referred to in your entry of 5th December? Alsen, Camel, and Germania.

20354. If in Henry Austen's return of cement under date of 6th November there is an entry of 300 barrels of Alsen's cement delivered on to this contract, that would represent the barrels to which you have just referred, would it not? I have no record of that.

20355. This information is taken from the merchants' books; it shows also that on 13th November Parbury, Henty, & Co. delivered 1,000 barrels of Camel cement;—that would also be the 958 barrels, would it not? I cannot say.

20356. Alsen's cement was tested on 11th November, 1891;—you have a record in your book of that, have you not? No; there is no record here.

20357. But if there is a certificate in the office book showing that it was tested on 11th November, that would be correct? Yes; but I have not entered it here.

20358. As to Parbury Henty's delivery of the 1,000 barrels of Camel, that would agree with your entry, would it not? I cannot say. I have no record here.

20359. What is the number of barrels of Camel cement in your entry? 958.

20360. What is the date of it? 5th December.

20361. Then if under date of 6th November there is in Parbury, Henty, & Co.'s books an entry of 1,000 casks of Camel cement, that is likely to be the same, is it not? It might, or it might not be. I could not say.

20362. On 13th November, Henry Austin delivered 407 barrels of Germania, so that you will see the three entries of Alsen, Camel, and Germania, seem to tally with your entries? They do not.

20363. But approximately? Yes.

20364. If the records of the department show that the 1,000 barrels of Camel cement were not tested, and that the 430 barrels of Germania were not tested, your note would be wrong? Not necessarily. Do you mean to say that no other cement had been sent to the contract before that?

20365. I have a complete record of the cement deliveries to the contract, taken from the merchants' books; and there are no deliveries entered in those books other than the three to which I have referred. Therefore, the entries would be likely to correspond with the entries in your journal? I do not think they do.

20366. But the figures are approximately the same? Approximately.

20367. Is it not possible that your inspector may have counted them wrongly? That is on the cards, of course.

20368. Then we have the fact that, according to the books of the department, neither the Camel nor the Germania was tested? I think the Germania was tested. I have an entry under date of 17th September, that 150 barrels of Germania had passed.

20368½. But you must give us dates after November to be relevant;—can you give us any explanation? I cannot, except that the cements mentioned in my entry on 5th December are tested cements. The only explanation I can offer is that the cements there referred to had been previously tested.

20369. Will you please turn to page 50 of your journal;—you will there see Inspector Inwood's remark as to the Camel cement? I see that, under date of 23rd April, there is in this entry, "Inspector Inwood took fourteen samples of the Camel brand cement for setting tests."

20370. That would be after the second portion of Contract 72 had been started? That would be in Mr. Weedon's time.

20371. But after the second portion of the contract had been started? I believe it would be.

20372. Was any cement delivered on to the job after you had made the entry which you have read? Not that I know of.

20373. You never saw any delivered? No; I should have left the work. I should not have seen it.

20374. Refer now to page 32 of the journal of Contract 79;—you will see there, I think, the first entry of cement delivered on to that contract? There is this entry, "900 barrels Wouldham cement passed, Red Cross brand."

20375. Would not that be the first cement which came on to the contract? That I could not say.

20376. Will you look through the journal? There is an entry on 14th September, 1892.

20377. Of how many casks? It does not say. It simply says, "Cement delivered, Red Cross Wouldham."

20378. That is the first cement you would have a note of on the contract? Yes.

20379. Will you now turn to page 70 of the journal of contract 79;—you will see there an entry under date of May 15th, 1893? Yes; it is as follows: "Only one shift working at 12; three shifts working in Nos. 1, 3, and 4; Nos. 5, 6, 7, and 11, working two shifts; scabbling at Nos. 3 and 10. Cement carted and transferred to Contract 90, Neutral Bay, 10 barrels, making a total of 130 barrels, 99 of which were not advanced on by the department. The rest have been forwarded by consent."

20379½. That would leave the 900 barrels referred to in your note? That I cannot say. I have a notion that it is some other cement.

20380. If Parbury, Henty, & Co., on September 21st and 24th, delivered 999 casks to North Shore of Wouldham cement, the same brand, that would be identical, would it not? It does not say so.

20381. But you have a note on 20th October of 900 barrels of Wouldham? Yes.

20382. Would not the 999 barrels delivered on 21st September and 24th be identical, then, with that? That I could not say.

20383. But it would probably be so, seeing that the brand is the same? It probably would.

20384. Upon Contract 72 the brands were Alsen, Camel, and Germania? Yes.

20385. But in this case the brand is Wouldham? Yes.



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20386. Can you tell the Commission at what time the horse-ferry at North Shore ceases running? I could not.
20387. If cement were stored upon Contract 72, and were untested when it came to Contract 79, you would have it tested? I should have all the cement on 79, of which I knew nothing tested.
20388. Unless you had a certificate of test coming with the cement? Yes; I might get verbal notice, of course.
20389. But you would have it tested if it were untested? Yes.
20390. Do you recollect at the period of the suspension, before you left Contract 72, any of the 2,000 casks of untested cement going away to Carter, Gummow, & Co.'s jobs? I do not recollect any cement going away at that time. I probably should not see it, because just about that time I should be in the office making up the final voucher.
20391. If cement were going away would not the inspector report it to you? He would inform me.
20392. But he did not do so? Not that I can remember.
20393. If you refer to page 44 of the journal of Contract 72 you will see, under date of 21st December, 1891, this entry: "72 barrels of Germania and Alsen brands for Iron Cove storm-water left to-day; total, 198 barrels; and 9 barrels Germania for Carter & Co.'s Glebe contract"? Yes.
20394. That would be 207 casks leaving the work at that time? Yes.
20395. You have given evidence that Flood and Rutherford had cement from the contract;—do you know of any other contractors who had any? I cannot recollect any. They might have had a few barrels. One would not think anything of a man coming down and taking a dray-load. Of course, the inspector would make a note of it.
20396. The practice is to make an advance upon the cement stored on these contracts, is it not? Yes, if it is asked for. I do not do it upon my own hook, as it were, but if I have authority I make the advance.
20397. If you turn to certificate No. 13 of Contract 79, you will see an advance upon 900 barrels of cement at 16s.? Yes; that would be in April, 1893.
20398. The certificate I hand you is your certificate? Yes.
20399. What is the number? It is the fifteenth progress return.
20400. On how many barrels of cement have you advanced on that certificate? On 870.
20401. Prior to September, 1892, did any of your inspectors report to you that Burcombe was fetching cement to Contract 79 from Contract 72? I cannot say positively. They might have done so, or they might not.
20402. Have you any recollection of it? No.
20403. *Mr. Davis.*] Some cement was delivered to Contract 90 from Contract 79; do you know whether it was returned to Messrs. Carter & Co;—was it a loan or was it sold? That I cannot say positively.
20404. You do not know whether it was returned or not? No.
20405. *His Honor.*] Whose contract was No. 90? W. W. Johnstone's.
20406. Is the journal supposed to show the arrival of cement on the ground or not? It is supposed to be shown, but I am sorry to say I have slipped one or two entries which I ought to have made. Therefore, the journal is not perfect.
20407. *Mr. Parkes.*] But I suppose that Inspector Fowle's record of cement, if it agrees with your journal, will be correct, supposing he counted the barrels? If he counted them.
20408. He would have close inspection of the cement, would he not? Yes.
20409. *Mr. Davis.*] Supposing Inspector Fowle did not speak as to any cement before September;—then he would not have anything to say as to what seems to be an element of doubt in your mind? No.
20410. *His Honor.*] The books do not indicate any removal of cement from Contract 72 to Contract 79? No; there is no indication.
20411. *Mr. Davis.*] Will you look at the journal of 72 and tell His Honor precisely what the 2,000 casks in the entry of 16th November refer to? That entry refers to some cement which I refused to have tested, and which I did not see at all. It is described as 2,000 barrels.
20412. How did you know that there were 2,000 barrels? Probably the inspector would say verbally that there were 2,000 barrels.
20413. What you say is, that although you did not see the 2,000 barrels, it was reported to you that they were there? Of course, I should not have anything to do with it under the circumstances.
20414. *His Honor.*] It being untested cement? Quite so.
20415. *Mr. Davis.*] To what does your entry under date of 5th December refer? I believe that 1,689 barrels refers to tested cement.
20416. *His Honor.*] That is where the 2,200 barrels are mentioned? Yes.
20417. I understand that that 2,200 is, as far as you can see, intended to apply to tested cement? Yes.
20418. Which was found to consist of only 1,689 barrels? Yes.
20419. Had that 1,689 barrels which had been put down at 2,200 barrels anything whatever to do with the 2,000 casks referred to in your entry of 16th November? No, I am pretty sure it has not; but I really cannot swear to it. The entries are not complete enough to enable me to be positive upon the point.
20420. *Mr. Davis.*] The thing happened a long time ago, and it is difficult to remember precisely what did take place; but as the matter is one which I should like to have cleared up, I will ask you whether you could go so far as to say that it is improbable that the 2,000 casks referred to in your entry of 16th November are the same casks as those referred to in your entry of 5th December? I cannot say that it is improbable, but I do not think they are; I cannot recollect.
20421. Supposing Mr. Christie has correctly given the evidence which appears upon page 587, and that on 6th November Henry Austin delivered 300 barrels of Alsen's cement; that on 13th November Parbury, Henty, & Co. delivered 1,000 barrels of Camel cement; and that on 13th November Henry Austin delivered 407 barrels of Germania,—would it have been possible, between 13th November and 5th December, to send in samples and get the cement passed? That would be twenty days. It would be possible to get the cement tested in that time if it were sent in at once.
20422. Is it not customary to pass cement upon a twenty-eight days test? It is customary.
20423. And if that custom were followed in this instance there would not have been time to get the cement passed? No.

20424. *Mr. Parkes.*] Then how is it that on November 6th 300 barrels of Alsen's cement were delivered and were passed on November 11th, five days afterwards? The entry does not say that Alsen's cement was tested. It says the contractors were storing.

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20425. Is there not a record in that note of the cement having been sent in for test? No.

20426. At all events the certificate bears date of November 11th, and the cement was delivered on November 6th. That would show that there would be plenty of time for testing if there were an interval of 20 days? That may be.

20427. Will you indicate upon a plan the position of the sheds in which the cement was stored? Yes.

20428. On November 10th there is an entry of Alsen's cement having been passed, is there not, in the journal of Contract 72? No. On November 26th you will find an entry "Alsen's cement passed," and in the margin it says "300, Alsen."

Joseph Davis recalled and further examined:—

20429. *His Honor.*] Can you speak definitely and of your own knowledge as to the position of the cement sheds upon Contract 72? I know from my personal knowledge and from visiting the works two or three times a week that there were four sheds upon the contract, and that, in addition to that, the contractors stored cement, not a very large quantity perhaps, under one of the arches of the Illawarra railway where it passed Macdonald-street. The sheds were as indicated by Mr. Boys, one near the outfall of the concrete channel, a second below Mitchell Road, a third above Mitchell Road, and a fourth in what is called Knight's paddock, at the top of Macdonald-street.

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20430. Of what size was the shed at Knight's paddock? It was a very large one.

20431. Capable of holding how many casks? I should say 2,000. I did not measure the shed, but it was a large one. I know that the shed was erected for the accommodation of the cement which was refused to be tested.

20432. Before the refusal to test, I suppose? Yes.

20433. The cement which was intended to be used upon the upper part of the work? Yes. The shed was intended for cement for the work along Macdonald-street and up to Munni-street, in anticipation that that work would go on. It was thought that it would be convenient to the site of the works.

20434. I should like you to refer to the voucher for Contract 69, which appears upon page 133 of the Parliamentary return;—does that voucher differ from the final voucher? I do not think it differs materially.

20435. There are some discrepancies which I find it difficult to understand. Look, for instance, at the item of timber. The estimated quantity of timber is 9,000 cubic feet, and the actual quantity is 9,818? Something like that.

20436. Then the quantity of excavation in ground requiring timbering is enormously in excess of the estimated quantity, and what I fail to understand—I do not know what the explanation of it is—is how it comes about that 9,000 feet of timber was estimated for what appeared to be such a very small amount of excavation requiring timber. The amount of excavation, it actually turned out, required approximately 9,800 feet of timber;—can you explain that? To begin with, the quantity of timber given is highly problematical. It is impossible to say whether timber will be required to be left in the open cutting or not. A percentage of the 9,000 cubic feet would be allowed for the open cutting, and as a matter of fact there was no timber left in.

20437. It was anticipated that a good deal of timber would be left in the open cutting? We have to provide for an emergency of that kind. In this particular instance I know that no timber was left in the open cutting, so that it all went to supplement the timber provided in the schedule for the tunnel, and in that way, when the quantity of timber was ultimately worked out, it did not exceed the quantity provided in the schedule to any material extent.

20438. In the tunnel excavation the estimated quantity was 9,780 cubic yards, the actual total being 13,294 cubic yards; that is a very large increase. It was not due to any further work which was done, but was due to the fact that a great deal of the country which was excavated required timbering, the excavation being larger than was anticipated in the original schedule? That is the explanation, your Honor. The reason that the timber was not proportionately increased was simply due to the fact which I have mentioned, that in the probable quantities included in the schedule there would be a proportion of the 9,000 cubic feet for open cutting. That was not used. Therefore, it went to the credit of the tunnel.

20439. The excavation in open trench in the schedule is estimated to come out at the total of 22,815 cubic yards. In the 16th progress return the total given is 18,888 cubic yards;—that puzzles me very much? The explanation of it is this: that probably more of the ground than was anticipated did not require timbering. In the ground which requires timbering it is provided in the specification for trenches to be 6 inches wider than if there is no timber required, and the excavation has to be paid for to the outside of the timbering, so that it was not that there was any less sewer put in. It was simply that the ground proved to be harder than was anticipated, and, therefore, the trench would not be so wide. To the best of my recollection, that is what occurred.

20440. I find the following clause in the specification of Contract 72: does not this clearly provide for the construction of the open channel:—

If the 13 or 27 chains of the outlet end of proposed storm-water sewer (as provided in clause 3) should not be excised from present contract, then, pending the completion of proposed ship-canal to its junction with proposed storm-water sewer, an open channel, when ordered, to be excavated to such gradients, depths, and cross sections, from the junction of the two channels to the present head of said ship-canal, a distance of about 32 chains, as shown on drawing No. 1, and as shall be determined at the time.

? Yes, your Honor, I knew that the clause was somewhere in the contract, but I could not find it at the time. One cannot remember all these things.

FRIDAY,

FRIDAY, 16 OCTOBER, 1896.

George Christie recalled and further examined :—

- G. Christie. 20441. *Mr. Parkes.*] Since you made your last researches as to the quantity of cement used upon Contracts 79, 79A, and 69, you have perused an additional journal, relating to Contract 72, which throws some light upon the subject? Yes.
- 16 Oct., 1896. 20442. You have searched that journal for certain minutes? Yes.
20443. And from the journals of Contracts 72 and 79 you have compiled a statement of facts—that is, the facts contained in the journals? Yes.
20444. The statement which you will put before the Commission this morning is drawn from what? It is drawn from the departmental records of papers, the contract journals, the records of the traders' accounts, books, and invoices, and from the contractors' bank pass-books.
20445. And have you taken into consideration the daily returns of the inspectors? Yes.
20446. Which Mr. Davis said were correct within 5 per cent? Yes.
20447. In fact, the whole of your data are drawn from official documents ;—is not that so? From official and other documents.
20448. Is anything assumed in your report? No.
20449. *His Honor.*] I understand that it is a tabulated statement of what you have found in the various documents and books to which you have referred? Yes.
20450. *Mr. Parkes.*] I will ask you to read the memorandum? It is as follows :—
- MEMO. No. 21, *re* the shortage of cement on Contracts 79, 79A, and 69, compiled from the departmental records, the contractors' bank pass-books, traders' invoices, departmental tests of cement, &c.

As to the stock of cement on Contract 72 on 5th December, 1891.

- (a) In the journal of this contract, at page 42, under date 5th December, 1891, Resident-Engineer Boys has the following minute :—

“The inspector finds that there are only 1,689 barrels in the three sheds, namely :—

|     |            |
|-----|------------|
| 300 | “Alsen's”  |
| 958 | “Camel”    |
| 431 | “Germania” |

1,689 Total.

It was reported that there were 2,200 barrels.”

- (b) These parcels of cement correspond with the three last deliveries of cement prior to the stoppage of the work (*see* page 587 of the printed evidence).
- (c) That the 300 casks “Alsen's” cement *had been tested* is shown by certificate No. 609, which was registered on 19th November, 1891. The “Camel” and “Germania” cement *were untested* at date of Mr. Boys' minute of 5th December, 1891, as above, but were tested subsequently, as per certificates Nos. 670 (18th March, 1892), 700 “Camel,” and 668 (16th March, 1892), 360 “Germania.”
- (d) In the Contract Journal on 11th November, 1891, Mr. Boys made the following entry, “Contractors are storing 2,000 barrels of cement in sheds on the work.” It was at this date that the above-mentioned 1,000 casks “Camel” and 407 casks “Germania” cement were in course of delivery, as shown by the invoices furnished as Appendix.
- (e) A further reference is made to these deliveries of cement in an entry by Mr. Boys on 16th November, 1891, as follows :—The contractors have stored on the works 2,000 barrels cement, samples of which they desire to have tested. The cement is not required. Awaiting instructions from Mr. Davis.”
- (f) Subsequently—*viz.*, on the 5th December, 1891—Mr. Boys wrote the minute on this matter which appears at the beginning of this memo., setting forth a stock of 1,689 casks cement, consisting of “Alsen's,” “Camel,” and “Germania” brands.
- (g) From the 5th December, 1891, cement was (as shown by the official progress payments) used on the progress and completion of the first section of the contract, and 207 casks were transferred to Iron Cove and Glebe contracts. On 15th February, 1892, Messrs. Carter & Co., in their claim, charge for the value of 1,300 casks in stock.

As to resales and transfers of cement from Contract No. 72, &amp;c., from November, 1891, to 15th February, 1892.

- (a) *Resales* :—
- |  |            |
|--|------------|
| To Flood and Rutherford .....  | 800 casks. |
| (Paid by cheque, £467 6s., 16th November, 1891).   |            |
| To Danaher, Taylor, and Britton .....  | 600 casks. |
| ( <i>See</i> Mr. J. Carter's evidence, page 211 ; and payments, 22 February, 1892, £292 5s. 2d. ; and 7th March, 1892, £8 4s. 7d.) |            |

*Transfers* :—

|                         |            |
|-------------------------|------------|
| To Ironcove Creek ..... | 198        |
| Glebe .....             | 9          |
|                         | 207 casks. |

(*See* entry in Contract Journal, page 44, 21 December, 1891.)

1,607 casks.

- (b) Messrs. Carter & Co., in their claim of 15th February, 1892, charge for loss on resale of 2,000 casks, not for cement stored on the contract.

As to the first deliveries of cement on Contract 79.

- (a) The first deliveries of cement to this contract were as follows :—

|                            |                       |
|----------------------------|-----------------------|
| 21st September, 1892 ..... | 50 casks, “Wouldham.” |
| 24th September, 1892 ..... | 699 “ ”               |
| 21st September, 1892 ..... | 250 “ ”               |

Making a total of 999 casks of “Wouldham” brand cement. And until 30th June, 1893, this was all the cement delivered on this contract, as shown by invoices in Appendix.

- (b) The first test of cement for this contract was on 11th October, 1892, No. 779, of 900 casks “Wouldham” cement (*see* schedule of Mr. Roberts's tests in Appendix).
- (c) On 15th May, 1893, Resident-Engineer Boys wrote the following minute in the Contract Journal—“Cement carted and transferred to Contract 90, Neutral Bay, 10 barrels—making a total of 130 barrels—99 of which were not advanced on by the department, the rest having been removed by consent.”
- (d) The first advance on cement was made in Progress Certificate No. 13, 27th April, 1893, on 900 casks. This advance was continued on Progress Certificate No. 14. But in Progress Certificate No. 15, 27th June, 1893, the quantity advanced on was reduced to 870 casks consequent upon the removal of the thirty-one casks (the balance of the 130 referred to in Mr. Boys's minute quoted above).
- (e) The first progress certificate in which there is payment shown for any work requiring the use of cement is No. 15, of 27th June, 1893; and Inspector Fowle was, during the period covered by that certificate, appointed as inspector over that class of work. (f)

(f) When Inspector Fowle entered on his duties, he, on 15th June, 1893, as per his evidence (questions 16376 and G. Christie. 16509), took stock of the cement then on the contract, and found a total of 853 casks.

(g) This 853 casks exactly tallies with the deliveries to date, less removals and quantity used, as follows:—

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|                                       |                     |
|---------------------------------------|---------------------|
| Total deliveries .....                | 999 casks Wouldham. |
| Deduct—                               |                     |
| Removals to Contract 90 .....         | 130                 |
| Used as per inspector's reports ..... | 16                  |
|                                       | — 146               |

Balance ..... 853 in stock.

(h) The further deliveries of cement to this contract appear in the invoices in Appendix.

The total of 853 casks, which you have just mentioned, tallies with the note made by Inspector Fowle in his note-book? Yes.

20451. Will you read the two items of the claim made in respect of the cement upon Contract 72 at the time of the suspension of the contract? In the claim of the contractors, dated 15th February, 1892, there occur these items:—"Portland cement (1,300 casks, at 14s. 9d.), £958 19s.; Portland cement (loss on sale of 2,000 casks, at 2s. 6d.), £250."

20452. Will you refer to the three minutes read by Mr. Boys the other day in the journal of Contract 72? I presume you refer to the minute of 11th November, 1891, of the 6th November, 1891, and on the 5th December, 1891. They refer to cement then being delivered on the contract, or which had recently been delivered there as set out in the first part of my memorandum of this date.

20453. Do the records of tests throw any light upon the question of the 2,000 barrels of cement, which were supposed to be stored upon the contract, and which are referred to in one of Mr. Boys' minutes? Yes; it is stated in the journal that there were 1,689 casks of which 300 casks had been tested. The tested would be Alsen. The Camel and Germania were not tested until March, just prior to the commencement of the contract.

20454. Is that denoted in any official records? In the records of cement tests.

20455. Therefore, it would seem that of the 1,689 casks referred to in Mr. Boys' third minute all but 300 casks were then untested cement? Yes.

20456. According to the test-book kept by Mr. Roberts for the department, all Carter & Co.'s cements seem to have been tested upon this work, do they not? Yes.

20457. Coming to the progress vouchers of Contract 79, upon which an advance on cement appears. There is an advance upon cement in progress voucher No. 14, 900 casks; and in No. 15 that 900 casks is reduced to 870 casks;—is that not so? Yes.

20458. Does that not indicate that 900 casks alone could be the cement in stock? Yes.

20459. Is there any evidence contained in any of the books you have looked up of an advance upon 2,000 casks? No.

20460. Is there any evidence at all to indicate that 2,000 casks, in addition to the 999 casks which were delivered on that contract, were there? There is evidence to the contrary.

20461. What is it? There is the direct evidence of the delivery, and there is the direct evidence of Inspector Fowle counting the cement. There is the further fact that the advance was reduced from 900 to 870 casks, because 30 were transferred.

20462. *His Honor.*] There was nothing more apparently to fall back upon, you say? No.

20463. *Mr. Davis.*] In reference to Contract 72 you have said that the 2,000 casks which have been referred to were not stored upon that contract;—will you tell me upon what ground you make that statement? On the ground set forth in my memorandum.

20464. In paragraph (b) under the heading of "resales and transfers" you say "Messrs. Carter & Co. in their claim 15th February, 1892, charge for loss on resale of 2,000 casks—not for cement stored on the contract";—will you point out where in their claim you find that the contractors state that the cement is not stored upon the contract? They simply claim for 1,300 casks on the ground, and not for 2,000 casks additional to their stock.

20465. Am I to understand, then, that you make the statement that the 2,000 casks of cement were not stored upon the contract, apart altogether from the claim of Carter & Co.? I do, and I make it from the fact of the sales and transfers of cement, and from the fact that from the work on the contract, and from the cement delivered to it, they could not have had that quantity there.

20466. Will you tell us, first of all, what there is in that claim as put forward by Carter & Co. to lead you to the conclusion that this cement was not stored upon the work, taking the claim by itself? I take it that, if Carter & Co. claimed for the full value of certain cement upon the job, they had that cement there, or something to represent the quantity—that is, as to the 1,300 casks. As to the second item, the loss on the resale of the 2,000, they had not that cement on the job, but they made that loss upon it. They say, for instance, "Loss on resale."

20467. That is the inference you draw? Yes.

20468. You would not draw this inference—that the fact that 1,300 casks had been approved and accepted by the department was a sufficient reason for the firm claiming the full value of the cement; and that, inasmuch as the department refused to test the 2,000 casks represented to be stored upon the ground, that the contractors would, therefore, have no such claim in respect of that; the consequence being that they put in a nominal claim of 2s. 6d. a cask? Your question is rather a long one, and is difficult, on that account, to answer. You are assuming that the 1,300 casks were tested. I say that it was not tested cement; so that that destroys your question altogether.

20469. Do you say that the 1,300 casks were not tested? A small portion of the balance of Alsen's may have been tested, but very little of the total was tested cement.

20470. On what ground do you say it was not tested? Because all but the two last deliveries of cement were untested, and those deliveries agree exactly with what Mr. Boys states to be the stock included in the 1,689 casks. He says it was tested cement, but it is clear that it was not.

20471. I suppose you have been through the cement test-book, No. 2, have you? Yes.

20471½. Do you recollect test 609? Yes; it is referred to in my evidence.

20472. I think you have said that that 300 casks of Alsen's cement correspond with 300 casks of cement named in Mr. Boy's entry? Yes.

20473. Did you notice test 595, which mentions 390 casks of Germania for Contract No. 72? Yes; that is the delivery of 376 casks from Austin, on 8th October. It was tested on 14th October.

20474.

- G. Christie. 20474. Have you any proof whatever that that 390 casks did not form part of the 1,300? Yes; because it was not delivered until a month after that test.
- 16 Oct., 1896. 20475. But you assume what is perhaps not quite correct;—you say that the 1,300 casks were all delivered after the 11th November, 1891;—I ask you again are you sure that the 390 casks were not part of the 1,300 casks? Yes.
20476. Were you on the ground on the 11th November, 1891, and do you know from your own knowledge that there was no cement on the ground at that time? I was not on the ground.
20477. Did you notice the test 584, of 6th October, 1891? Yes.
20478. How many casks is it? 597.
20479. What brand is it? Camel.
20480. Does that brand correspond with the cement set down as being on the ground in Mr. Boy's journal on the 5th December? No.
20481. But it is the same brand, is it not? It is the same brand.
20482. Is test 595 of Germania also the same brand as some of the cement referred to in Mr. Boys' minute? Certainly.
20483. As to the 500 casks of "Camel," have you any proof that that 500 casks did not form part of the 1,300 casks mentioned in Carter & Co.'s claim? I have this proof—that cement was required to continue the work.
20484. But I ask you whether you have any proof that the 500 casks of cement, Camel brand, which was tested on the 6th October, did not form part of the 1,300 casks claimed for by Carter & Co.? I would say that it is sufficient proof that cement would be required to carry on the work.
20485. Were you on the ground to see that all the cement was used up on 11th November, 1891? No.
20486. Practically, therefore, you have no proof of it? Yes; I have the proof obtained from the papers and books.
20487. You say in paragraph (B), under the heading of "Stock of cement on Contract 72, on 5th December, 1891," "These parcels of cement correspond with the three last deliveries of cement prior to the stoppage of the work" (see page 587 of the printed evidence);—will you kindly refer to that evidence? Yes. The three deliveries are those of 6th November—Henry Austin, 300 casks of Alsen; 13th November—Parbury, Henty, 1,000 casks of "Camel"; 13th November, 407 casks of Germania.
20488. To begin with, how do you know that that thousand casks were untested? It is clearly so.
20489. But how do you know it? Because there is no record of a test at that time. There is a subsequent record of a portion of it.
20490. How do you know that the 407 casks of Germania were untested? Because in each case I have compared the deliveries with the tests judging from that, the two parcels to which I have referred were untested.
20491. That is what you believe? Yes.
20492. Will you show that these quantities correspond with the quantities referred to in Mr. Boys' minute—for instance, how does the 300 casks of Alsen's cement compare with his entry;—does it correspond with it? Yes.
20493. Another entry of his is 958 casks of "Camel"—does that correspond with the 1,000 casks? Yes.
20494. How can you say that;—in what way does it correspond? As regards the approximate quantity.
20495. You would say that 958 casks corresponded with 1,000? Yes, of the same brand.
20496. That is what you call accurate accounting? It is accurate phraseology.
20497. To say that 958 casks correspond with 1,000 casks? Yes.
20498. Then take the Germania;—do the 407 casks agree with 431—do they correspond? They do.
20499. According to your mind? According to anyone's mind, I should think.
20500. Will you read question and answer 16376 of the evidence of Inspector Fowle? Yes; they are as follows:—
16376. How many casks? I could not say from memory. I know there was a large number. There was also a large quantity of bricks. I see from my notes that on 15th June, 1893, there were 853 casks there.
20501. Will you now read Question and Answer 16509? Yes:—
16509. *Mr. Parkes.*] I suppose you counted the casks? As nearly as I possibly could. The note in my book is to the effect that there were 853 on the work on Thursday, 15th June.
20502. Will you now read the next question and answer? Yes; they are as follows:—
16510. *Mr. Davis.*] Do you swear that the 853 in your note-book represents the number of casks on the ground on the date you have put down there? Yes; that is the note I made.
20503. You would conclude from that that Inspector Fowle took stock at that date? Yes.
20504. That is the conclusion you would form? Yes.
20505. And that in that 853 casks he had all the cement which was on the ground at that date;—you think that is a fair conclusion to draw? Yes.
20506. Will you now read Question and Answer 16513? Yes; they are as follows:—
16513. *Mr. Davis.*] Will you read out the note you have opposite the date on 21st July, 1893? Yes. "Eight hundred and fifty Wouldham and Try's, and 500 Wouldham." Both of these were passed, and I have put opposite to them the letter "P"; that note is made as a sort of check upon the cement on that particular date. It would have been one of my usual checks upon the cement used in the work, as compared with the cement delivered on to the work. The note I am reading you would give the total quantity of cement upon the work on that particular day. The note continues, "Five hundred Germania, 80 Germania, and 69 from stormwater channel." The last part of the note would mean that 69 were delivered upon the work from another contract.
20507. So that soon after the date of the 15th June, 1893—that is, on the 21st July, 1893, it is evident from the same reliable source from which you quote—that is, Inspector Fowle's rough pocket-book, that the stock was materially increased? Yes; but the cause of it was that on the 13th June, 1893, Parbury, Henty, and Co. delivered 500 casks, and Henry Austin, on the 5th July, delivered 400 casks—Parbury, Henty, & Co.'s being Wouldham, and Henry Austin's being the 400 Germania referred to.
20508. I suppose you can vouch for the figures which you have put in as the total deliveries of cement in Contract 79. Yes.
20509. To the best of your belief they are accurate in every respect? Yes.
20510. I suppose you would stand by them? Yes.
20511. Will you turn to page 294 of your evidence? Yes.
- 20512.

20512. How many casks of cement do you say had been delivered on to Contract 79? The evidence to which you have referred me is as to the cement tested, not as to the deliveries of cement. The heading is, "Statement of the quantities of cement tested by the Department of Public Works for Contracts 79, 79A, and 69." G. Christie.  
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20513. A tabulated list follows that heading? Yes, of cement tested.

20514. And certified to by Mr. Roberts? Yes.

20515. How many casks do you make the total in regard to Contract 79? 5,050 casks, tested.

20516. What was the date of the last parcel of cement which was tested in respect to Contract 79? 6th April, 1894.

20517. Will you now read the entry which appears in the journal of Contract 79 for the 8th May, 1894? Yes; it says, "Run short of cement."

20518. What would you take that to indicate? It means this—that the contractors had estimated that a certain quantity would be required to finish the job, the last progress payment on which was made on May 7th, and that they may have wanted a few casks to finish up. The final certificate had been given, but there were probably little odd jobs to do.

20519. Seeing that the last delivery, according to your tabulated statement, was made on 6th April, 1894, and we have a note in the journal under date of 8th May, 1894, "Run short of cement";—what would you say that that indicated? I should say that they got a little from Contract 69.

20520. What would you say that the note in the journal indicated? That a few casks of cement were wanted.

20521. Would you say that the cement which had been delivered on the 6th April, 1894, had been exhausted? Yes; but they only wanted a small number of casks to finish the contract. Contractors such as these would not put themselves in the position of having their works stopped through their running short of cement. If a large quantity of cement had been required they would have had it over there.

20522. Turn to the next date—May 9th, in the same year, in the journal of 79—what does that say? "Cement arriving from Contract 69."

20523. So that it would appear from the entries made on the 8th and 9th May, 1894, that to begin with the cement ran out on the 8th, and that on the 9th a fresh supply was obtained from Contract 69? It proves that there were no more direct sales, and that there was a transfer from Contract 69. It would appear from those entries that the cement upon Contract 79 had run out, and it further established the fact that there was no delivery of a large quantity, but that a small quantity only was required, that being drawn from Contract 69. That does not affect the totals in regard to this cement question because we are dealing with the three contracts together.

20524. I am speaking now of Contract 79;—will you read the note under date of 26th May, 1894? I see it says, "Men run out of cement."

20525. I suppose that would bear the same construction as the note under date of 8th May? Seeing that the last progress certificate had been dealt with on the 7th May, there would not be much more cement required.

20526. You have read through this journal, I presume, from the 8th May, 1894, right up to the end of the contract? I may have done so a long time ago, but I have not done so recently.

20527. Judging from what you find there—that is, the number of entries each day with regard to concrete, brickwork, and plastering, from the 8th May to the 10th August of the same year;—would you say that a large quantity of cement was used between those two dates? I think we had better take the inspectors' reports. I would say, in view of the last progress certificate's having been given, a small quantity of cement only would be required.

20528. Taking the inspectors' reports, what quantity of cement would you say was used upon the contract from the 8th May to the completion of the work? About 140 casks.

20529. That would have to be added to the 5,050 casks to which you have already referred? Yes.

20530. So that in your total, if you can rely on the tests and also upon the inspectors' returns, the total quantity used upon Contract 79 would be 5,200 casks or thereabouts? Yes; that seems to be the case.

20531. If you refer to my evidence, upon page 631, you will see that I have made a calculation in regard to the quantity used upon Contract 79? Yes.

20532. Will you give the total opposite Contract 79? 4,642.

20533. *His Honor.*] That is an estimated quantity? Yes.

20534. *Mr. Davis.*] You will see from the heading of the statement that it is a calculation of the quantity which should have been used, taking the sandstone concrete, the bluestone concrete, the brickwork, (one-ring), and the cement facing? That is the heading.

20535. Will you look below and see what number is given in the inspector's returns in regard to Contract 79? 5,384½ casks.

20536. As having been used? Yes.

20537. So that the 5,384½ casks would not be very different from the 5,200 casks you have previously spoken of? It is evident that the figures are near one another.

20538. Now inasmuch as the quantity paid for, as you yourself have said in the evidence, does not include the quantity of concrete which was put into the lining, do you think that that would be a reason for the total calculation at 4,642 being different from the total given in the Inspector's returns? I am not prepared to go into engineering calculations at all.

20539. But it is evident, if we know that 5,020 casks were sent to Contract 79, and that when that was exhausted a further 150 casks were sent, that, let the cement come from where it may, according to my calculation and according to the returns, there has been ample cement supplied to Contract 79? No.

20540. Will you give your reasons for that answer? I cannot see that the contract could be really separated from Contract 79A.

20541. *His Honor.*] I understand that quantities have been given for 79 as distinct from 79A? Mr. Davis has made a calculation for 79 as distinct from 79A, but I have not.

20542. *Mr. Davis.*] I am dealing with Contract 79. Cannot you answer my question without reference to the other contracts? I can only deal with those two particular contracts together.

20543. *Mr. Gummow.*] Do you know anything about how long cement is often left upon contracts before it is used; have you had any experience of the accumulation of cement on contracts? Yes.

20544. Would it be surprising to you to find that cement, after it has been tested, might be allowed to remain

G. Christie. remain in the sheds six months, the contract in the meantime being in full working order? It is possible that it might be so, but no one would leave material lying unnecessarily long anywhere, because it represents money.

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20545. Still there could be an accumulation you think? It might happen under certain circumstances.
20546. You have gone through the banking accounts and vouchers of Carter, Gummow, & Co. and Carter & Co. as far as possible. Can you explain these promissory notes of Henry Austin, dated 20th February, 12th February, and 18th February—that is, as to the supply they were intended for, and when that supply took place? The three promissory notes you have handed me are promissory notes given by Carter & Co. for cement purchased from Henry Austin—on 12th February, 175 casks, £110 16s. 8d., delivered to Glebe; 20th February, 464 casks, £295 16s., delivered to Waverley; 18th February, 434 casks, £276 13s. 6d., delivered to Waverley. There is a slight difference, due probably for charges for duty stamps.
20547. You are satisfied that they went to the places you state? Yes.
20548. You said that in respect of Contract 79 the contractors would use sufficient foresight not to allow themselves to fall short of cement if they were wanting a quantity? I should think that would be so.
20549. Does that inference of yours hold good in respect of Contract 72? Yes.
20550. You think the same contractors would exercise foresight in regard to that contract? Yes.
20551. So that if they had use for the cement they would take every care that they had sufficient accumulated to keep them going? Yes.
20552. For all the work they had to do? Yes; but you had nothing at the time the work was stopped.
20553. You think they would take precautions not to let themselves run short? I presume so.
20554. *Mr. Parkes.*] There is evidence that the sale referred to in the claim of Carter & Co. in respect of Contract 72 actually took place? Yes.
20555. There is evidence as to sales to Flood and Danaher and as to the removals to other contracts? Yes.
20556. Which exhausted what quantity of cement? 1,607 casks.
20557. Now is there any record in the merchants' books which you have perused showing the sale of 2,000 casks over and above the balance reported by Mr. Boys in his minute—I mean the balance of 1,600 odd? Yes. In the accounts of Parbury, Henty, & Co. there are two credits representing, in one case 925 casks, and in the other case 1,000 casks, for cement which had been ordered but which was not delivered, for which Carter & Co. paid to Parbury, Henty, & Co. for cancelling sale 7½d. per cask.
20558. *His Honor.*] Do you remember the dates? There is a charge of 7½d. on 925 casks ordered and cancelled under date of October 24th, 1892, and in regard to the 1,000 casks there is a charge of 7½d. on November 29th, 1892.
20559. After the suspension of Contract 72 you have a complete record of the cement delivered there, have you not? Yes.
20560. Was that cement absolutely required? The statement shows that, including the 1,300 in stock, and adding to it the deliveries, there would be 3,454 casks gross available. The removals were 208 casks, and there was a sale to Flood of 350 casks and subsequent sales, making approximately 2,900 casks remaining upon the contract for the finishing of it. Mr. McCredie and Mr. Thompson estimated that the quantity required was 3,432 casks.
20561. That total, then, would correspond with Mr. Davis' estimate pretty fairly? I have not compared them.
20562. *His Honor.*] It is under Mr. McCredie's estimate? Yes, by 530 casks.
20563. *Mr. Parkes.*] Will you repeat the names of the brands of cement upon Contract 72 at the suspension of work—the cements reported by Mr. Boys to be in stock? Alsen, Camel, and Germania.
20564. What is the brand of the cement advanced upon and recorded as being used upon Contract 79? Wouldham.
20565. Supposing that cement were taken from Contract 69 to Contract 79, that would not affect the total of the three contracts in respect of which I made a charge of deficient use of cement? No; these three contracts were selected to be dealt with because we could get a definite start and a definite finish. They come in one with the other in that way.
20566. As a matter of fact, only Contracts 69 and 79 could have interchanged cement? Yes.
20567. *Mr. Gummow.*] As to 1,925 casks credited by Parbury, Henty, & Co., how long was that after the first stoppage of Contract 72? It would be twelve months after the notice.
20568. *Mr. Parkes.*] That was only the date of entry in the ledger? Yes. From what I gather, it may be that this was only an adjustment that had been pending for some time, it being recorded at those dates.
20569. *His Honor.*] Did not the books show the particular sales in respect of which the adjustments were made? Yes; but there was no delivery. The cement was not delivered.
20570. Do not the books show the date of the contract of sale? No.
20571. They would show only the delivery? Yes.
20572. *Mr. Davis.*] But if there were a general adjustment in October, 1892, is it not rather peculiar that the adjustment to which you refer as having taken place in November should not have taken place at the same time? The two were just about the same time.
20573. If what you assume is correct? The adjustment was really made in November in each case. They had evidently rendered the invoices to Carter & Co. in October, and the two adjustments were made in November.
20574. *Mr. Gummow.*] Is it likely that Parbury, Henty, & Co. would leave the matter for twelve months? No; but you had had some settlements in the meantime.
20575. You referred to Danaher's getting about 600 casks? Yes.
20576. Do you know where it came from? The payment for it was made in February, 1892.
20577. But do you know where the cement was delivered from? I have not a record of that.
20578. Had that cement anything at all to do with Shea's Creek contract as far as you know? From the evidence referred to I should say that the cement was carted across from Marrickville.
20579. Where do you find that? I think Mr. Carter gave some evidence relative to a sale to Danaher, but I am not quite sure.
20580. Can you find his evidence upon that point? I cannot just now.
20581. *Mr. Parkes.*] Are you not referring to a sale to Flood? It may be so. I turned up certain evidence on this matter, but I do not think I made a note of the folio. 20582.



20582. Would not the date of February, 1892, show you that this cement must have come from Shea's Creek? Yes; it was at the time of the stoppage. G. Christie.
20583. *Mr. Gummow.*] Is that the only reason you have for considering that the cement which was sold to Danaher came from Shea's Creek;—have you only the date to go upon? That is one reason. I have looked up certain evidence upon the matter, but I cannot put my finger upon it at the present moment. 16 Oct., 1896.
20584. Are the other statements which you have made founded upon no better facts than you can adduce in this instance? The facts, I think, have been pretty well tested to-day. I think you have gone through them all.
20585. Will you read question and answer 7654? Yes; they are as follows:—
7654. Then there is a cheque by Danaher, Taylor, and Britten for £300 9s. 9d.? Yes; that was for cement.
20586. Is there any other reference as to where the cement came from? There is no reference there, of course. The date is February.
20587. Had Carter & Co. other contracts on at that time? Yes; I think you had some cement sent to Waverley just about that time.
20588. I suppose you have looked up the contract notes which Carter & Co. made with reference to cement;—do they state anything about the delivery—that is, as to where the cement is likely to be delivered? I have not my records with me.
29589. Have you ever seen the contract notes? I have not seen the contract notes.
20590. Have you any idea as to whether Carter & Co., in buying cement for a particular contract, buy a total quantity, the deliveries extending over certain months of the year? From what I can remember of the transactions, they would order a large quantity at the time.
20591. *His Honor.*] To be delivered where ordered on each particular occasion? Yes; sometimes the place is specified and sometimes not.
20592. *Mr. Gummow.*] How do you know then where the cement was to be delivered? I am speaking now from memory of what I had before me.
20593. But did you see the contract notes? No; I am speaking from some records which I obtained from the broker, Mr. Mitchell.
20594. He had copies of the contract notes? He had the principal facts, I think.
20595. Presuming that Carter & Co. enter into a contract for 5,000 casks of cement, the deliveries extending over certain months of the year, I suppose you know it takes a few months to get the cement out? Yes.
20596. It is probably three or four months on the water coming out? I could not say about that, but I should say that you could get it out within four months if you wanted it.
20597. When it arrived, do you not think the contractors would be bound by their contract to take it? Yes.
20598. They cannot put it off for two or three months further? They would be bound to take the cement if it were imported specially for them.
20599. So that Carter & Co. would be obliged to take the cement as it arrived if they had a contract for that time? Yes.

Frank Moorehouse Gummow re-called and further examined:—

20600. *His Honor.*] Of course you have had a long experience in the use of cement? Yes.
20601. If cement is fit to pass the test at all, it must be pretty well free from any excess, at any rate, of anhydrous lime? Yes.
20602. It would be just in its prime at that time? Yes.
20603. How long will it bear keeping after that without risk of the lime's becoming combined with carbonic acid? You mean taking ordinary cement that will pass the test?
20604. Yes. Supposing it has passed the test, it begins at once slowly to deteriorate through the free lime combining with carbonic acid, does it not? Yes. If it were in casks in a compressed state I do not think you would see any difference in the casks for twelve months. There might be a little difference near the staves, but it would not affect the cask as a whole. It would deteriorate quickly, of course, if it were exposed to the air, but compressed as the cement is in the cask it is not practically affected.
20605. Still it is a fact, is it not, that the great point is to catch the cement, as it were, on the hop; to use it just after it has passed the test, or as soon after it has passed the test as possible? Not necessarily; we have had casks which have been too new, which have had too much free lime in them, and we have had to keep them for three or four months and then get them re-tested.
20606. But, supposing the cement to have passed the test, the object would then be to use it as soon as possible? Of course we have not had it re-tested after it has been once tested; but we have never found any weakness in the work through using cement that we have had in hand for, say, six months.
20607. What rule does the department make as to the use of cement after it has been tested;—is there any limit of time? No.
20608. Then, if a contractor chooses to buy a lot of cement, to store it, and to keep it for two or three years after it has had the test brand put upon it, would the department allow it to be used without re-testing? As far as I know. I have never heard anything to the contrary.
20609. Of course you would not keep the cement for that long period if you could help it? It is a matter of finance. That would be the main reason as far as the contractors were concerned.
20610. Then, if a contractor has large stock of cement, and suddenly finds that he has no use for it, assuming that, whether it is tested or not, it is fit to pass the test, he will not keep it on his hands if he can possibly get it off on any reasonable terms? Certainly not.
20611. That is the regular practice? I have never had experience in that matter. We have always been able to use all the cement we have purchased. If I had 1,000 casks more than I required I should look out for a market to get rid of it or for another contract which would take it up.
20612. As a rule, when cement has come all the way from Europe it would not suffer from the defect of having too much anhydrous lime? No; it is always considered to be in a sound condition if it comes out by sailing boat. Sometimes if it comes out by steamer it is not so. I have spoken to Mr. Roberts, the cement-tester of the department, with reference to that matter. He said to me on some occasions that cement sent in for test was too new, and that it wanted keeping a little longer. It would probably turn out that that cement had been brought out by steamer direct from the works.

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20613. Being only about six weeks on the journey? Yes, whereas a sailing vessel would be probably four months. The department now make us take a 28-day test instead of a 7-day test. That tends to keep the cement from use longer after manufacture than otherwise would be the case. Perhaps I had better explain to you the way in which cement sometimes accumulates in a shed. You may have a thousand casks of cement in hand. You may not be using very much, perhaps only 200 or 300 casks a month. Perhaps another shipment of your contract with the merchants will come to hand, and you stack that in front of the cement you are using. It is probable that this new cement may be passed and used before you would use the old tested cement. I have seen cement kept in that way upon our own works fully six or nine months. Fresh cement has been used, because the old cement happened to be at the back of the shed.

20614. It would not be a good plan to adopt if you could help it? No; but you cannot regulate your contracts to time in the same way that ships come out to time. You anticipate often that you will be ready for, say, heavy concreting in March; but you may not, perhaps, be ready until May, for some unforeseen reason. Your cement, however, will arrive all the same.

20615. The shafts on Contract 79 were very deep, and were through hard sandstone. The tunnelling was also through hard sandstone. How soon would you anticipate that upon a contract of that kind you would want to use your first cement after beginning the work? I should say there were shafts upon Contract 79, although I had nothing to do with it, which would vary from 80 feet to 150 feet in depth. In that case you would have to drive probably only 6 chains between the shafts. In other cases you might have to drive 8 or 10 chains. You do not start concreting until you have holed through from one shaft to another. You may be able to commence at the shallow shafts and short drives in from four to six months before you would be in a position to commence in the other parts of the work. We always endeavour to prevent our concreting from getting into one lump if we can, carrying it on as steadily as possible through the contract, the object being that the work may be in the hands of one gang of concreters instead of several.

20616. So that you would get the short shafts done as quickly as possible? Yes. By this means you turn over your material as well as your wages, and by getting one gang of concreters, instead of two or three, you get a better class of men. The same thing applies to bricklaying and plastering. It does not do to have all your finishing work coming on in a heap.

20617. How soon would you have expected upon Contract 79 to get any cement work going after the start? I should not think it would be before six months after the commencement of the contract.

20618. So even if you were certain of getting that contract, and you had cement in hand, you would be doubtful about holding the cement for use upon the contract? Under ordinary conditions certainly. A good deal would depend upon how the market was with regard to cement—that is, whether there was a big supply in the market, and also upon how prices were.

20619. As to that, you do not know what was happening at the end of 1891 or at the beginning of 1892? No; I could not tell you that. There are such a number of circumstances which might arise at the time that it would be very difficult for me to say now what would be the reasons for taking action at that particular period.

20620. Of your own knowledge you know nothing about the fact of the storage or the use of cement on the contract; but there might have been a storage of cement on the site of Contract 79 at its inception by Carter & Co.? Yes.

20621. You had nothing to do with that contract? No.

John Carter sworn and further examined:—

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20622. *Mr. Gummow.*] As to the 600 casks of cement which Danaher, Taylor, and Britten, purchased from Carter & Co., from where was it delivered? From the Glebe contract.

20623. It did not come from Shea's Creek at all? Certainly not. It was taken out of the Glebe yard, and a distinguishing mark was painted upon it by the Government inspector. It was then sent down to the wharf and taken off to Danaher's railway contract. The whole of the facts connected with the transaction are clearly impressed upon my memory.

20624. Do you remember who was the Government Inspector upon the Glebe contract? Gledhill. I remember he painted every cask we sold to Danaher with a big red Broad-arrow. That is how I came to remember the transaction.

20625. As to the purchase of cement, do you remember if you made any lump contracts with any firm or whether you made contracts for the particular works you had in hand? The practice with regard to the purchase of cement is to purchase it at once, directly a tender is accepted—the whole of the cement estimated to be required for the contract.

20626. And how were the deliveries to be made? We arranged the deliveries as we thought they would be required. For instance, on one contract we might want 10,000 casks of cement, the delivery to begin in three months, and to proceed at the rate of 3,000 a month. In another contract we might want the delivery to begin in six months, and to proceed at the rate of 1,000 a month, or even 1,000 every second month. We endeavour to regulate the supply according to the demand, but we invariably purchase the whole of the cement required in one lot. If we have a contract which will take 50,000 casks we purchase cement immediately, to arrive, perhaps, over two years. By doing that we get it at a lower price, and we obtain better results in every way.

20627. Do you know whether, at the particular period to which I have referred, there was much demand for cement? Not a great deal, as far as I know.

20628. Do you pay cash for the cement? No; I pay in P.Ns. or cheques, just as it suits.

20629. You have always been a believer in having big stocks of cement on hand? Yes.

20630. Your firm has afforded a marked contrast to other contractors in that way? Yes; I believe in having plenty of material.

20631. Is there any other statement you desire to make to the Commission? Yes; I desire to say a few words with reference to our claim in respect of Contract 72. Mr. Christie seemed to think that the 2,000 casks of cement was not in stock in addition to the 1,300 casks of passed cement when we made our claim, and I wish to distinctly and emphatically state that that cement was on the ground. The 1,689 casks which Mr. Boys referred to in his journal was passed cement. The difference is accounted for by the

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the amount which had been used. The quantity was reduced to 1,300 casks at the time the claim was made. No doubt we used 300 or 400 casks in plastering and finishing up the contract.

20632. The claim was made up by Mr. B. C. Simpson? Yes.

20633. Upon what facts did he make it up? Upon some facts and figures with which I supplied him.

20634. You supplied him with the two items of 1,300 casks and 2,000 casks? Yes.

20635. So that you were satisfied that they were the quantities in hand at that time? Yes; I know it as an absolute fact.

20636. You put down 2s. 6d. a cask as the probable loss on 2,000 casks? Yes.

20637. From that it would appear, then, that the market must have been going down? The market, undoubtedly, was going down, because it has been going down ever since steadily. Not only that, but you must remember that the cement was stored in a very out-of-the-way place at Shea's Creek, and if we wanted to sell it to any other contractors we should have to load it and cart it some considerable distance. We should have had to sell it at a lower rate than we should have received for tested cement. All these items added together go to make up the 2s. 6d.

20638. Do you not buy your cement from merchants upon the understanding that they guarantee the test of it? Yes; but in this case it was not the merchant's fault. We wanted the cement tested, but the department refused to test it.

20639. Therefore, in that case, you bought the cement from the merchants without getting it tested? Yes; we endeavoured to get the cement tested by the department, but, although we failed to get the test, the merchant, of course, had to be paid.

20640. As to the cartage of cement from 72 to 79—I think you have heard the evidence of the witness Burcombe, who was brought here by Mr. Parkes;—what have you to say as to the carting of that cement—have you any recollection of the occurrence? I recollect that it was carted, but I do not remember the quantity. I know that we were carting cement for a considerable time to North Shore from Shea's Creek. I know that the weather was wet, and that the ground at Knight's paddock shed was in a boggy state. I was asked by the carters to pull the back of the shed out to let them get at the cement in that way. I am almost sure, however, that Burcombe in his evidence made a mistake as to the time of the year at which the cement was carted.

20641. *His Honor.*] In what respect? I think it was carted much later in the year than he said. One of my reasons for making such strenuous efforts to obtain Contract 79 was in order that we might successfully deal with the matter of cement coming forward. We had no idea that the Shea's Creek contract was to be gone on with, and we were brought face to face with the question of getting rid of the cement we had already provided. Those are the whole of the facts with regard to that cement transaction. The cement was carted to North Shore and was stored there. I cannot speak as to the exact date, but I am almost confident that Burcombe made a mistake as to the time at which it was carted.

20642. *Mr. Gummow.*] Do you know how many carters were on? I have no idea. I know that they were carting out of that shed for weeks, and that it was wet, miserable, weather. I remember also that we had to put 40 feet on to the Knight's paddock shed in order to take delivery of cement which we were not using. When the contract was stopped we were still taking delivery of cement. Some of this remained in Knight's paddock for months after we had finished the contract.

20643. *His Honor.*] You mean after you had finished the extension? Yes. There was a considerable quantity of cement in the shed. There was no other place to which it could possibly go except Contract 79. We had no other contract in hand.

20644. Then you would have had too much cement actually for the contract in its entirety? No doubt.

20645. How is that? It is hard to estimate within 500 or 1,000 casks what will be required. I do not say that there were 2,000 or 3,000 casks left, but I know that the shed had a considerable quantity of cement in it, and that we paid rent for it for a long time.

20646. *Mr. Gummow.*] Latterly, did you not make two contracts of 6,000 casks each with two different people for Contracts 118 and 77? Yes.

20647. Had you not found from experience that you could not use that 12,000 casks? Yes.

20648. So that it is not an unusual thing to make a mistake in your estimate of the quantity required? No. And as I have already explained, we always endeavoured to obtain plenty of material. We are continually obtaining contracts, and if we had a thousand casks more than we wanted upon Contract 79, we should know that it would be of use for the next contract. We do not cut the quantity down to half-a-dozen casks.

20649. Is it not a usual thing with merchants to ask you whether you can take a thousand casks from them, over and above your contract quantity, just to relieve them of storage in the city? Yes; it is a common occurrence.

20650. And you would pay them four or six months afterwards? Yes.

20651. You have done that in the past? Yes. We have at the present time to take delivery of cement for a contract we have not signed. It is a large quantity—from 1,500 to 2,000 casks. We shall not want it for the next six months, but we are going to store it to oblige the cement merchant.

20652. Is it not a fact that at times when no other contractors, comparatively, have any cement you frequently have a good supply? Yes, undoubtedly.

20653. With regard to the cartage of cement, you have heard Burcombe's statement that he made three trips a day from Shea's Creek to North Shore;—what have you to say to that? The fact that Burcombe made these three trips is pretty well known to me. Burcombe, especially, was noted as being a very hard man on his men and horses. It is a matter of public knowledge that carting firms sometimes generally start their carts at 4 o'clock in the morning, and end the day whenever they can, sometimes at 8, 9, or 10, o'clock at night. The exceedingly long hours and hard work which Burcombe's men had to undertake was a matter of comment amongst the other men. I think Burcombe was a little wrong in saying that he made three trips a day every day. I think his practice might have been, as I know has happened in many other instances, to make three trips one day, and two or two and a half trips the next day. I might explain that in this way: The man would start in the evening on his third journey, and he would come down as far as the stables, and then unhitch and leave the cement there for the night. That is what they would call a short day. On the next day he would take it over to North Shore, and on that day he might make three trips. It frequently happens that they make three trips on one day, and on the next two and a half, and so on. I know that that is the practice in brick and sand carting, and with other heavy drawing.

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20654. *His Honor.*] What do you say as to the distance between the two places? It is about 6 miles going right up to the yard and taking the road which I think the men would be likely to take going from the Knight's paddock shed. It seems a long way, but, knowing Burcombe as well as I do, I should say that he is very likely to have made the three trips. Mr. Boys said the other day that he did not remember seeing cement and brick carts on the Milson's Point Road late at night, but when we have been riding on the tram together, we have seen cement and brick drays going up as late as 8 and 9 o'clock.
20655. Although they would have made a start early in the morning? Yes. The hours some of these carters work their men, and for comparatively small wages, are astonishing.
20656. *Mr. Gummow.*] Is it not a fact that the brickcarts are often on the contracts in the morning before the men are there to count the bricks which come off the carts? Yes; and it is a very common experience to leave men to count the bricks after dark, and on Saturdays up to 7 or 8 o'clock in the evening. I believe some of them would cart on Sunday if you would allow them.
20657. *Mr. Parkes.*] In speaking of the long hours of the men, you have not taken account of the fatigue of the horses? I do not recognise horses in the matter; but I do know that the men work for these long hours repeatedly.
20658. You would have to allow three hours a day for feeding the horses? They must be fed, certainly.
20659. Where was Danaher, Taylor, and Britten's contract? It was the railway from Lismore to The Tweed.
20660. The cement was sent there? Yes.
20661. Did they buy the cement on the same date on which they paid you the cheque? I really could not tell you. I do not think it is at all likely that they would pay for it on the day on which they got it.
20662. But it would be pretty close to that date, I suppose? No. Now you remind me of it, I think that Danaher allowed the payment to stand over for a long time, and apologised to me afterwards about it. It was a friendly transaction. He paid when it suited him, I suppose. I knew that I could get payment when I wanted it. He had plenty of money.
20663. Did you yourself see the 2,000 casks of cement in the Knight's paddock shed at the time your claim was made in respect of Contract 72? I did.
20664. Was it there in the month of March when Contract 79 was let? Yes.
20665. Where was the cement delivered by Burcombe at North Shore? It was delivered to No. 1 engine-shed at Cameray Park. A small quantity would go there. The bulk of it would go into the main shed at Alfred-street, near the reserve.
20666. Did you have the cement tested before it left No. 72? I do not think so.
20667. Did you apply to have it tested when it went on to 79? Undoubtedly, otherwise it would not have been allowed to be used; but it does not follow that it was tested as a parcel from Shea's Creek.
20668. But it was tested, you say, upon Contract 79? Undoubtedly, or it would not have been allowed to be used.
20669. Did it all go by horse-ferry? Yes; there would be no other way in which it could go.
20670. Would you pay the ferry fees, or did Burcombe pay them? We should pay those fees.
20671. By cheque? No, certainly not. We rarely paid the men's wages by cheque.
20672. But I mean the ferry fees? They would be charged in Burcombe's account.
20673. *His Honor.*] They would be paid on each occasion he crossed, I suppose? Yes; Burcombe would come and collect £1 or £2 from petty cash for the payment of the ferry, and it would be accounted for at the end of the fortnight.
20674. Would the Company charge by the week? No; Burcombe came to us from time to time for the money.
20675. *Mr. Parkes.*] There were not monthly tickets? No.
20676. You bought from Henry Austin, and had delivered on the Glebe job on 12th February, 1892, 175 casks? I could not tell you.
20677. If that entry appeared in Henry Austin's books, that would be correct? Yes.
20678. That was the last purchase you made upon the Glebe contract? I could not tell you, but whether it was so or not, it does not follow that we had not a thousand casks in the shed at the same time.
20679. But had you, as a matter of fact? I could not say.
20680. You could not say from your own knowledge that you had? I have not any idea. I know that we always had plenty of cement, and that is all I care about. I do not care whether there are 1,000 or 2,000 casks over, so long as we have enough to complete the works we have in hand.
20681. Did you deliver to Danaher, or did Danaher take delivery himself? We delivered to the wharf, but it was his lookout when the cement got aboard the steamer.
20682. Who were the carters who drew the cement? It would be impossible for me to say. I remember on one or two occasions that we were taking delivery of cement from merchants—from Henry Austin, probably—and the lorries which brought out that cement took loads back to the wharf for Danaher. By this means a saving was effected to both Danaher and ourselves. It did not happen very often, but it did happen. Who the carters were I cannot say. Probably Burcombe would be one of them.
20683. Did you, upon Contract 72, obtain an advance upon your cement? We did not, as far as I can remember. I think we applied for it, and the department refused it.
20684. When did you deliver Flood's cement on that contract, on the second occasion in 1892, when he paid to you a cheque for £200 odd? I could not say.
20685. That cement was sent across to Ashfield, was it not? No; I do not think so, but I would not like to say definitely. I am positive about the cement we supplied to Danaher, because of the marking of it, because we took so much trouble with it, and because of its delivery to the wharf. Those circumstances all impress that transaction upon my mind, but I am not sure about the other transactions, because they were ordinary occurrences. I think that some of the cement which we let Flood and Rutherford have went from the Glebe.
20686. Do you recollect the brand of cement you sold to Danaher? I do not.
20687. If you took such care, as you say you did, in the marking of it, would you not be likely to have noticed what brand it was? The brand of the cement had nothing to do with our putting the distinguishing mark upon it. We did not care what brand of cement it was so long as it was passed cement. I have not the slightest recollection as to whether it was Camel, Germania, or Wouldham. We were buying four or five brands at that time. I remember the sewerage inspector climbing on to the cart and painting on the arrow with red paint.

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20688. *Mr. Gummow.*] There is a voucher from Danaher showing that there was paid into the credit of Carter & Co., on 9th December, 1891, a cheque for £130;—you must have delivered the cement a good deal before that? Yes, undoubtedly. I know that we gave him long credit. He was away in Lismore.
20689. *His Honor.*] What would you call long credit? Perhaps it would be six months, perhaps more.
20690. *Mr. Gummow.*] Mr. Parkes referred you to an entry of some 160 casks of cement at the Glebe in February, 1892? Yes.
20691. There is a cheque paid in by Danaher for £292 5s. 2d. on 22nd February, 1892. Can you recollect going to Mr. Mitchell's office, and asking him whether he could let you know something about Danaher's cheque? Yes.
20692. Can you remember the date when Mr. Danaher was written to and asked for the cheque for Carter & Co.? Yes; I think it was Christmas Eve.
20693. The cheque was outstanding a good while? Yes; Mr. Mitchell, I understood, wrote on his own authority; it struck him that it was time we were paid.
20694. That circumstance helps you to remember that Mr. Danaher was a long time paying the cheque? Yes; I could not say whether he had six or eight months' credit, but I know it was a long credit.
20695. You say that it is impressed strongly upon your mind that the cement went from the Glebe contract? Yes.
20696. And you remember that it was for railway purposes? Yes.
20697. And that the Railway Department was very particular about taking cement from the Sewerage Department? Yes; I remember Mr. Danaher's asking me to call up and see Mr. Deane, in order that we might ascertain what could be done in the way of making an arrangement whereby Mr. Danaher could be supplied with this cement, as, if it could not be supplied, his works would be entirely stopped owing to the want of it. You cannot do very much in the case of railway embankments until the culverts are built, and Mr. Danaher experienced great difficulty in getting cement passed. I took some trouble in the matter, and finally obtained Mr. Deane's consent to the transfer.
20698. So that that particular transaction in cement was very strongly impressed upon your mind? Yes; I have a very clear recollection of the whole of the facts.
20699. But that would not be likely to be the case with regard to the cement which you supplied to Flood and Rutherford? No; that was an ordinary transaction such as might occur half a dozen times in the year. I might not know anything about it until it was over.
20700. *Mr. Davis.*] Reference is made in the journal of Contract 72 on the 21st December to 198 barrels of cement leaving for Iron Cove Creek;—would not that be Flood and Rutherford's? Yes; it was to go to the Iron Cove stormwater works. Your mention of the Iron Cove reminds me of the Careening Cove cement which was spoken of the other day. We sold to Mr. Johnson some 130 casks. I think that was returned to us and not paid for. It was a transaction in connection with Contract 79. The cement was stored in the small shed at the top end of William-street.
20701. *His Honor.*] Do I understand you to say that almost the whole of the 2,000 casks of untested cement upon Contract 72 actually went to Contract 79? There is no doubt at all in my mind about that.
20702. You had, you say, upon Contract 72, when you started again, some 1,300 casks of tested cement? We had 1,300 casks of tested cement. That is shown in the claim which we sent in, and I should have tried, if the claim had been thrashed out, to insist upon the department's taking that cement themselves. I contend, as I have contended all along, that when once they have tested cement for a work, that cement is their property. When we have put it on the job for them, and it has been tested, they must be considered to have taken delivery of it. The 2,000 casks were certainly not their property. It had not been tested. The department themselves took the same view as we did in that matter, and refused to test it. To my mind, it is very definite, according to the journal, that the two lots were separate. Besides, Mr. Boys distinctly mentions three sheds. He refers to the three lower sheds along the line of sewer which were actually working. The Knight's Paddock shed was at the top end of the work which was cut out. Cement was waiting there for the work to get up to it. Mr. Boys spoke distinctly of the lower sheds on the work from which the cement was being used.
20703. How soon after starting the upper part of the work would it be when you would first want cement upon it? We should want it almost immediately. Then the 1,300 casks would be brought up from the other sheds.
20704. But you would use a great deal more than 1,300 casks? Yes; but I do not think there is any dispute as to our getting more cement in after the work had been begun.
20705. Do you know when you finished Contract 72 finally? I should think about four or five months after we began. If we began in March, we should probably finish in August or September.
20706. How was it that it became necessary to shift the 2,000 casks? We did not know that the Government were going on with Contract 72.
20707. It was shifted sometime after you had begun? Some of it. But we had another shed under the railway arch which would take a good deal of cement. Mr. Boys appears to have forgotten that. It was not a big shed, but it would hold a fair quantity.
20708. But if you had 2,000 casks stored upon 72, near where the work was going on, and if you had other cement which you had contracted for coming in, how was it that that other cement was not delivered to Contract 79 instead of being delivered to Contract 72;—how was it, under those circumstances, that the cement was taken across from Contract 72 to Contract 79? We took delivery of cement on Contract 72, as fast as it came to hand.
20709. But when did you take delivery of it;—was it not actually after Contract 79 had been given to you? It does not follow, because we only claimed for 2,000 casks of cement in the claim which has been referred to, that there was no more than 2,000 casks there. The 2,000 and the 1,300 casks were all that was required, and it had nothing to do with the department if we chose to deliver 5,000 casks. What we claimed upon was tested cement sent to finish the contract. It does not follow that there were not 4,000 casks in the sheds.
20710. The 2,000 casks would not be the limit of the cement in the various sheds? No; we mentioned the quantity required for the work to be done. As the papers will show, we were getting delivery of cement in large quantities, and we had to take it out there. Another reason we took it there was that an extension was in contemplation going from the end of our first contract right through Newtown and Erskineville, and we thought we would store the cement out there, and, if the worst came to the worst, that we could sell it to the successful contractors for the next section.

20711.

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 20713. I understand that you did not get any advance upon the cement which was brought down to Contract 79? No.  
 20714. Can you explain how it was that some time afterwards, when you did get an advance, there were 800 odd casks? Yes; it seems to point to the fact that Burcombe carted the cement at a much later date, because if it had been on the ground there is no doubt we should have asked for an advance upon it. I felt sure at the time Burcombe was giving his evidence that he was making a mistake in the date.  
 20715. *Mr. Davis.*] Will you refer to the entry in the journal, under the date of 22nd April, after the resumption of work upon Contract 72? Yes; it says, "fresh quantity of cement arriving on the work, Germania."  
 20716. According to the journal, the work was resumed on the 19th April;—is not that so? Yes.  
 20717. So that two days after that, you were delivering more cement? Yes.  
 20718. Will you look at the entry under date 27th April? Yes; it says "Required samples for testing 339 casks, Germania brand cement, sent to office."  
 20719. On 3rd May, you will find another entry as to cement? Yes; it says, "Samples from 600 casks, Germania, a cement sent in for test."  
 20720. Will you now read the extract, under date of 11th May? Yes; "Samples from 1,030 casks of Germania cement sent to be tested."  
 20721. So that it is pretty evident that large quantities of cement were being delivered on to the ground just about that time? Yes.  
 20722. Looking at the record of cement tests, on 9th March, 1892, how many casks were tested for Contract 72? 360 casks.  
 20723. On the 16th March, how many casks? 700 casks.  
 20724. On 28th April, how many? 339.  
 20725. On 4th May, how many? 390 casks.  
 20726. And on the same date, there was a further test? Yes; 600.  
 20727. On 12th May, how many? 1,030.  
 20728. On 12th June, how many? 194.  
 20729. On 18th July? Ninety.  
 20730. On 29th July? 200.  
 20731. On 1st September? 410.  
 20732. How many casks would appear from that to have been tested on Contract 72, after the resumption of the work at beginning of 1892? 4,300 casks.  
 20733. So that if I calculated that about 3,000 casks were required, and the inspector's reports showed that 3,000 casks were used on the works after the resumption, there would be a balance left even after that, which would not be used upon the works? Yes, from 1,000 to 1,300.  
 20734. Do you remember when the extension was given to you upon Contract 72, that it was verbally agreed to take the unemployed on to that contract if it were given you? Yes; I do recollect the circumstances now.  
 20735. And did you not get your men from the Labour Bureau? Yes; I believe we did. Mr. Forrest was there, and he was supplied with a list. I had forgotten that.  
 20736. It was one of the conditions, therefore, upon which you got the work, that you employed men from the Labour Bureau? Yes; I think that is correct.  
 20737. *Mr. Gummow.*] With regard to Burcombe, have you seen him at all, or have you had a talk to him? No; I have lost the run of him for some time. I find that he is working, not for us, but that he is carting for someone else who is working for us. He has lost his own carts and everything else.  
 20738. Have you got any information from him? I have never spoken to him on the subject.  
 20739. Have you supplied him with information? No.  
 20740. So that, as far as this statement is concerned, he is stating what he believes to be the fact? Yes; as far as I know. I have never spoken to him directly or indirectly on this or any other subject for a very long time. I have lost sight of the man altogether.  
 20741. So that when he was brought here by Mr. Parkes you did not know what evidence he was going to give at all? No; I had not any idea.  
 20742. *Mr. Parkes.*] Can you swear that all the parcels of cement to which you have referred passed the test? Certainly not.  
 20743. *His Honor.*] As to the deterioration of cement, can you give us any information as to that? Well, it may deteriorate to some extent, as your Honor's questions to Mr. Gummow seemed to suggest, but that does not concern us. It is a matter for the department. We certainly have never had any intimation that we were not to keep tested cement. As Mr. Gummow stated, it often happens, through force of circumstances, that we do keep it. If there are 200 or 300 casks of tested cement lying in a shed, and a shipment happens to come in, then, if the tested cement is not urgently required at a short date, the new cement would be put into the shed on the top of it, and when it had been tested we should haul away at the contents of the shed indiscriminately. Cement will accumulate in that way, and it often happens that cement which has been tested for some time will be covered up by newer cement which has also been tested.  
 20744. The department make no rule as to the use of cement which has been stored for some time? No.

Joseph Davis called and further examined:—

- J. Davis. 20745. *His Honor.*] You wish to make a statement? Yes. I have examined certificates of the cement submitted for test from 9th March, 1892, to the 1st September, 1892, for Contract 72, and I find that  
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 20746. The conditions appear to have been complied with? Yes.  
 20747. *Mr. Parkes.*] Can you yourself swear that the parcels are correctly given? That the numbers of casks given in the tests are correct—no, I cannot.  
 20748.



20748. *His Honor.*] What do you say then? That the cement would be counted by the inspectors at the time they sent in the samples. That number would be conveyed to Mr. Roberts, and would be transferred to the test-book. J. Davis.  
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20749. But you cannot, of your own knowledge, swear that the number of casks in each case is correct? No; in this connection I should like to refer your Honor to page 294 of the evidence. The following evidence was there given by Mr. Christie:—

10064. The book containing the cement tests by the Department is very carefully kept, is it not? It seems to be.
10065. The name of the contract to which cement is delivered is inserted? Yes.
10066. The name of the contractor is also inserted? Yes.
10067. Also the number of casks? Yes.
10068. And to show with what care the book is kept, there are only two alterations in the number of casks affecting tests in which Carter, Gummow, & Co. were concerned? Yes. There are two quantities indefinite in that respect. In one case 700 in red ink is put over 500, and in another case 600 is marked for 500. In neither of these cases do the certificates affect the return I have handed in.

Your Honor will see from that evidence that Mr. Christie appeared to regard the tests, as recorded in the book, as being on the whole reliable.

20750. *Mr. Parkes.*] I should like you, Mr. Davis, to swear to each one of these certificates in routine as containing passed cement, commencing with the continuation of the contract in April, 1892. I suppose the second contract would not start until April? No; I find upon looking through the tests that, as regards the test under date of 4th May—I mean test 682—there is some doubt as to whether the 390 casks there referred to were for Contract 72 or for Flood and Rutherford's contract.

20751. What is the brand of cement in that case? Globe brand.

20752. Was there any Globe brand upon Contract 72? I cannot say; there may have been. That particular test is the only doubtful one in the whole of those which I asked Mr. Carter to refer to.

20753. You are aware that according to Mr. Boys' journal there was a transfer of 282 casks to Waverley? I am not. What I am aware of is that cement has been carted about in some unaccountable manner from contract to contract. We could never keep any proper check upon it.

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David Graham Snodgrass sworn and examined:—

20754. *Mr. Gummow.*] What are you? A contractor.
20755. You were a partner in the firm of Carter, Gummow, & Co.? Yes.
20756. Are you still a partner in the firm of Carter & Co.? No.
20757. Are you a partner in the firm of Carter, Gummow, & Co. at the present time? No.
20758. When did you retire from the firm? About the end of last year; I forget the exact date.
20759. Prior to becoming a contractor, what were you? Contractors' manager and engineer.
20760. For whom? Latterly for Mr. Edward Pritchard.
20761. Upon what works? On the Bondi sewer—the Double Bay and Rusheutter Bay's sections.
20762. Previous to that you were employed by contractors in New Zealand? I was manager and engineer for the first section of the Otago central railway.
20763. You were educated under engineers and under railway contractors in New Zealand? Yes. I was about twelve years under an engineer on railway contracts in New Zealand.
20764. Do you consider that you are a capable engineer for any public works contract? I think so.
20765. Have your employers always been satisfied with you as an engineer, as far as you know? They have always expressed themselves so.
20766. So that if it has been stated that you are not a capable man to look after contracts, would that be true or otherwise? It would be untrue.
20767. With regard to the sewerage works of Sydney generally, do you consider that you are capable of looking after any contract which might be carried out in connection with them? Yes.
20768. As a contractor you would not have to employ any man to do any work which you would not be capable of doing yourself in the engineering and managing line? I could do anything required upon sewerage contracts.
20769. With regard to the making up of tenders, are you capable of doing that kind of work? Yes, decidedly.
20770. Do you pride yourself on what you can do in that direction? Yes, particularly.
20771. With regard to the Waverley contract, had you anything to do with it personally? Yes; I made out the tender.
20772. Had you anything to do with the practical carrying out of the work? Yes; I put the job in working order. Then I used to go once a month and make up the quantities of work done, as a check against the Government engineer, for the purpose of getting our progress payments.
20773. Do you remember some arches being built down in the Double Bay Valley? Yes.
20774. Do you remember what they were built of? The piers, I think, were of sandstone concrete, and the arches were of bluestone concrete; but I could not be positive.
20775. Do you remember if they collapsed? Not one of the arches in connection with the sewer; but there was a culvert across the creek there—I think that was built entirely of bluestone concrete—in connection with which the foundations were not very good. The ground was excavated to a good depth, until the foundation was considered to be sufficiently good. Then the culvert was put across. It had set for some considerable time, and then the centering was withdrawn. Then, to all appearance, one of the walls sunk slightly, and caused a crack somewhere about the springing of the arch. (*Vide Appendix No. 82.*)
20776. Did you pull the arch down? No; we got instructions from the department to put tie-rods through, to screw them up thoroughly, and to cut out enough room where the crack had taken place to make the work good. 20777.

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20777. Do you remember a man named Hamilton on that work? Yes.
20778. Do you remember any defective work, or anything of that kind, in connection with what he did? I do not remember any defective work, but I remember his getting into a row for defective bricks. I consider myself that the bricks were as good bricks as were ever put into the works; but Mr. Davis did not hold the same opinion as I did, and he kicked up a row with Hamilton for allowing them to be used, with the result that they were pulled down. (*Vide Appendix No. 83.*)
20779. Were the contractors paid for that work? They were not paid for either putting it in or taking it out. The work was condemned. Ten or twelve thousand bricks alongside the work, ready to be put in, were also condemned, and the contractors carted them away.
20780. You said that none of the arches were pulled down; is that correct? Quite correct.
20781. So that if it has been stated that some of the arches collapsed, would that be true? Decidedly not. Even the culvert arch did not collapse. It cracked slightly from the cause I have mentioned.
20782. Do you remember a man named Reidelberg on the works? Yes.
20783. Do you remember anything occurring in connection with his work? I remember his being accused of not packing the brickwork properly.
20784. Did you take any action, or had you anything to do with the matter? Mr. Carter and I took action as the heads of the firm, although we were not in immediate charge of the job at the time. We suspended the man, and had him taken off the work.
20785. *His Honor.*] Who was in immediate charge of the work at the time? A man named Rogers, who was then a partner. We bought him out. I could not say, now I come to think of it, whether we bought him out before or after this thing occurred. But while he was a partner he was in immediate charge of the works, and after we had bought him out I think we left him in charge of the works until they were finished.
20786. *Mr. Gummow.*] Do you remember a pipe contract you had at North Sydney? Yes.
20787. Who was in charge of it? Mr. Forrest and Mr. Carter.
20788. Had you anything to do with it? I used to go once a month and meet Mr. O'Hanlon, the Government engineer, to make up the quantities with him. That is all I had to do. I did not take any measurements or do anything of that sort. They were taken before I went there. I used to settle the quantities with Mr. O'Hanlan, but I had nothing to do with the carrying on of the work.
20789. As to Contract 61—the Alexandria contract—had you anything to do with that? Only in the same way—that is, making up the quantities. When we were preparing to start the job I gave the carpenters instructions about making the ribs—that is, I drew the shape of the ribs for the concreting. I had nothing to do with the carrying on of the actual work.
20790. So that you cannot tell us anything about the actual work upon Contracts 60 and 61? No.
20791. But you had to do with the setting out of the ribs? Yes.
20792. By whom was that done? I do not remember the carpenter we had on that job.
20793. Do you remember a man named Tom Wright? Yes.
20794. Do you think he was the man? I dare say he might have been. I think he was, now I come to think of it; but I am not quite sure.
20795. You remember Wright? Yes, well.
20796. What is your opinion of him? He was a good carpenter, but he was a cantankerous sort of fellow.
20797. Did he take a drop too much to drink sometimes? Yes; like some of the rest of us, he had that little failing.
20798. You had a contract at the Glebe, I believe? Yes.
20799. Did you get that upon your original tender? No.
20800. How did you get it? We bought out the firm of Cowdery and McLean. They had been working at it for some four months. They had done between £400 and £500 worth of work, and they had put up a cash deposit of £1,500. We bought them out for £625.
20801. Did you get departmental sanction to that? Yes.
20802. Had you anything to do with that work directly? Yes.
20803. Were you in charge of it? I was in immediate charge; but I seldom went down in the tunnels except to measure up with Mr. Rudolph, the Government engineer.
20804. Did you ever give instructions for the doing of bad work on that contract? No.
20805. Did you ever see any done? No.
20806. Do you remember a man named Chiene being employed upon the contract? Yes.
20807. What was he? I employed him as an engineer.
20808. How long was he in your employ, do you remember? Two years, I think. He may have been a month or two over that period, but we engaged him for two years.
20809. Can you tell His Honor anything about Chiene;—what is your opinion of him as regards his work? He is a slow-going man, as regards the taking out of quantities, but he seems to be able to do the work fairly well. He is rather independent sometimes. When he gets a few pounds he sometimes goes away on the spree, and as a consequence he will make mistakes sometimes.
20810. Had you anything to do with the Shea's Creek contract? Very little. I used to go down on a sort of visit to it once a fortnight or so.
20811. Who was in charge? Mr. Forrest.
20812. What did you do when you went down;—what were your duties? I did not go down as a matter of duty at all. I used to go down to see how the work was going on, and to have a yarn with Mr. Forrest.
20813. Had you anything to do with the measurements? I made up all the measurements on every contract we had.
20814. Were you paid twice for any of the work? No; in fact I do not think we were paid sufficient measurement on the excavation on that particular contract. We accepted the original cross-sections for the excavation, and judging from the time it took us to do the work and the quantities we were paid upon, I am certain that we lost some thousands of yards of excavation.
20815. *His Honor.*] On what part of the excavation did you lose? There was an old creek running down there, and we had to widen and deepen this creek to get the work in. These cross-sections were taken every chain or so, some years before we got the contract, and the ground had altered in the meantime. I am positive that we lost some thousands of yards in the excavation.
20816. Was it open excavation work? Yes.

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20817. There was an earthen channel and there was a concrete channel also ;—are you now speaking of the concrete channel or the earth channel? I am speaking of the concrete channel. The earth channel was in swampy ground, and that had not altered. There was no original creek in the earth channel.
20818. What sort of ground was it? The earth channel was in nasty wet ground. It was soft, boggy, stuff—in fact I remember sending Chiene down one day to take cross-sections. He happened to step in between the reeds, and went in up to his middle. The men had to take up the stuff in buckets sometimes.
20819. Were you paid for all the flood water that went down there? We were not paid anything for the water, and there was plenty of it at times.
20820. So that if any one has said that you were paid for the flood waters that would not be correct? No; I wish we had been.
20821. Were you paid twice over for the excavation? No.
20822. Were you paid twice over for the filling? No.
20823. So that any statement to that effect would be utterly untrue? Entirely untrue.
20824. Do you remember the amount of that particular contract? No; I think it came to about £27,000 or £28,000 at the finish, but I do not remember what the tender was.
20825. Will you look at the schedule of Contract 72, which appears upon page 160 of the Parliamentary Return, and tell me how much the excavation there given is? The original probable quantities give 26,200 yards; the filling is given as 12,000 yards.
20826. What are the figures in the final certificate? 53,410 yards of excavation, and 27,961 yards of filling.
20827. How do you account for the great increase in the excavation and filling in the final voucher as compared with the probable quantities? I do not exactly know how it did occur.
20828. Does it look as if you were paid twice over? Some people might think so, but I know that it was not the case. I have often seen cases in which the quantities carried out were more than double the quantities given in the original estimate.
20829. *His Honor.*] If you came to think of the relation of the earth channel to the rest of the work would that enlighten you on the point? They may not have included the earth channel in the original quantities. I could not say for certain whether that was so or not, although I think that that omission was probably the reason of the increase.
20830. *Mr. Gummow.*] Do you know what the Government do in making up their schedules ;—have you any idea of how they make them up before you see the tender form? Not in the least.
20831. So that you could not speak as to that particular? No.
20832. Do you remember whether, when you were going to start that contract, there was an outlet for the concrete portion of the sewer? There was no outlet without cutting the earth channel.
20833. Were you then ordered to cut the earth channel? Yes.
20834. Have you any idea of what quantity of excavation, speaking from memory, there would be in the earth channel? About 20,000 yards.
20835. So that the addition of the earth channel to the concrete channel might make up the quantity upon which you were finally paid? Yes.
20836. In any case you are satisfied that you were not paid twice over? Not for a single yard. We were not paid for as much excavation as we did on that job—we lost money on it.
20837. Will you look at the item iron girders, as shown in the schedule, and tell me how many cwt. are shown? Seventy-four cwt.
20838. Will you look at the quantity in the final certificate and tell me what that is? 400 cwt.
20839. Can you remember how that increase came about? Yes; the work went through the Cooper Estate, and there was one place between two portions of swamp where there was a kind of peninsula of dry land. The original plan provided for the carrying of an open channel through that peninsula, and I think Mr. Buckland, the manager of the Cooper Estate, objected to having an open channel there. He wanted the place left so that he could have traffic across, and he would not allow the work to go on until the Government agreed to cover that portion of the work. We were ordered to cover it with iron girders and to fill in up to the level of the original ground.
20840. Was that the only reason of which you can think for this increased quantity? That is the only reason that I can imagine.
20841. You know of no other reason? No.
20842. The contractors did not ask the Government to put it there? No.
20843. Did the Government put the extra quantity of iron work there to please the contractors? Certainly not.
20844. Do you remember whether the Shea's Creek contract was stopped? Yes.
20845. Where was the end of the work at the time of the stoppage? Just about the junction of what we called the Macdonald Park sewer with the Shea's Creek sewer.
20846. Do you know the reason for the stoppage? I understood it to be because there was only a certain amount of money for the job, and that that money was exhausted.
20847. Can you remember the date approximately when the work was stopped? No.
20848. Did you ever go on with the work? Yes; some months afterwards. There was a long interval—I should say four or five, or perhaps six, months.
20849. Do you remember making a claim against the Government in respect of the stoppage of the contract? Yes.
20850. Had you anything to do with the getting out of the details of the claim? Yes.
20851. Do you recognise the document I hand you as the claim which was put in ;—do you remember anything about it? Yes; I think I made it up, and that Mr. Carter copied it.
20852. Whose handwriting is the document in? Mr. Carter's.
20853. Do you know whether you had any outside assistance in connection with the making up of that claim? Yes.
20854. Who helped you? Mr. B. C. Simpson.
20855. Do you remember whether, when you made up that claim, you had any cement in hand? Yes, we had an immense quantity of cement in hand. I could not remember how much now, because it happened a good many years back, but we had a large quantity of cement in hand.
20856. Is there anything which would bring to your mind the quantity of cement you had? The only thing

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thing I can remember is that we had some sheds full, and as more cement was coming in we had to get more iron in order to build more sheds to hold it.

20857. You remember that distinctly? Yes.

20858. Will you look at the claim, and tell me whether any reference is made in it to cement? Yes; there are two items having to do with cement—one item is 1,300 barrels, and the other 2,000 barrels.

20859. Would you have both of those quantities on the ground? More than that, I think. I believe we had between 4,000 and 5,000 casks upon the job.

20860. Do you know why it was then that you put in a claim of only 3,300 casks? I should say that that would be the estimated quantity required to finish the portion of the work in respect of which we were making the claim. We used to get in a good stock of cement and take it to the most suitable shed, and cart it from there round to the different works as required.

20861. You consider, therefore, that you had upon Contract 72, at any rate, the quantity required, if not more? I am certain we had more than that quantity.

20862. If you required only 3,300 casks to finish the job, how is it that you had so much more coming in? We bought rather much at that time.

20863. Did you buy for a particular contract or did you make a general contract to supply cement? Sometimes we used to buy more than we intended to use in anticipation of our getting other contracts. If the market was low we used sometimes to overbuy.

20864. Can you tell His Honor why you did not sell all this cement again when the job was stopped? I think we had other contracts going on. Carter & Co. had one or two other contracts.

20865. Is it a general practice with you to cart cement from one contract to another? Yes; we carted it from the Glebe to North Shore, from the North Shore to the Glebe, from the Glebe to Shea's Creek. It was moved about in all kinds of ways. We were constantly shifting cement backwards and forwards.

20866. What was your reason for that? We sometimes used to get in a larger stock of cement than we required at the time, and we did not know then the most suitable place in which to put it; or perhaps we had an available shed upon one job and not upon the job upon which the cement would be first required.

20867. Can you remember what became of the cement at Shea's Creek? Not all of it. I fancy we carted some to Waverley. I know that we carted a lot to North Shore, but I do not know how much.

20868. Can you say who carted it? Burcombe used to do all our North Shore work.

20869. Did anyone else cart there besides Burcombe? I do not think so.

20870. At any rate, you are quite sure that there was this large quantity of cement on the ground at the time? I am sure we had considerably more than is stated in the claim.

20871. With regard to the concrete, what sort of stone had you to use? The best sandstone. It had to be approved by Mr. Davis, and he was pretty particular about it too.

20872. Did you use any material in place of sandstone? Broken bricks were used at Shea's Creek.

20873. Do you consider that they would be as good for the concrete as would the sandstone? Better.

20874. Did they cost you as much to break? I think they cost us more to break than did the stone. The reason for getting the bricks, if I remember rightly, was that we could not get the stone fast enough.

20875. It was not done on the score of economy, then? No; I do not think so.

20876. Did you get just the common house-bricks or clinker-bricks? The reason the bricks could be got at the price we paid for them was that they had been burnt all to pieces and were useless for building purposes.

20877. Do you remember now who were the partners in that particular contract? I could not say from memory. On looking at the papers I see that the partners were Carter, Snodgrass, and Forrest.

20878. Do you remember who were the contractors for Contract 79? I do not remember exactly, but I have an idea that they were Mr. Carter and myself. I see from the papers that that is so.

20879. And not Mr. Forrest? No.

20880. Do you consider that if any dispute had arisen, or there had been any business transaction necessary as between the contractors and the department, that the department would have looked to Mr. Forrest in regard to Contract 79? No.

20881. What reason have you for saying that? Because they would not recognise him as a partner in the job.

20882. Have you any experience or knowledge which you think justifies you in giving that answer? Yes; in connection with condemned pipes, Mr. Hart, of the Standard Brick Works, complained to Mr. Davis about some of the pipes being condemned. He tried to argue the point, but Mr. Davis said he would have nothing to say to him in the matter as he was not the contractor.

20883. When you were in the employ of Mr. Pritchard you were manager and engineer? Yes.

20884. Was it ever hinted to you that you were not a contractor, and that the department could get you removed at any time because the names did not happen to show that you were a partner in the job? Yes.

20885. You are satisfied that the department would not recognise anyone but the parties who are shown in the particular contract? Certainly I am. They would not recognise anyone else unless a written authority were given.

20886. You say that you and Mr. Carter were the contractors for No. 79? Yes.

20887. Was there anyone else at all who was a partner in that contract? No.

20888. So that Mr. Gillan and myself had nothing to do with it? Nothing whatever.

20889. At no time whatever? At no time whatever.

20890. Had we anything to do with any of the contracts you have already spoken of? Nothing at all.

20891. Do you remember tendering for Contract 79? Yes.

20892. Do you remember who were the lowest tenderers? Bond and Hudson; we were second.

20893. Do you remember whether any objection was taken by you to Bond and Hudson's tenders being accepted? Yes; I objected to it.

20894. On what grounds? That they had refused to take up the contract upon which they had tendered before, and in connection with which they were the lowest tenderers. The departmental regulation said that, in the case of contractors refusing to take up a job after the Government had accepted their tender, they would be debarred from tendering, subject to the Minister's pleasure.

20895. Do you know what contract it was which Bond and Hudson had thrown up? Yes; the Woolloomooloo contract.

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20896. Who were the second lowest tenderers in the original tendering for that contract? I think Gummow and Gillan were the second tenderers, and that we were the third on the first tendering. On the second occasion of tendering Bond and Hudson were the lowest tenderers, Carter & Co. were the second, and Gummow and Gillan were the third.
20897. Do you consider that it was fair play to Gummow and Gillan to have the job re-tendered? I did not think so at the time, but I was pleased afterwards that it came out so.
20898. Do you remember, when it was found that Bond and Hudson's tender for 79 was the lowest, raising an objection to the acceptance of their tender? Yes.
20899. What action did you take? If I remember rightly, we saw Mr. Barling in his room, and spoke to him about it, and he said that we had better put our objections in writing.
20900. Why did Gummow and Gillan sign that letter of protest as well? I cannot say just now;—I do not remember.
20901. Had they anything to do with the contract, or was it any advantage to them to sign the protest, as far as any benefit they were likely to derive from it was concerned? Not as to that contract. They might have expected some ulterior benefit in future tendering.
20902. You bought Bond and Hudson off? Yes; after a time.
20903. Do you remember anything about the negotiations? Yes; I remember that we agreed to give them £750 down and a P.N. for another £750, upon the condition that we got the contract. We agreed to give them that amount if they would throw up their tender.
20904. Did you know that you were going to get the job when you made that offer? No;—in fact, after completing the arrangements, Mr. Carter and I went to the "Australia Hotel," and I remember saying to him "This looks like a bit of gambling. It looks like the tossing of a coin for £1,500."
20905. Did you make up that tender for that contract? Yes.
20906. Did you fix the schedule yourself? Yes.
20907. Did Mr. Carter have anything to do with it? Nothing whatever.
20908. Did you get any assistance from the department in making it up? No; I do not see that they could give me any assistance.
20909. You consider that you know more about the making up of tenders than does the department? Yes; more than any man in the department.
20910. How did you come to put such a price on soft ground excavation? I had an idea that the quantity would turn out to be more than the Government estimated it at.
20911. Did you put down any bores to test the ground? Yes.
20912. And that was a better indication than you could get from the department? Better than I could get from the plans, certainly.
20913. And on the strength of putting down the bores, you fixed your prices; is that correct? Yes.
20914. Do you know a man named Reid who was an inspector on that job? Yes.
20915. What sort of man was he? He seemed to act as if his idea of his duty was more in the direction of trying to get the men to do bad work than to prevent them from doing it. He seemed to me to try to induce the men to do bad work so that he might be able to report it.
20916. You have found inspectors do that kind of thing? Yes, more than once.
20917. They prefer, you mean, to get the contractors into trouble if possible than to get good work done for the benefit of the country? Yes.
20918. Do you remember Reid's complaining while he was on the North Shore contract? Yes.
20919. Do you remember his once complaining about a chip off a brick? Yes. He complained about a brick being put into the work which had a chip off it about the size of three peas.
20920. Is that the usual kind of complaint he would put in? Yes; that was Reid's usual style.
20921. Do you remember once offering him a drink? I cannot say that I do; I may have done so twenty times, but I should not be likely to remember things of that kind.
20922. You like a drink yourself now and again, do you not? Yes.
20923. Are you sociably inclined? Yes; too much so, I dare say.
20924. So that it is likely that you did offer Reid a drink? Yes. I suppose there is hardly an inspector who ever worked on our jobs that I have not asked to have a drink.
20925. Did you ever shout for the men? Yes, a number of times.
20926. Do you ever remember taking the men over to an hotel—the "Queen's," I think—and their coming back with some bottles under their arms and going into the engine-room and having a few drinks and songs together? Yes, I can remember that.
20927. It was about Christmas time, was it not? I do not remember now.
20928. It was not an unusual thing for you to do—to shout for the men? It was quite a common thing.
20929. Can you tell His Honor the reason why you were so anxious to get the North Shore contract and why you offered Bond and Hudson the money you did? I thought, from the way the schedule was arranged, that we would make a good profit out of it.
20930. Had you much cement in hand at the time? A lot of cement. We must have had between 4,000 and 5,000 casks.
20931. Had you much hoisting plant in hand? We had four winding engines, and the contract only required seven.
20932. Where were these? At Waverley.
20933. Was that job nearly finished? Yes.
20934. *His Honor.*] You had deep shafts and hard ground at Waverley? We had hard ground, and the shafts were about 200 feet deep.
20935. *Mr. Gummow.*] Do you remember Mr. Davis writing to you to inform you that you had to gutter and gad out the whole of the contract? Yes; and I strongly objected to it.
20936. On what ground? That it would cause the deaths of a number of men.
20937. Do you consider that it endangers the health of the men? I consider that it endangers their lives. I reckon that I have had thirty men who have died on my hands and have not done half a mile of guttering and gadding.
20938. You consider that guttering and gadding is much more dangerous to them than the shooting? It is a hundred times more dangerous. I reckon that any man who works constantly at guttering and gadding for twelve months will not live for three years.

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20939. What happens to him? Well, I am not a medical man, and it is rather difficult to answer the question. But I know that the men appear to contract a disease, which resolves itself into a form of consumption. They get gradually weaker and weaker. They get less and less breath, until they are not able to walk up the slightest hill. Finally, they lie down and die. It used to cost us a good few pounds to keep them going—that is, to keep them alive. They used to come down to us at the works, when they were able, and get some help from us. Besides giving them money ourselves—Mr. Carter generally used to do that—we used to get up subscription lists and collect money from the other men; we heading the lists ourselves.
20940. Did you raise this objection to guttering and gadding when the department wanted the work carried out in that way? Yes.
20941. Did you get out a list of the names of men who had died through the effects of guttering and gadding? Yes; the list was shown to Mr. Hickson and Mr. Davis.
20942. As to the ventilation of the tunnels—taking the North Shore Contract, for example—how did you arrange with your men about that;—what was the method of procedure? I gave them the machinery—that is, the winding engines—which were driven by steam. I fixed the fan and the pipes down the shaft and the men themselves used to fix the pipes as they drove the tunnels.
20943. Who blew the air? The engine drivers.
20944. That would be where you had engines; but what was done where you had no engines? We fixed a hand fan, and the men used either to blow air themselves or hire a boy to do it. They would generally hire a boy.
20945. It was part of their contract then? Yes.
20946. You had nothing to do with that? No; I used merely to fix the fans and the pipes down the shafts. The pipes in the drives were fixed by the men themselves.
20947. So that if the men failed to do that it was their own fault? Yes.
20948. Do you remember having in your employ a man named Jack Reid? Yes.
20949. What was he? Walking ganger, I presume, would be the appropriate term for him.
20950. What sort of man was he as regards looking after the work? He was a pretty good man; very attentive and trustworthy.
20951. Did he take a glass at any time? Yes.
20952. Have you anything to say with regard to him? No; I do not know that I have.
20953. Do you remember a man named Dawson, a bricklayer's labourer? I remember that there was a bricklayer's labourer named Dawson, but I should not know him if I met him in the street now.
20954. Was he a good man, do you know? I suppose he must have been a pretty good bricklayer's labourer or he would not have been with the gang. As a rule the bricklayers' labourers were considered amongst the best men on the works.
20955. You paid them well? We paid them higher wages than we paid the average run of men.
20956. Had they heavy work to do? Yes; I suppose theirs would be as heavy work as any on the job.
20957. Do you remember getting Contract 79A? Yes.
20958. How did you get it? From the Minister without tendering for it.
20959. Was it a tip-top job which if put up to tender would have gone from 20 to 40 per cent. less? I do not think it would have gone 5 per cent. less.
20960. Was it given to you upon your original schedule for Contract 79? No.
20961. Upon what schedule did you get the work? Upon a schedule made up by the department.
20962. Do you remember the contract you had at Marrickville? Yes.
20963. Did you make up the tender for that contract? Yes.
20964. Did anyone besides yourself see the tender before it was put in? No one, with the exception of Jack Reid, saw it. He checked the additions.
20965. Did Mr. Carter see it? No.
20966. Did I see it? No; I think you were in Adelaide.
20967. You made out the tender upon your own idea? Upon my own responsibility entirely.
20968. Did Mr. Carter know the amount which was put down in the schedule before the tender was put in? No; he did not know what the total amount was until I asked him for a cheque for our preliminary deposit.
20969. What did Mr. Carter do in these matters? He looked after the financial business, buying the material, paying the men, and things of that sort.
20970. Is he anxious about the profit? Sometimes when we were putting in a tender he would say "How much have you put in for profit?" I would tell him, and he would then sometimes say "That is not enough, is it?"
20971. Is that all he troubled himself about? That is all.
20972. Will you look through the schedule of 69 and explain to His Honor any points which you consider require explanation or any points which His Honor would like explained. Take, for instance, the first four items;—how did you come to put them down at the one price? I thought that all those quantities would turn out considerably less than shown, and, instead of actually putting down the actual values opposite to them, I put in a low price, and carried the difference on to some items which I thought would probably be increased. That is the common way of making up tenders under conditions such as those upon which this job was tendered for. The first four items I thought would be considerably decreased. The next item—No. 5, soft ground excavation—I thought would be increased. The next three items I thought would be increased, and I put a good price opposite to them. The next three items—9, 10, and 11—are practically one, and the same thing applies to them. As to items Nos. 12, 13, 14, and 15, it seemed to me evident that they would be decreased, and therefore the price is small. Item No. 16 I thought would be considerably increased, so I put a very large price opposite that. The next items—17, 18, and 19—I thought would be decreased. Of course I am speaking from the prices I see here now. I cannot speak definitely from memory of what I thought at the time, because it is some years ago since this thing happened. The next item, No. 20, I expected would come out at somewhere about the quantity shown. The next item is one which requires no price at all, but the tender would have been informal if we had not put in a price. That item depends upon the quantity of soft ground tunnelling, for which I had allowed a pretty liberal price.
20973. *His Honor.*] That would cover the timber? Yes. The next item is a matter of indifference; it

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is only a small quantity. I come now to subducts. The specification provides that the subducts have to be cut out, and the quantity excavated is paid for in tunnel work, so that that pays for the subducts. No price for them is therefore necessary.

20974. You had a good price for excavation? Yes. If you allow a good price for excavation you have a good price for subducts. That applies to items 23, 24, 25, 26, and 27. I do not think I need go through the whole of these items, but coming to item 34, cement rendering, that is an item I expected to be considerably increased. Unfortunately for us, we fell into the mud over that.

20975. *Mr. Gummow.*] What were the grounds of your expectation? I took out the quantities, and, according to my idea, there would be about 15,000 yards of rendering, but it turns out that there were only 10,000. We received instructions from the Government not to render the brick arches. I had made up my estimate, including the rendering of the brick arches, and I thought about 15,000 yards would be required. I thought we were going to get a good plant out of that item, but it did not come off.

20976. What have you to say about item 36? The probable quantity given in the schedule is 12 cubic yards, but I estimated that from 34 to 36 cubic yards would be required, and I put down £50 a yard.

20977. As to items 33 and 34, what have you to say? As regards those items, we put down, as a rule, a small price, because we reckon that the price for excavation includes the removal of surplus spoil.

20978. Have you anything to say as to items 46 to 82? We got a tender from Mort's Dock for the supply to us of all our ironwork, and we added some £40 or £50 for our own trouble.

20979. With regard to the item for guttering and gadding in hard sandstone, when you made up this tender, had it been the practice of the department to make you do guttering and gadding? It was only done in case of necessity.

20980. What do you mean by that? Cases were it would be dangerous to important buildings over the sewer to blast.

20981. With regard to the surplus material, had you to remove all surplus material yourselves on these contracts generally? No; very often we got paid for the stuff. Persons would come and ask us to let them have some stuff, and we charged them so much a load for it.

20982. Do you at times let them take it away for nothing? Yes; in fact, on that very job we arranged with the Marrickville Council to take the rubbish away. We give them whatever we can spare of the good stone, providing they cart the rubbish away. [*Vide Appendix No. 80.*]

20983. As to the extra quarter of a mile lead, what do the department do with regard to that, as a rule? They generally say that they will let you do what you like with the stuff, allowing half a mile lead.

20984. This penny for every quarter of a mile extra is not often paid? Very seldom, that I know of.

20985. The excavation, as a rule, is close to the temporary spoil bank? Yes; I do not know of a case where it has been necessary to remove it from the spoil bank. I have seldom seen in the final certificate any item for extra lead.

20986. Supposing you are allowed to leave the stuff on the ground, are you paid anything then? For the first half-mile lead.

20987. What have you to say about the bluestone pitchers at £50 a square yard? I suppose that the whole of that item, less the cost of putting in the pitchers, would be profit. We do not work for nothing. We expect to get some profit out of it.

20988. You cut down other prices to allow for that? Yes.

20989. So as to bring your total lump sum down? Yes.

20990. As to the payment for these bluestone pitchers, do you remember having any dispute about them; do you remember anything arising in connection with them? Yes; Mr. Davis said the item would be cut out altogether, that we should not get anything for it; but I said the department could not do that.

20991. What action did you take then? When Mr. Davis refused to put the item in the certificate, Mr. Carter and I went to Mr. Hickson about it. At first he said he did not think we had a right to get paid for it; but, after reading the specification, he said that he did not see how to get out of it, and the Government would have to pay for it, but that he would pay only for the quantity shown in the approximate quantities. Then I pointed out to him that the quantity shown there was mentioned as being only approximate, but that the work was to be paid for according to the quantities as actually executed. He then said that the work would have to be paid for, but that he would not order any stone to be put round manholes where it could be avoided; that the stone would have to be put in where shown on the plan, but that he would not order any to be put in in any case where it was not so shown.

20992. *His Honor.*] What did you say to that? I was satisfied. We put in the pitchers where they were shown upon the plan, and got paid for them.

20993. *Mr. Gummow.*] Did you not put in any more than were shown upon the plan? No.

20994. *His Honor.*] Did you not finally, under Mr. Darley, put in a few more than were shown upon the plan? Not to my knowledge, at any rate.

20995. *Mr. Gummow.*] Do you know a man named Darcus, a carpenter? Yes.

20996. Was he a foreman? No.

20997. Had he charge of any men? No more than a carpenter would generally have with a concrete gang. The carpenter fixes the ribs, and he will tell the men how the lagging and things should be put on, but he has no authority over them.

20998. Has he anything to do with ordering them in their work, or telling them what concrete is to be put in? No.

20999. Did you have to appeal to him when you wanted to know anything about the engineering on the carrying out of the work? Hardly.

21000. You were quite capable of doing it yourself without his assistance? Yes; I taught him a good deal of what he knows now about sewerage work.

21001. Where? On the Rushcutters' Bay contract.

21002. He was under you there? Yes. He knew scarcely anything about the work then. He did not know how to make a common rib for an ordinary sewer, and I taught him how to do it.

21003. You were his boss, were you? Yes.

21004. Do you remember any sewers being altered from a duplicate to a single sewer? Yes; on the Marrickville contract.

21005. Can you remember whether any ribs had been made for the duplicate sewer? Yes; a number of them. I forget now how many.

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21006. Do you remember going to Mr. Davis, with regard to the making of these centerings? Yes. I objected to an alteration being made in the design without our being paid for the work we had already done upon the original plan. It was thereupon agreed that we should get paid for making the ribs.

21007. Do you remember what they cost, roughly? I have no idea. As far as I can recollect, I told Darcus to make up the cost of the ribs.

21008. Did you suggest to him that he should charge 500 per cent. more than they were worth? No; I told him to make up all the timber and iron and his own time.

21009. As a matter of fact, what did you think of Darcus himself while he was in your employ? He was a thoroughly good tradesman, but an interfering fellow.

21010. Did you engage him? Not at Marrickville. If I could have helped it—I could have helped it in a way, but I should probably have had a dispute with some of my partners had I objected to his being on the works—I would not have had him there.

21011. He was not a particular friend of yours;—he was not a person to whom you would trust your confidence, supposing you intended to work some little swindle? No, certainly not.

21012. At Question 2202 you will find that Darcus gave this evidence:—

What did Mr. Snodgrass tell you to do? He expected me to put on about twenty times the amount.

I said, "That is the correct thing; you can do the rest."

? That is a lie.

21013. Do you remember measuring up the Premier-street shaft chamber? Yes.

21014. What sized chamber was it? A good big chamber. It was hardly as big as this room, but it was somewhere near it.

21015. Do you remember taking the cross-section in connections with it? Yes. We had rather an awkward job. The ribs were set for the concrete work, and it was hard to get at the measurement. Mr. Gibbs and I went out to measure the work up together. If I recollect rightly, Darcus did the measuring, and Mr. Gibbs and I put the figures down. Darcus had to measure off the ribs. He had to climb about all over the place, but I told him to do the best he could. We put the measurement at specified places all round the ribs. Darcus got a stick, and put it up from the ribs out to the rock.

21016. Did you take cross-sections in the usual way? Yes, as is always done.

21017. Had you your ribs set up at specified places? They had to be set up in specified places, in accordance with the design for the concrete.

21018. Did you take measurements from each rib? Measurements were taken from each alternate rib, if I recollect rightly. I asked Mr. Gibbs where he would have the measurements taken, and it was he who suggested each alternate rib.

21019. So that whatever was done in the measurement was done with the sanction of the department? Yes.

21020. You took the measurements regularly at specified distances? Yes; we arranged to take a certain number round a half-circle. I forget what the number was now, but I think it was five or six, and we took the average from those. The measurements were all taken at the same angle of the ribs, to whatever point the rock would come to. We might have gained or lost by it, but it seemed to us to be the fairest way of doing the work. It was not an exact measurement, but it was the nearest approximation we could get.

21021. Did you pick out the big holes when measuring? No; we took them in radial lines, as they came.

21022. If Darcus has stated that you told him to do the best he could, would that mean that he was to take all the big holes? No. If I said it at all, what I meant, I suppose, was that he could do the best he could in climbing about the ribs, because it was an awkward place to get at. He was talking about making stages for the measurement, but that would have taken about half a day at least, and Mr. Gibbs would not have waited. The work would probably have had to stand over for two or three days longer.

21023. Was there any inspector there? Yes; I think Tudgay was there, and wherever he could get up on to the centering he checked Darcus in his measurements. He had a candle, so that he could watch where Darcus was holding the stick, to see that he did not overstep the mark.

21024. If you were taking the sections of the chamber again, as a Government officer or inspector, would you consider that you were taking the fairest course to obtain an approximate measurement if you repeated what you did on the occasion to which you have just referred? I daresay we might have got a little closer by taking sections at each rib instead of at alternate ribs. Anyway, we got a close approximation.

21025. Did you consider it a fair approximation for both sides? As far as we could get it. I could not tell whether we gained or lost by it.

21026. Do you remember the iron pipe laying down there? I saw a little of it.

21027. Could you say anything with regard to that work, as to whether it was properly done? On several occasions I was down with Mr. Griffiths when they were laying pipes. I thought they were putting in thoroughly good work, and Mr. Griffiths thought so too.

21028. If, in the laying of the pipes, you came across a gas or water pipe which had to be removed, who would have to bear the expense of removing it? The Gas Company if it were a gas-pipe, and the Water and Sewerage Board if it were a water-pipe.

21029. The contractors had nothing whatever to do with the expense? No.

21030. So that the removal of the pipe did not make any difference to them? It made a difference to them in this way—that if they came to a pipe which was unanticipated they might have to knock off their men for a day or two.

21031. But they would not have to pay for the removal of the pipe? No.

21032. So that if any method was adopted by the department of getting round, over, or under a pipe, it would not be a saving to the contractors? No; that was done on several occasions where pipes came across the middle of a shaft. The shaft in those cases has been removed a foot or two to allow of the work being carried on without altering the pipe.

21033. Do you remember Emily-street, on the Marrickville contract? Yes.

21034. Do you know what the packing over the top of the brickwork was done with in that case? Shale.

21035. Why? Because it was considered good enough for the work. We were ordered to do it with shale.

21036. Were you paid for it as concrete? We were not paid for it at all.



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21037. Why? We only had 1s. a yard for it, and the quantity was so small that the trouble of making it up, it seemed to me, was greater than the value.
21038. You got paid for it as surplus at 3d. per yard? Yes.
21039. Do you remember the Monier arch work in Contract 77? Yes.
21040. Do you remember who made up the schedule in the case of that contract? I made up the schedule both for the Government design and for the Monier design. If I recollect rightly, you went over the schedules before they were finally sent in. I am not sure about that. I am sure, in any case, that I made up the estimate for the departmental design upon my own responsibility.
21041. What did you make it off? The specification, I think.
21042. That is with regard to the departmental design? Yes.
21043. But with regard to the Monier design? Mr. Baltzer had made a design—in fact, he was nearly being late with it. He had scarcely got it finished when it was time to put the tender in.
21044. Do you remember making up the tender for the departmental design? I have a slight recollection of it, but I cannot remember the particulars.
21045. Were you prepared to go on with it at the price at which you had tendered? Yes; we would have gone on with it if our tender upon that design had been accepted.
21046. Would you have made any money upon it? We should not have lost money, but we should not have made any. We might have made £100 or £200, but I am sure that we should not have lost.
21047. Do you remember telling anyone that if the department had accepted your tender upon the departmental design you would not have gone on with the work? I cannot remember saying it, but I may have done so. If I did say so, it would probably have been to some rival contractor.
21048. You think you may have said so to someone? Yes, it is very likely.
21049. For what reason would you have said it if you really had no intention of refusing to carry out the work? It was only a bit of bluff.
21050. That is quite a usual thing with you? Yes; I think, if I remember rightly, I have done the same thing with you when we have been tendering against one another.
21051. Is it not the practice among a number of contractors to try to pump one another when they meet in the street—is it not a little way they have got? Yes.
21052. I presume you do not tell everyone what your business is? I do not.
21053. Do you know a contractor named Thomas Williams? Yes.
21054. Did you ever tell him that if your tender upon the departmental design for Contract 77 had been accepted by the Tender Board you would not have taken up the work? I cannot remember telling him so, but it is quite possible that I may have done so.
21055. What was the object you had, supposing you said such a thing to him? Mere bluff.
21056. Did you ever tell him, in reference to the bluestone pitchers, that you saw the schedule of quantities before it was printed, and that you had it fixed up to suit yourselves? No. I never in my life saw a departmental schedule of quantities before it was printed.
21057. Had you the run of the Government offices in any way, so that you could get in to see all these things? No.
21058. You are quite satisfied that you have never seen the MSS. of schedules before they were printed? Never once.
21059. And you did not tell anyone that you had seen them, and that you had got them fixed up to suit yourselves? No.
21060. Can you recognise the handwriting on the document I hand you? It is your own, I believe.
21061. Look at it again;—do you think it is my handwriting? Now I come to look at it, I think it is Norman's, but it does not look like his writing either.
21062. Can you recognise any of the prices, and do you know where Norman or anyone who wrote the document would have been likely to get them? They might have got them from an estimate I made up.
21063. Can you recognise the document in any way, either as to prices or quantities;—is there anything on the face of it which brings it to your mind as being a copy of your estimate? I can remember the prices I put in for the tunnelling and the sandstone concrete on the Monier contract. I remember those prices, right enough.
21064. Where was I at the time you made up that estimate? I fancy you were in Adelaide, but I could not say definitely.
21065. Is the document I have handed you a copy of your own estimate? Yes; it appears to be a copy of my estimate.
21066. Do you remember whether I agreed to it? I am certain that you agreed to it before we put it in.
21067. What price had you there for mortar? 70s.
21068. Do you consider that a fair price to put down for mortar? It is just about a fair price. I do not think it can be done for many shillings less.
21069. Can you remember the price you put in for the departmental design? No; but I think it was some £600 or £800 more than our price for the Monier design.
21070. Do you remember the percentage below the Government schedule for the departmental design at which we tendered? It was 28½ per cent. below, I think, but I am not quite certain.
21071. The price then would amount to £15,757? Very likely.
21072. What was the price of the lump-sum tender? £15,500, I think.
21073. How did you arrive at that £15,500? We made up an estimate of the probable cost—£14,677, I think, it came to—and we put in the difference as profit.
21074. Why did you fix upon the £15,500? We wanted to have our tender upon the Monier design below our tender on the departmental design.
21075. And you say you put in your tender upon the other design at cost price? Yes.
21076. What was your object in tendering at cost price;—did you not want any profit? We had an idea that if we could do the work for less upon the Monier system, and if it could be made as efficient a job, the department would accept the design.
21077. Had you any reason for knowing that they would? I think the Minister for Works said that, providing the Monier system could be carried out efficiently at a cost cheaper than could the departmental design, he had no objection to it.
21078. Did he tell you that? No.
21079. Where did you get that knowledge from? Mr. Carter told me.

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21080. That the Minister was willing to accept the tender upon the Monier design? That he was willing to consider our design—that if it proved to be as efficient as, and cheaper than, the departmental design, he would take it into consideration anyhow.
21081. Do you know the regulations for tendering? Yes.
21082. Do you know that the department could throw out a tender which was not sent in upon particular lines? Yes; that was the reason, I take it, why Mr. Carter went to the Minister beforehand. He wanted to have the thing under consideration.
21083. Do you remember if the probability was discussed by Mr. Carter, yourself, and myself, as to whether, if we were not the lowest tenderers for the departmental design, the Monier design might not be looked into? Yes; I remember that distinctly.
21084. Do you think that that idea had any bearing upon our putting in our tender upon the departmental design at cost price? That was the sole reason.
21085. You say you would have been quite prepared to go on with the departmental design if the department had refused to accept your tender upon the Monier design? Yes.
21086. Do you remember who tendered for the Monier design—who were the parties who tendered upon it? Mr. Carter, Mr. Gummow, and Mr. Snodgrass.
21087. Do you consider that the department looked to Mr. Forrest and to Mr. Gillan in connection with that contract? They had no power to look to them under that tender.
21088. Did they make you sign as Carter, Gummow, and Snodgrass, individually and collectively? Yes.
21089. You did not sign as Carter, Gummow, & Co.? No.
21090. Each party, then, would be responsible to the department for the contract? Yes.
21091. And in that case the department could not look to Mr. Forrest or Mr. Gillan? Certainly not.
21092. Do you know whether in any contract with which you were connected, as a member of the firm of Carter, Gummow, & Co., in New South Wales, Mr. Gillan's name is shown in the departmental papers;—did he sign any of the papers, do you know? No; I am pretty sure that he did not.
21093. Do you know whether Mr. Forrest signed with Carter & Co. after the Shea's Creek contract;—did he sign for Contract 79? No; I do not think so.
21094. If he did not sign for that contract, would the department have any right to look to him in any way? Certainly not.
21095. Did you consider that when the names of Mr. Forrest and Mr. Gillan were sent in as sureties? Yes; we discussed that matter.
21096. And you considered that the department had nothing whatever to do with them? Nothing whatever.
21097. Do you know what sand was used in the Monier work upon Contract No. 77? Up to the time I left Sydney the sand was being brought over from North Shore. There were some hundreds of yards in a heap ready for use at the time I left Sydney. We got North Shore sand specially, because, on testing it, we found it the best sand we could get for the Monier work. We considered that the price was no object, so long as we got the very best possible material.
21098. As regards that particular work, the firm was determined to get the very best possible article? Yes.
21099. Do they consider the cement? Yes; they considered the cement for a long time, and they determined, for the Monier work, to get Germania cement.
21100. Do you remember Contract 118, at Johnstone's Creek sewer? Yes.
21101. Did you make up the tender for that? Yes; by myself, I think.
21102. Do you remember walking over the ground with me? Yes. I remember thinking that the tide was in at the time, but it turned out afterwards that, instead of what I saw being the tide, it was the Government pumping sand and water from the harbour over the breakwater and filling the whole place up.
21103. Do you remember speaking about the drainage of this water from the work during the time you were managing partner there? Yes; I remember saying to Mr. Carter one day that I thought it was not reasonable that we should have to keep pumping water out while the Government were pumping it in, and that their doing so would almost give us an action against them.
21104. Do you remember what course was taken? I think Mr. Carter went into the office, and saw Mr. Hickson. At any rate, Mr. Hickson came out, and, as soon as he saw what was being done, he said that that sort of thing would never do, and that the drain should have been cut some time ago to allow the water to drain away without carrying away the silt that was being pumped up for the reclamation.
21105. Did he make any concession to us in cutting that drain? No, decidedly not; because he had no right to pump water on to our works.
21106. Do you remember what the Johnstone's Creek sewer was built of? Sandstone concrete.
21107. Do you remember obtaining the sandstone for that contract? Yes.
21108. Were you given any trouble in connection with it? I went to a quarry in the neighbourhood, and got a quotation for stone which was guaranteed to come up to the Government standard. When I was prepared to go on with the work, I went round and told the quarrymaster to start sending us the stone. He had agreed to supply it at 1s. 6d.; and he said, if I recollect rightly, that he would send some in at once. I think I said to him "Put on as many carts as you like. You can cart it in as fast as possible." After waiting three or four days, no stone came, and I went to the quarry to see what was the matter. The man then said that he could not supply the stone at the price he had agreed upon, and he wanted 3d. a yard more. I said "I will not give the job to you at all." I then looked all round the country, and I finally hit upon Ryan's quarry. His stone had been used for different sewer work, and had passed the Government test. I agreed to take it at 2s. a yard, a higher price than that for which the man in the district had offered to supply the stone.
21109. What was the reason for that? I thought the first man was trying to take an advantage of me. He offered me the stone, in the first place, at a fair price, and he afterwards thought that we should be forced to deal with him; that he had us under his thumb. I preferred to give a higher price for the stone, and to be independent of the man.
21110. You did not pay the higher price because the first stone you agreed to get was not good enough? No.
21111. Did you get the whole of the stone required from Ryan's? No; from various quarries.
21112. How was that? We used to get a man named McMillan, who had a number of carts, to supply the stone; but he could not get enough at Ryan's quarries, and he therefore went to other quarries where the stone was up to standard.

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21113. Do you remember a man named Flood? Yes; he supplied a lot of stone.
21114. Did he supply it cheaper? Yes; I think he did.
21115. Do you know where he got it? At a quarry in Annandale, I think.
21116. Do you consider that it was as good stone as the other? It was just about as good. It was stone which had been passed by the Government more than once. It came up to the required standard.
21117. Were you always particular to watch that the people who delivered the stone gave you a material which was up to the Government standard? Yes; because if inferior stone came in, it caused us a lot of bother.
21118. Did you then get stone cheaper than the stone originally ordered from Ryan's quarry, on account of the stone's being an inferior stone? No; all the stone was up to the mark.
21119. Do you know whether the quarries in the neighbourhood came down in their prices when they found that you were independent of them? Yes; they then offered to supply the stone for less money.
21120. Had you anything to do with the building of the Monier arches? No; except the building of the ribs.
21121. But you had nothing to do with the building of the arches themselves? Nothing whatever.
21122. In purchasing a material like cement, do you purchase it at your own risk, or at the risk of the merchant? At the risk of the merchant. We buy it subject to its passing the Government test.
21123. And if it does not pass, what then? The merchant has to pay for the carting out to the work and the carting away again. I remember that we have sometimes given the cement-carters a hand in loading when cement has been condemned, and we have charged the merchants with the men's time.
21124. Do you remember a culvert being built on the Parramatta Road, near Strathfield? Yes; on the Monier system.
21125. Did it collapse? No; but it was not well put together. The men who built it did not understand the system, and carried out the work very badly. About eight days after the first half was built I was informed, however, by the foreman, a man who was working under the Government on day-work, that a 22-ton waggon passed over it.
21126. Did the work collapse? No; there was not a sign of fracture.
21127. And you never heard of it's collapsing? No.
21128. Yet you do not consider that it was well built? No; the mortar was badly put round the iron. I made a man cut off a lot of it one day while I was there.
21129. As to the question of books, do you know what books the firm ever kept? Carter & Co. never kept any books whatever, and I do not think Carter, Gummow, & Co. kept any either.
21130. How did they keep things going? I think they relied upon their bank pass-books.
21131. How did you pay the men? We had pay-sheets, and we put paper-fasteners through each fortnight's sheets and stuck them in the pigeon-holes while the job was in hand. When we had finished the contract we used to burn the papers in connection with it.
21132. As to dealing with the merchants, how did you do that? We either paid cash or P.N.s., and when the P.N.s. became due they were met.
21133. You really kept no ledger? No.
21134. Did you always meet all the bills and payments you had to make? Yes.
21135. With regard to the connection of young Mr. Hickson with the firm, do you remember anything about his first employment by the firm? I was down in Adelaide, giving you a hand with the carrying out of the work there. I could not stop there myself, and young Mr. Hickson came down. I had to come back here, and Mr. Hickson went down there to assist you in the alignments and levels.
21136. You yourself had nothing directly to do with the employment of young Mr. Hickson? No.
21137. Who employed him? Mr. Carter.
21138. How long do you think you were in Adelaide assisting me? Three months.
21139. Had you other duties to perform here? Yes.
21140. So that you could not be kept down there? Certainly not.
21141. Did you consider that young Mr. Hickson came in your place to assist me? I daresay you could have done the work yourself, but, as I often told you, I did not see why you should graft night and day to do work when we could afford to pay for assistance.
21142. As a matter of fact, were you and Mr. Carter not always speaking to me about doing more work than I should do? Yes; I would often say to you "Why do you not get someone else to make up the pay-sheets instead of messing away your time at that?"
21143. It was a standing joke between us that I did more work than I need do? Yes.
21144. After young Mr. Hickson had been to Adelaide he came up to Sydney, did he not? Yes.
21145. Do you remember his employment by the firm in Sydney? Yes; I had him with me on the Johnstone's Creek sewer, taking cross-sections and levels.
21146. Did he do his work properly? Yes; he was sometimes a bit slow, but I think he was fairly accurate and efficient. I have had worse engineers working with me than young Mr. Hickson.
21147. Do you know what salary he got? Yes; £4 a week for a considerable time, and then his salary was raised to £5.
21148. Do you consider that he earned his salary? I should not like to do the work he did at Johnstone's Creek for £5 a week.
21149. You do not know what his duties were in Adelaide—you had nothing to do with him there? No.
21150. Do you know of any telegram or letter being sent down there as to young Mr. Hickson's connection with the firm? There was none that I know of.
21151. Was he ever a partner in the firm? Certainly not.
21152. Had you any idea of taking him into the firm as a partner? No; and I would not hear of anyone else doing so either.
21153. Not in any firm with which you were connected? No.
21154. So that there is no foundation for the report that that was to be done? No; and I do not see how a report of that sort could arise. I do not know of any idea on the part of any member of the firm of taking him as a partner.
21155. Did he get anything beyond his salary? I believe he got three months' screw in lieu of notice.
21156. Where did you hear that;—were you a member of the firm at the time? I think I heard it before I went away to New Zealand.

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21157. Do you know of your own knowledge that young Mr. Hickson got that? No.
21158. You did not give it to him yourself? No.
21159. You simply heard that he got it? Yes.
21160. It was not part of your money? No.
21161. You severed your connection with the firm at the end of last year? Yes.
21162. You are no longer a member of the firm of Carter, Gummow, & Co.? No.
21163. Do you remember Mr. Bagge? Yes.
21164. You knew him when he was in the department? Yes.
21165. Do you remember, after he had been retrenched, hearing anything about him? I remember meeting him at Rushcutters' Bay one day, when he spoke to me about starting a poultry farm, and asked me about a carpenter. I think he also said something about getting the material. I told him of the name of a carpenter I thought would suit him very well. I am not quite sure now whether he asked me or whether I offered to buy the material for him. Anyhow, I did it upon my own responsibility. I did not suppose that any member of the firm would make any objection. I afterwards purchased the stuff for him. It came to about £170 as nearly as I can recollect.
21166. Did you make any profit out of the transaction? No; we merely handed on the invoices we got from the merchants. It was only a friendly transaction.
21167. It was not a business transaction at all? No.
21168. What did you do it for then? Well, Mr. Bagge was an old man. He was out of a billet, and I do not think he was too wealthy; and I thought I might save him a few pounds if I bought the stuff for him. If he himself had gone to the timber merchants I thought it possible that the merchants might charge him a high price for what he wanted. As we were dealing in a large way, of course we could get the stuff wholesale.
21169. Did he ever, while he was in the department, do you such a good turn that you should have been so kind to him afterwards? I do not think he ever did me a good turn.
21170. Did he ever do you a bad one? Yes; in a way, I think he has done so.
21171. Do you know whether he had any prospect of getting ready money? He had a retiring allowance which he expected to get, and I said it was on the strength of that that I would get the stuff for him.
21172. Do you think he himself had any credit at all? I do not think so.
21173. You thought it would be easier to order the stuff for Mr. Bagge than to listen to him, telling you what stuff he required, or asking you to assist him in ordering it? Yes; I thought it was much better that he should make up a list, and give it to us to send on. Mr. Bagge is very deaf, and he is a very hard man to talk to.
21174. Do you know Mr. O'Hanlon? Yes.
21175. What was he when you knew him? An engineer in the department.
21176. Do you remember whether he was on any of your contracts? Yes; on the North Shore contract—60, I think, was the number.
21177. Do you remember his getting married? Yes.
21178. Do you remember whether Mr. Carter gave him a wedding present? Yes; I think it was three spirit bottles in a stand.
21179. Do you remember assisting Mr. O'Hanlon in the same way that you assisted Mr. Bagge? I remember Mr. Carter coming to me and telling me that he was going to lend Mr. O'Hanlon some money. I was not asked to do it.
21180. Do you remember assisting Mr. Rudolph? It happened, I think, in the same way. Mr. Carter did it. He did not ask my permission, or anything of that sort. He did it "on his own."
21181. You knew of it? Yes.
21182. Do you remember a transaction with Mr. Weedon? Yes.
21183. Had you anything to do with that? No, I was not spoken to about it.
21184. As to the concrete work—do you know what the quantities are in the mixing of bluestone concrete? Sixteen feet of stone, 8 feet of sand, and a barrel of cement.
21185. Do you know what the mixing of bluestone concrete will make, speaking roughly? From 21½ feet to 22 feet.
21186. And what will the mixing of sandstone concrete make? As nearly as possible, a cubic yard.
21187. Are those the figures you took, as a rule, to make up your estimates? Yes.
21188. Had you a share in any property at North Shore? Yes.
21189. Where is it? The property in which Dr. Kyngdon is living.
21190. What is it called? The "Lodge" property.
21191. Who are the shareholders in it? Mr. Carter, Mr. Forrest, and myself.
21192. Do the three of you own equal shares? Yes.
21193. Have I had anything to do with it? Nothing whatever.
21194. Have you any interest at all in the firm of Carter, Gummow, & Co. at the present time? An interest in something we are trying to get in Adelaide.
21195. But you are not a partner in the firm? No; I signed a dissolution of partnership some time ago.
21196. Do you hold any other property with Mr. Carter and Mr. Forrest? A section in Miller-street belongs to the three of us.
21197. Do you know a man named Harry Labrees, who worked on the Glebe contract? Yes.
21198. Have you ever spoken to him? Yes; many times. He was working with me for five or six years.
21199. Did you ever tell him that there was any suspicion that he was doing bad work, and that the department had a special eye upon him? No.
21200. Did you ever know of any such suspicion? No; I never heard of it.
21201. As far as you know, was there any defective work done upon any of the contracts with which you are connected? No.
21202. It has been your desire, as a member of the firm, to have the work properly done? Yes.
21203. Have you endeavoured to have it properly done at all times? I think so. I think the department can testify that our work has always been done as well as any work of the kind could be done.
21204. *Mr. Davis.*] I suppose you have kept yourself in touch with what has been going on upon this Commission? I have not heard a word about it from the time I started away from the Colony until Mr. Carter and I were talking about it yesterday afternoon for a short time. With that exception, I know nothing

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nothing of it. I have not seen a Sydney newspaper for the last five or six months until yesterday morning, nor had I had any letters from anyone in Sydney telling me about the Commission.

21205. You said just now that you could make up a schedule better than could any officer of the department? Yes; and I think so still.

21206. In fact, I think you pride yourself that you can make up a schedule to suit the contractor as well as can anyone? Yes.

21207. You know that there was a change made in the system of tendering? Yes.

21208. Will you tell His Honor how you regard it? I do not like it at all. It gave men who had no experience in the carrying out of works as good a chance as had men who had spent a lifetime in learning how to do it.

21209. Can you tell His Honor how the change of system affected Carter, Gummow, & Co. in tendering? Carter, Gummow, & Co. were the most experienced contractors in their line in Sydney, and the change gave other contractors, who had less experience, just as much chance of getting a job as had Carter, Gummow, & Co.

21210. So that, while the department was not able to make up schedules in the same expeditious and advantageous way that Carter, Gummow, & Co. could do, they were able to cope with the firm? Yes; that is the reason I left the firm. I thought it was not good enough to carry on contracting under the system you had introduced here.

21211. I ask you again whether you received any assistance from any officer of the department in preparing your tenders? No. I should not consider any officer of the department capable of giving me assistance.

21212. Is there anything that any officer of the department could give you in the way of information which would have been of assistance to you? No.

21213. Take the 12 square yards of bluestone pitchers in Contract 69—did any officer of the department call your attention to that? No.

21214. Did any officer of the department call your attention to the probable quantity of rendering? No.

21215. Was your object in putting in a big price for cement rendering the same object that you had in the case of the bluestone pitchers? Exactly the same.

21216. Have you had any financial dealing with either Mr. Hickson or myself, or are you aware of your firm having had any financial dealings with either of us? To my knowledge there have been none.

21217. You are aware of no private financial dealings with either Mr. Hickson or myself on the part of any member of the firm? None; and if the firm had had any such dealings I am certain that I must have known of them.

21218. I suppose you would regard your schedule of Contract 69 as about as flagrant an instance of the rigging of schedules as any you have had experience of? I do not think it is a flagrant case of rigging at all. I think it is a cleverly made up schedule.

21219. Are you surprised to find that, in putting in such a tender, you made a rod with which to whip your own back? I had to compete against the rest of the contractors, who did exactly the same thing. The one who fixed up his schedule most cleverly, of course, would be the most successful. There is no exception to the practice among the contractors in Sydney. I think our schedule in Contract 69 was about the second-best schedule which has been made up in Sydney. There was a schedule for a pipe contract at the Glebe made up by Mr. Williams, which was a still better schedule.

21220. What would you regard as "better" as applied to a schedule under those circumstances? The one out of which the most profit could be made with the least money.

21221. That is to say, the best final certificate out of the lowest lump sum tender? Yes. This "rigging," as you call it, is a common custom in the four Colonies in which I have been.

21222. It is the custom, you say, to rig the schedules in much the same way as you rigged yours in the case of Contract 69? I cannot say that I have seen as much as that done in the other Colonies, but on one contract upon which I was employed—the Otago Central Railway—there was a good tender made out. I made it out myself.

21223. Did Mr. Baltzer give you any information in respect to any of these contracts? No.

21224. No information that was of any assistance to you? No.

21225. Was Mr. Baltzer in the employ of the firm before he was retrenched? Well, he designed the plan for the Monier arches at Johnstone's Creek. I went round two or three times to the place where he was staying, and sat with him while he was drawing the plan.

21226. The plan was drawn in Mr. Baltzer's own house? Yes.

21227. Did he get anything from the firm for that work? I cannot tell. He had not up to the time I left it. He may have received something since.

21228. *His Honor.*] Do you not regard the £50 for bluestone pitchers as carrying the principle of rigging a little too far? I do not know. Before that a tender had been accepted where the price was 1s. or 2s. a yard for rock excavation, and 10s. a yard for soft ground excavation. That was under the Water and Sewerage Board.

21229. But there the speculation was on something which the contractor thought he knew better about than did the department, and which nobody could be certain about? I thought I knew better about the pitchers than did the department.

21230. Did you not see that there must have been a mistake? I tendered on the contract in Bourke-street some years ago, before I met Mr. Carter at all. It was for the altering of twenty manholes in Bourke-street. There was a small amount of concrete and brickwork. The twenty manhole covers were to be fixed, and I tendered to do the work, putting in 10s. a cwt. for fixing the iron. The department had put down 20 cwt. of iron instead of 20 tons. It was a clerical error, but I took advantage of it, and made £100 profit out of a £50 job.

21231. It was a similar case of clerical error? Yes.

21232. You think it fair to take advantage of clerical errors? I do in open tendering.

21233. Because anyone else may do so? Yes; you must remember that I am competing against other persons in that respect.

21234. *Mr. Davis.*] Was the job to which you have just referred under Mr. Smal? Yes.

21235. *Mr. Parkes.*] Were you upon Contract 72 during the whole of the time it was in course of construction? No; I only went down and visited it once a fortnight or so.

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21236. You only went there to visit it? Yes; and to make up the measurements.
21237. Could you say where the cement sheds were upon that job? There was one down near the far end of the job. There was one near the boiling-down establishment; one near the junction of the Macdonald Park and Munni-street; one in Munni-street; and one in Knight's paddock.
21238. How many altogether? Five, I think.
21239. When you were concluding that contract—that is the first portion, which Mr. Hickson stopped—you were still buying cement? No; I do not think so.
21240. Was cement being delivered? It was coming out under a contract we had made at the commencement of the work.
21241. Did your contract compel you to take cement whether the work was going on or not? Yes.
21242. What is the nature of those contracts? You agree to take a certain number of casks of cement making up approximately the number you want for particular contracts.
21243. Do you pledge yourselves to the merchant to take the whole of the casks whether you want them or not? Yes; practically we do. If we find, when we are getting near the end, that we want 100 or 200 less sometimes we approach the merchant and get him not to deliver them. But if the casks were on their way out—if they had been shipped from Europe—we should be obliged to take them. In fact, we paid the Cullen Bullen Company £125 to get out of an agreement which we had with them to supply us for the Waverley contract. The quantity was approximately 3,000 casks, and we had, I think, about 1,000 or 1,500 to come. We then determined to use another brand of cement, "Germania," which has turned out, I think, to be the best brand which ever came to Sydney. We wanted to get out of our bargain with the Cullen Bullen Company, and they made us pay £125 to get out of it.
21244. Was the Cullen Bullen cement condemned? A great deal of it was. Some of it was passed and used.
21245. Who were the merchants delivering at Contract 72? I fancy Parbury Henty, but I could not say. I had very little to do with the supply of material.
21246. Henry Austin was also delivering, was he not, as well as Parbury Henty? Yes; he supplied a lot.
21247. Were those the principal persons off whom you purchased? Yes.
21248. Did you yourself see the quantity of cement which was stored upon Contract 72 at the stoppage of the first portion of the work? Yes.
21249. Where was most of it stored? I think in the Knight's paddock shed, but I am not sure.
21250. You saw Burcombe shifting the cement, did you not? Yes.
21251. Did you notice from what shed he took it? No; I was at North Shore then. I was carrying on the North Shore Contract 79.
21252. And you would see the cement coming to North Shore? Yes.
21253. Where did Burcombe put it? In the cement shed in Alfred-street.
21254. You are sure of that? Yes.
21255. Could you tell us about how many casks Burcombe took across? No; I could not say now.
21256. What kind of dray had he? A two or three horse dray—I am not sure which.
21257. Was this cement taken over at the stoppage of the first portion of the work? No.
21258. When was it taken? Some months afterwards; I do not know how long.
21259. Cement was being delivered on 30th April, 7th May, and 3rd June, in parcels of 967, 994, 184, and 9, 9 being the last lot. If you had that cement stored on the ground, why were you taking delivery of these other cements? I do not know, I am sure. It happened some time ago.
21260. For instance, you bought this cement on 30th April under order from Henry Austin, and on 7th May and 23rd May;—why did you not send that cement direct to North Shore and keep the cement on Contract 72 which you had already there? I cannot explain the reason now. There was a reason for it at the time, no doubt.
21261. You recollect Flood's buying some cement from Contract 72? Yes.
21262. What shed did he take it out of? I could not tell you that; I did not see it taken away.
21263. He took something like 800 casks? I do not know the number.
21264. He paid a cheque for £400 odd? Yes; I remember his paying that amount.
21265. How did the firm pay Burcombe when they paid him? The amount due to him was put in the pay-sheets.
21266. He was paid as a labourer? Yes.
21267. You said in your evidence that cement was carted from the North Shore to the Glebe;—at what time would that be? I cannot tell you.
21268. Can you recollect when the first cement was used on the North Shore job? No.
21269. Were you on the North Shore job from the very first;—from the excavation? No; I was in New Zealand.
21270. You were there when the North Shore excavation commenced? Yes.
21271. About what time did you go to the North Shore contract;—it was when the cementing was starting, was it not? No; that did not commence for a long time afterwards.
21272. How long were you in New Zealand? I was three months away.
21273. It is the custom of contractors to sign the certificate with the engineer for each payment? Yes.
21274. If you signed a certificate upon this contract on the 12th June, 1892, that would be when you first went on to the job, supposing Mr. Carter to have signed the previous certificates? I expect it would be that; but sometimes, when I was on the job, Mr. Carter may have signed certificates. I may have been away somewhere for the time being.
21275. Was the claim which was put in for Contract 72 shown to you before it was made up? I myself supplied the headings upon which the claim was made up.
21276. There is an item in it of 1,300 casks of cement on the job? Yes.
21277. And there is an item of loss on sale of 2,000 casks? Yes.
21278. If you were making up such a claim, would you not have counted the casks of cement and put in the entire quantity? It is rather difficult to count casks of cement in a shed; but, in any case, we could not claim for as much cement as we liked to store upon the job. We could only claim in respect of as much cement as would be required to complete the contract.
21279. You have put in a claim for 2,000 barrels stored in the Knight's paddock shed; but that was not on the job? If it was not on the job, it was in a convenient place for the working of the job.

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21280. That would be for the second portion when you got it? The second portion was in the original contract. It was all one contract. What you call the second portion was an uncompleted portion of the original contract, with which we were ordered not to go on as the money was exhausted. There were not two contracts, or two parts of the contract. It was all one contract, from the outlet to Munni-street.
21281. But on 13th October, 1891, Mr. Hickson wrote, stating that from the want of funds he would withdraw the upper portion of the contract? We claimed that he had no power to withdraw it.
21282. And ultimately it resolved itself into a suspension? Yes.
21283. Nevertheless your claim refers to withdrawal? Yes.
21284. For withdrawal, absolutely? Yes.
21285. Do you know a firm called Taylor, Britton, and Danaher? Yes.
21286. Do you remember their buying cement of you? I cannot remember much about it, but I think they got some cement from us.
21287. The evidence is to the effect that they bought 600 casks of cement;—where did it go from? I could not tell you. I have not the least idea now; it happened so long ago.
21288. When you first took up Contract 72, did you anticipate getting the channel which was excavated down the bed of the proposed ship-canal? I thought we might get it.
21289. But it was not included in the contract you signed? It was shown on the plan, but I do not think there was a sufficient quantity in the schedule to cover it.
21290. You did not sign from that point? Yes; we did. It was all in the plan we signed, I think.
21291. But it was not absolutely included in the contract? There was nothing to show that it was not.
21292. When you received Contract 79, do you know whether Mr. Carter, before speaking to Bond and Hudson about buying them off, saw any of the officers of the department? I could not say whom he saw or anything about it. I have no knowledge of his having seen anyone in connection with the matter—in fact, I am pretty certain that he did not see anyone.
21293. Did you ever have any words with any officer of the department on the subject? Not in connection with that.
21294. It was rather a big lump of money to give away on the chance of getting the contract, was it not? As I said a little while ago, I regarded it as a toss of the coin for £1,500.
21295. If you were as shrewd in money making as in the making up of schedules, you would not have tossed up a coin for £1,500? I am not as shrewd in money matters as I am in making up schedules.
21296. You must have been pretty certain of getting the contract? I thought, after the arrangement was made, that it was a risky thing to do, and for some considerable time afterwards I had made up my mind to lose the £750.
21297. There was no conversation which you know of about obtaining a contract until Mr. Carter came to interview Mr. Hickson with the claim which has been referred to? There was no mention of our getting the North Shore job until we put in our claim in respect of Contract 72.
21298. That claim you regarded as a lever with which to obtain Contract 79? Yes.
21299. Were you present when Mr. Carter had the interview with Mr. Hickson on the subject? I do not think so.
21300. Did Mr. Carter tell you what had happened? No doubt he did, if he had an interview with Mr. Hickson in regard to the matter, but I do not remember definitely that he had one. If he had an interview it would be most likely that Mr. B. C. Simpson would be with him.
21301. Did you ever hear what transpired at the interview? I must have heard whatever transpired, because, if there were anything of that sort going on, Mr. Carter would be sure to tell me. I do not remember, however, what he said.
21302. As to Contract 77;—did you ever hear Mr. Carter mention an interview with any public officer prior to the date of your putting in your substituted tender? No.
21303. Did you yourself have any interview with any public officer in reference to that matter? No.
21304. Did you ever speak to Mr. Hickson on the subject? No.
21305. Did you ever speak to any officer of the department on the subject? Not in regard to that contract.
21306. Excepting Mr. Baltzer? Excepting Mr. Baltzer, but he was interested in the patent itself.
21307. Did Mr. Baltzer ever have a conversation with you about the probability of your getting the work? No; I do not think he did. He would not be likely to know anything more of the probability of our getting the work than we should ourselves. He had no influence in getting us the work.
21308. Do you not think Mr. Baltzer was going to a great deal of trouble in the matter if he did not ultimately see that he would get the job? I do not think he considered the trouble at all in connection with that matter. He was merely taking his own part as a shareholder in the patent. He was trying to make it a success, I presume.
21309. Would it be his duty to try to get the design accepted? He had nothing to do with getting it accepted or otherwise. He had no say in the matter.
21310. But it would be to his interest to get it accepted? Yes.
21311. Did he never discuss with you the probabilities of your getting that contract? No.
21312. Did he discuss the prices? No; not to my recollection.
21313. When you sat with him at his own house speaking about this work, would you not be likely to discuss the profit which would probably be made upon it? No; because I had not the prices made up then.
21314. In regard to Contract 79, did not all the members of the firm of Carter, Gummow, & Co. receive benefit from it? The only persons who received any benefit from Contract 79 were Mr. Carter, Mr. Forrest, and myself.
21315. Did Mr. Gummow, Mr. Gillan, Mr. Maddison, and Mr. Ewing receive nothing whatever? Nothing from Contract 79.
21316. But in keeping the books, were not the moneys from Carter & Co.'s account transferred to the Banking account of Carter, Gummow, & Co.? No; when we joined with Carter, Gummow, Gillan, & Co. we had to put an even amount of capital down.
21317. On what date did you join? Four years ago, I think.
21318. Was there not an arrangement between you from the start, in October, 1892, that you should draw at the rate of £43 per month. That would be Mr. Gummow, Mr. Gillan, Mr. Maddison, Mr. Ewing, Mr.



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Mr. Carter, Mr. Forrest, and yourself? While we were in employment. But if any of the partners were out of employment, and had no contract to carry on, they only drew half the amount.

21319. But if the money were drawn regularly by all of you except Mr. Gillan, who, I presume, drew in Adelaide, that would show that you participated in all these contracts? In all the contracts we were carrying on.

21320. You were probably in all the contracts, whether your names appeared or not;—for instance, Mr. Forrest, whose name did not appear in connection with Contract 79, participated in it? Yes.

21321. And Mr. Gummow, out of the general business account, participated? But only out of the moneys of the firm of Carter, Gummow, & Co. He did not participate in the profits of Contract 79. He did not get one three-penny piece out of that contract.

21322. Was not the money for No. 79 transferred to Carter, Gummow, & Co.'s account? No; it never was.

21323. In connection with Contract 79A, which was an extension of 79, Carter and Co.'s contract, the moneys passed through the Treasury as Carter & Co.'s? When we were carrying out 79A we had become the new firm of Carter, Gummow, & Co. The money in respect of that contract, therefore, was paid by the Treasury to Carter & Co., and transferred from them to Carter, Gummow, & Co.

21324. Did you make up the estimate for the departmental design on Contract 77? Yes.

21325. Do you know where it is—have you it? No.

21326. Have you a copy of it? No.

21327. You said that Mr. Bagge did you a bad turn;—what was it? Well, I believe the Monier system would have been in general use in the Colony had it not been for Mr. Bagge.

21328. How is that? Because he ran it down all the time.

21329. He did not run it down, did he, except in so far as he thought it necessary that there should be a good test of the system before it was adopted—that it should have a good trial? He said at once that it was of no use at all, without taking into consideration any trial.

21330. If you read his written reports you will see that all he advocates is that a proper trial should be given to the system? I have not seen his written reports; but I heard him say that the system was no good.

21331. Is there any other reason for your saying that Mr. Bagge did you a bad turn? No.

21332. He did you no other bad turn? No.

21333. Do you recollect Mr. Bagge's going out to Contract 53—the Waverley contract? Yes.

21334. Were you present at the time? I was on the job at the time, but I was not present with Mr. Bagge and Mr. Davis. I was there a few minutes after they had left.

21335. Then you did not see Mr. Bagge there at all? Yes; I saw him from the top of the hill.

21336. There was on Contract 72 a section of the work which was filled by deposit from flood-waters, was there not? I do not remember any; I do not think so.

21337. Are you sure of that? I cannot remember that there was any deposit from flood-water. I do not think there was.

21338. In reply to one of Mr. Gummow's questions, you said that the residue of the spoil taken from Contract 69 was given to the Marrickville Council;—was the stone or material taken out of the job used for concrete? Some of it.

21339. In Contract 77 and the Annandale jobs generally was stone out of the cuttings used in concrete? The stone out of the tunnels at Annandale was used for concrete, and very good stone it was, too.

21340. In regard to Mr. Weedon's matter, do you know anything about his lending £2,000 to the firm? I know Mr. Carter made an arrangement to borrow £2,000 from Mr. Weedon.

21341. Some of the property in which you are interested formed part of the security? I believe it did.

21342. Part of the North Shore property formed part of the security? Yes.

21343. What did Mr. Carter say to you about the matter when he was borrowing the money? He told me that Mr. Weedon had £2,000, which he was talking about investing in building, but that he did not think it was a good time to do so, especially as he might be shifted about the country anywhere. I understood that he asked Mr. Carter's advice about investing the money in some way, and Mr. Carter thereupon said that he would take it himself, and give him interest upon it. After he had agreed to that, Mr. Carter told me about it.

21344. And then the money was used by the firm? Yes.

21345. How did you obtain Contract 79A;—did you approach the Minister? Mr. Carter did that business.

21346. You yourself knew nothing about it? I knew that he had been to the Minister once, and I remember that on another occasion I went with him. When we were sitting talking to the Minister, he called Mr. Hickson down and asked him what was the departmental estimate for the job. Mr. Hickson said that it was £12,800, or something like that. Mr. Lyne then asked Mr. Carter whether he would be willing to do the work for that amount of money. Mr. Carter said that he would, and Mr. Lyne then said, "Very well, Mr. Hickson, that is sufficient." Mr. Hickson suggested that if tenders were called for the Minister would probably get the work done for less money than the departmental estimate, but Mr. Lyne said that calling for tenders would take a considerable time, and that if the departmental estimate was a fair one, and the contractors were willing to do the work at that price, they having the plant and men available, it was better that work should be proceeded with.

21347. Mr. Carter was with you, was he not? Yes.

21348. And Mr. E. M. Clark, the member for St. Leonards? Yes.

21349. Did you ask Mr. Clark to introduce you to the Minister? I believe Mr. Carter did; but I did not.

21350. As to young Mr. Hickson—was there at any time any discussion about taking him into the firm? Never.

21351. There was no probability of his getting into the firm? Not the slightest.

21352. Did he himself ever want to get into the firm, do you know? I never heard so. He may have had such an idea. I do not think, as far as I know, that he ever expected to be in the firm. I do not see that he had any ground for such an expectation.

21353. What was the date of your retirement from the firm of Carter, Gummow, & Co.? I cannot tell you the exact date; but I signed a dissolution of partnership, and that would give the date, I daresay. You have it in evidence probably. Mr. Andrews could tell you the date, because he drew out the dissolution of partnership.

21354. You took out only £2,000? No; I do not think so.

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21355. You repaid £2,000 to the firm lately, did you not? Yes.
21356. You drew it out and repaid it? Yes.
21357. Why did you repay the £2,000—have you still an interest in the firm? No; but I had drawn £2,000 more than had Mr. Carter or Mr. Forrest.
21358. During the course of all the contracts? Yes.
21359. And you repaid that proportion? Yes.
21360. Of your own knowledge, you cannot speak as to the quantity of cement which was upon Contract 72 at the time of the suspension? No.
21361. *Mr. Gummow.*] With regard to signing the measurement book, can any member of the firm sign it? Yes.
21362. It would not have been necessary for you to have been present on the occasions referred to by Mr. Parkes? No. In fact, I was very likely to be away, and if Mr. Carter was away he might give Reid an order to the Government engineer to allow him to sign for the firm. On several occasions he signed, I believe.
21363. Are you of a speculative turn of mind? I think so.
21364. In giving Bond and Hudson the £750 you absolutely risked it? Yes, absolutely.
21365. You were willing to let it go under any conditions, whether you got the contract or otherwise? It would have gone right enough if we had not got the job.
21366. Did you know when you gave Bond and Hudson the £750 that you were going to get the job? No; and for months after that, I was very much afraid that we should not get it.
21367. It was merely a speculation? Yes.
21368. Regarding Mr. Baltzer, does he know anything about prices? Nothing, according to my idea. He may think he knows as much as I do about them, but I do not think he does.
21369. Would you be likely to discuss the prices of things with him? No; I should regard it as waste of time.
21370. What was Baltzer's duty in regard to the Monier contract? He had simply to make the design.
21371. As to the salaries paid to individual members of the firm, you are quite positive as to Mr. Gummow, Mr. Gillan, Mr. Maddison, and Mr. Ewing, getting nothing from Carter & Co.'s contracts? Certain.
21372. You are quite satisfied that they had nothing to do with Contract 79? Yes.
21373. Or Contract 72? Yes.
21374. Or any previous contract? Or any previous contract.
21375. What was their first connection with the firm of Carter & Co.? On the job we got at Adelaide.
21376. What was the first contract we got together in New South Wales? No. 69—the Marrickville contract.
21377. On no contract previous to that had we anything to do with Carter & Co.? No.
21378. As to the stone which came out of the tunnel on Contract 77, where was it used? On No. 118.
21379. Did you give any security to Mr. Weedon for £2,000? No. I did not see Mr. Weedon in connection with it. I never spoke to him about it.
21380. You had nothing whatever to do with it? Nothing whatever.
21381. Mr. Parkes said that you received a cheque for £2,000;—can you detail the circumstances showing how that £2,000 came to be paid to the account of Carter, Gummow, & Co.? Mr. Gillan, Mr. Maddison, Mr. Ewing, and Mr. Gummow, had paid more than their share of the capital of Carter, Gummow, & Co. I received a cheque from Carter, Gummow, & Co. as portion of my share, that is, for £2,000, and I gave it back to Carter & Co. in payment of the £2,000 I had had. I suppose that Carter & Co. then paid the cheque into the account of Carter, Gummow, & Co. to pay some of their liabilities.
21382. In connection with 79A, to whom did the Treasury pay the money? Carter & Co.
21383. Whose money should it really have been? Carter, Gummow, & Co.'s.
21384. So that Carter & Co. would have to make transfers to Carter, Gummow, & Co. now and again? Yes; but they did not do it regularly. They sometimes let it accumulate.
21385. It amounts to this: that Carter, Gummow, & Co. gave you a cheque for £2,000 on account? Yes.
21386. And you owed that amount to Carter & Co. because you had had advances to that sum? Yes.
21387. Carter & Co. then paid the amount back to Carter, Gummow, & Co. on account of the 79A advances? Yes.
21388. So that it does not show that you have in any way an interest in the firm of Carter, Gummow, & Co.? I had none at all, excepting our interest in Adelaide. There is a matter in dispute at the present time, and if we gain our contention, I shall get a share of what is received. If we do not gain our contention, I shall have no interest at all in the firm of Carter, Gummow, & Co.
21389. *Mr. Parkes.*] Were Mr. Maddison, Mr. Ewing, and Mr. Gillan, the people who had the most money when you made up the firm? I do not know whether Mr. Carter had more money than they had or not.
21390. Why did they put in more money to make up the capital of the firm if they were not good moneyed people? I suppose that was the case.
21391. *Mr. Gummow.*] Did the firm of Carter, Gummow, & Co. put more money in than did the others? We put in half each at that time.
21392. Was it not an amalgamation of the two firms? Yes.
21393. Each side had to put in a certain sum? Yes. There was an equal amount put in on each side.
21394. So that this transfer of money was actually a transfer of money which the Treasury paid into Carter & Co.'s account, but which should have been paid into the account of Carter, Gummow, & Co.? Yes.
21395. It had nothing to do with the capital of the firm? No.
21396. Besides this £2,000, did you get any other money from the firm? Yes; £1,100.
21397. Making a total of £3,100? Exactly. I fancy I must have had some more money besides that, but I do not remember it at this moment.
21398. You received some salary after you had left the firm? Yes; three months' salary.
21399. Besides that salary and the £3,100, did you not receive any further share? I do not remember any.
21400. I presume you could tell from the deed of dissolution;—do you know what amount was in the deed of dissolution? No; I know that I received my share, whatever it was.
21401. *Mr. Parkes.*] You said that you trembled in your shoes after you had paid Bond and Hudson the £750? Yes.
21402. For a month after? No.

21403.

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21403. After the expiry of that month, what removed your fears? I said several months.
21404. When were your fears removed? When we got a notice that our tender was accepted.
21405. *His Honor.*] As to Chiene, do you remember his meeting with an accident? Yes.
21406. After that accident, was there any difference in the old man? He seemed to me what is generally called a little bit balmy. Sometimes he was right enough, and sometimes he was half silly.
21407. Have you seen him since you left the firm? Yes; he is quite broken down now.
21408. He never seemed to recover his old form? No.
21409. So that his memory would be likely to be defective? It must be defective now, I should say.
21410. You had a conversation with Mr. Hudson about his chance of making a profit out of Contract 79 if he got it? Yes.
21411. What was that conversation? I told them that they had a badly arranged schedule, and that, although they might have put in sufficient in their lump sum, supposing the schedule to have been properly arranged, still, as it was arranged, the work would be likely to so turn out that they would not make anything on the job if they took it up.
21412. Do you remember having any special conversation with Mr. Hickson on the subject of guttering and gadding as compared with blasting in relation to Contract 79? Yes.
21413. Had you that conversation with Mr. Hickson by yourself? No; Mr. Carter was with me.
21414. What was the conversation? We strongly objected to carrying out the work by guttering and gadding, because, had we done so, it would have cost the lives of hundreds of men. I already explained that I showed to Mr. Hickson and Mr. Davis a list of men who had died from the effects of guttering and gadding.
21415. Then do you remember some compromise being arrived at? Yes.
21416. How did you look upon that? I regarded it in this way; that we had to make the most out of a bad job—that we could not help ourselves.
21417. You conceded 2 inches of concrete lining which you expected you would have to put in? Yes.
21418. How much do you estimate that that would probably take off your final voucher? I do not remember what the estimate was.
21419. Had you at the time an idea of what that work was worth? Yes; I must have had.
21420. But you do not now remember what the amount was? No.
21421. There was an estimate made by Mr. Boys, I believe, on which a calculation was made, and upon which Mr. Davis and Mr. Hickson acted? Yes.
21422. But you cannot recollect now how the matter stood? No.
21423. You consider that you had a substantial reduction in that alteration? Yes; I consider that it was not a fair reduction.
21424. You thought you were got at by the department? Yes.
21425. As to the stone at St. Leonards, you remember the question which arose between the Municipal Council and the contractors? Yes.
21426. The contractors had allowed the stone to be taken away? Yes; we sold the stone at four shafts to the Waverley Council for 6d. a load. After we had been carting away for some time we received a letter from Mr. Davis, ordering us to allow the Woollahra Council to take the stone from the Edgecliff Road shaft, in their borough, and intimating that we would not get paid for the carting of the surplus spoil from that shaft. We let them take it away, but we reckoned that we had to be paid for the carting of the surplus spoil all the same, because the surplus spoil item means the first half mile. It may be a foot or a yard, or any distance, so long as the stuff is taken out of the tunnel.
21427. That is the way in which you read it? Yes; whenever they order us to leave the stuff within half a mile that item is carried out. I took the order to mean the mouth of the shaft, and that we were to let the Woollahra Council take it away. We claimed the full amount, but a settlement of the matter was finally made by Mr. Hickson. Mr. Davis said that we were not to get anything for it. We claimed the full amount—1s. 3d. per yard. Mr. Hickson said that we were certainly entitled to a reasonable profit on the schedule item, and he estimated that reasonable profit at 6d.
21428. How did that question come into the North Shore affair? In the case of the North Shore affair we got paid the surplus spoil; but, by an arrangement with the department, at the commencement of the carting of the surplus spoil, we asked for a tip. We always asked for a place to tip the stone, and we were told that we could dispose of the stuff as we liked, and that we should get the half-mile cartage. We arranged with the Council to take a great portion of the stone. We sold some, and we carted some away ourselves.
21429. The Council, I understand, paid your carters for carting it? They paid their own.
21430. Did the Council not pay you yourself? No; they had their own carters carting that away.
21431. Not your carters at all? No.
21432. What are you doing now? Surveying in New Zealand. I have applied for a license for an explosive manufactory, but I have not started it yet, and, in the meantime, I am surveying. There is plenty of work just now to be done in New Zealand by mining surveyors. They are in great demand.
21433. When do you intend to go back? Not before next week, I think.
21434. Is that on account of there being no steamer before then, or is it on account of your own business detaining you here? The steamer goes on Wednesday, but, having come here, I thought I might do a little business, and on that account I propose to stay on a day or two longer.
21435. Your work at the present time being surveying in New Zealand? Yes.
21436. How was the excavation on the earth channel upon Contract 72 disposed of? Instead of being thrown on the side—close to the channel—if that had been done it would have bulged in the sides, and the channel could not have been kept open—we agreed to take it out to a certain distance—I think 2 chains—and stack it there, provided we got paid half the price for filling.
21437. That was the arrangement? Yes.
21438. The ordinary arrangement for the disposition of the spoil would have been alongside the cutting? Yes.
21439. The temporary spoil bank would have been there? Yes.
21440. That you would not have been paid for under the circumstances of the contract;—it would have come under the heading of excavation? Upon that contract we had to get paid for all the stuff that was excavated twice, either as re-filling or as spoil.

21441. For all the stuff taken out of the earth channel as well? We got paid for that as excavation, and also under the item of re-filling. And the difference between the re-filling and the net amount of excavation was paid for as surplus spoil. The specification says the amount to be paid for as surplus spoil shall be the difference between the amount of re-filling and the total amount of excavation.

21442. How were you paid then? Half re-filling.

21443. Instead of surplus spoil? Yes. It was a special arrangement that, provided we did the extra wheeling, we should get paid under the item of filling, but at half price.

21444. If you had put the stuff close to the excavation, how would you have been paid? We should have been paid for it as filling or as surplus spoil.

21445. You were paid altogether 3s. a yard? Yes.

21446. *Mr. Parkes.*] Will you look at page 162 of the Parliamentary return, and tell me how you made up the amount? The difference between excavation and filling will explain it. Those two amounts should be the same, but, instead of making a new item at 6d. a yard, the quantity was divided by 2. The amount was put in as a shilling. I think the papers which were made out by Mr. Boys will show that.

21447. If you look at the original tender which appears upon page 139 of the Parliamentary return, you will see that filling is put in at 12,000 yards, and excavation at 26,200 yards;—where is the earth-channel spoil put down at 6d. in the final voucher? It was paid for under item No. 2, filling.

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Joseph Davis called and further examined:—

21448. *His Honor.*] I believe you undertook to supply at the request of Mr. Parkes the date of the discontinuation of the practice of making advances on material? Yes, I have not yet supplied the information; but I will endeavour to supply it to-morrow.

J. Davis.  
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TUESDAY, 3 NOVEMBER, 1896.

George Scott Chiene recalled and further examined:—

21449. *His Honor.*] I believe you wish to make an explanation to the Commission? Yes; about some G. S. Chiene statements made by Mr. Eaton.

21450. What is the explanation? In the first place, Mr. Eaton says that I asked him to give me a job out of charity. As a matter of fact, I went to Mr. Eaton after Mr. Rumble, the engineer, had spoken to him about me. Mr. Eaton also charged me with making a wrong measurement of concrete. In explanation of that I have to say that I never saw the specification, and that I did not know where the bluestone concrete commenced or how much of it was to go in—in fact, I understood that the whole of the walls of the sewer were in bluestone concrete, and that the bottom of the work was in sandstone concrete. When this certificate which has been referred to was made up, Mr. Eaton and I came away in the tram together. When we were there Mr. Eaton asked me how much bluestone concrete I had got in, and I handed him a rough certificate which I had with me, and told him. He said to me, "You have got too much." I told him that he could not alter it then, but that the quantity could be altered in the next certificate. When the next certificate came in Mr. Eaton asked me to get as much as I could. He afterwards said to me, "What about the bluestone concrete?" I told him that if Mr. Henderson did not allude to it I would not do so. I knew, of course, that the quantities had to be checked and re-checked, and that the mistake would be found out in the final certificate. That was on the 6th. On the 12th, Mr. Eaton gave me £2, and asked me to come out again on the 13th to lay out a curve. That was in February, 1896. I did not go out on the Thursday, because it had been raining overnight, but I went out on the Friday and found that the curve had been put in. On the Saturday I sent in my resignation and waited for an answer. On the 21st of February I sent in an application to the Secretary for Public Works, and I also wrote a letter to Mr. Henderson telling him that I wanted to see him. Mr. Henderson sent me a telegram, which I did not receive until too late. It was as follows:—"Just received your letter. Meet you at 12, General Post Office." I saw Mr. Husband, the inspector, the next day, and he told me about the telegram. I told him that I wanted to see Mr. Henderson about a wrong measurement. I afterwards wrote to him and told him where the mistake had been made. That is all I have to say as to that matter. With regard to the allegation that I frequently borrowed money, I have to explain that from the 18th January to 12th February I never received anything from Mr. Eaton. I borrowed 1s. from the foreman to pay my fare. I borrowed another 1s. from one of the carpenters, and I borrowed a third 1s. from another carpenter. I borrowed 3s. from Mr. Eaton himself, because he asked me to get out at the works at a quarter to 8 in the morning.

21451. *Mr. Parkes.*] What salary did he give you? Fifteen shillings a day. He pleased himself as to the days upon which he employed me. As a matter of fact, when I sent in my account to Mr. Eaton he refused to pay it, and I sued him in the District Court, and lost the action. Mr. Eaton talked about a certificate being wrong. The certificate was wrong, so far as the bluestone concrete was concerned. At 14 per cent. below schedule Mr. Henderson made the amount £61. I told Mr. Eaton of this, and as the sum was £493, he at once said, "At 14 per cent. it ought to be £70." I showed him the amount of £69 2s. 3d. in the certificate. When I afterwards saw him he told me that that was right, and that that was the amount the Government had paid him. When I gave him the correct certificate he gave me back the one I now produce, and kept the wrong one.

21452. *His Honor.*] Are the pencilled figures his? Yes.

21453. What are they supposed to represent? Nails or something he wanted to order. There are some other calculations there. I do not know what they are.

21454. Who is Mr. Rumble? One of the Government engineers.

21455. You received a letter from him to Mr. Eaton? Yes; it is as follows:—"Dear Chiene,—If you will see Eaton, the contractor, on Tuesday next, at 10 o'clock a.m., on the job at Double Bay, he has promised me to do anything he can, without, of course, injuring himself. He has never employed a man before, and the job without a doubt is cut fine. On no account miss this appointment which I have made for you. I think you are certain to get something out of it."

21456. That means that Mr. Rumble sent you to Mr. Eaton on the off-chance of your getting something

- G. S. Chiene. to do when you really wanted something to do badly? I do not know whether Mr. Rumble asked Mr. Eaton to take me out of charity or not. I myself never said anything to Mr. Eaton about charity, although, as a matter of fact, it was a charitable action.
- 3 Nov., 1896. 21457. *Mr. Davis.*] Did Mr. Rumble have anything whatever to do with the Double Bay work? Yes.
21458. In what way? He laid out the kerb line of the manholes at Double Bay.
21459. Was he the resident engineer there? No.
21460. What was his position when he gave you that letter? I understood that he was an engineer in the Water and Sewerage Construction Branch.
21461. Do you know that, as a matter of fact, Mr. Rumble, at the time you have spoken of, was a surveyor? I understood that he was doing all kinds of work.
21462. How many certificates did you make out at Double Bay in conjunction with Mr. Henderson? Two.
21463. Was the mistake rectified while you were on the works? On the 21st February I wrote to Mr. Henderson, and told him that I wanted to see him.
21464. Did you see him then? No.
21465. Did you see him at all? Yes, afterwards.
21466. What did you say to him? I told him about a mistake in the certificate. He asked me to write to him about it, and I did write.
21467. Did he say that he had found out the mistake before you communicated with him? He told me so this morning, but he never said so before.
21468. When you told him did it appear to be news to him? I understood so at the time.

Robert Rowan Purdon Hickson recalled and further examined:—

- R. R. P. Hickson. 21469. *His Honor.*] I wanted to ask you a few questions as to your recollection of the history of Contract 72. First of all, do you remember what Contract 72 was to be in its entirety—that is to say, where was it to end? At the canal.
- 3 Nov., 1896. 21470. At that time was it expected or supposed that when Contract 72 came to be constructed the canal would have reached that point? Yes.
21471. The canal itself? Yes.
21472. You remember when the plans were prepared for No. 72? Yes.
21473. About how long would it be before it was begun? I think a very short time before, but I could not say definitely without looking through Mr. Bagge's journal.
21474. Was it before the injunction was got out against the Harbours and Rivers Department, stopping the canal from coming up from the southward? I think not. I think it must have been after that.
21475. After the injunction? I fancy so; but, of course, I should not like to be certain about it without reference to the documents.
21476. The date of the injunction was, I think, 1889? Yes; I think April, 1889.
21477. That was an injunction obtained by McNamara, with the object of preventing the canal, which, of course, had nothing to do with Contract 72, from coming any further up from the bay? Yes, further than a certain point.
21478. For fear of the draining of his dam by percolation? Yes.
21479. That injunction stood actually until April, 1894? Yes.
21480. And during the time you say that that injunction was standing the plans for Contract 72 were got out? I think they must have been got out during that time. The work was commenced in 1891, and I think it is more than likely that the plans were got out at that time.
21481. If the plans were got out after the injunction was obtained, you could see that the canal would not be there? No, we did not know that, because we anticipated that an arrangement would be made to get the canal pushed through as quickly as possible.
21482. You thought that some arrangement would be made to get the injunction dissolved? Yes; you must remember that the injunction was got out against another branch of the department. I myself did not know exactly what was going on, but the Minister was anxious to get the canal pushed through, and it was thought by the time we had let the contract the canal would have been completed.
21483. But, in point of fact, at the time the contract was ready to let you found that the canal was not there at all? It had not moved an inch.
21484. It was necessary, then, to have an outlet; and you provided an outlet, or rather two outlets, along the line of Macdonaldtown Creek? We provided an outlet to Macdonaldtown Creek.
21485. But Macdonaldtown Creek, while it might have been an outlet, was not a sufficient one? There was an outlet; but we lowered Macdonaldtown Creek considerably, so that the level we had for the bottom of our sewer had no outlet unless a canal was made, or unless a cutting were made to the canal where it ended.
21486. Then the plans were prepared with the canal shown, were they? Yes.
21487. Now this is the point—the original quantities were taken out, I suppose, from the original plans? Yes.
21488. And those original quantities ended off at the termination of the concrete channel as originally proposed? Yes.
21489. In fact, where it ends now? Practically where it ends now.
21490. When the tenders were called for the contract were they for the whole of the contract, including the channel? Yes; at that time we knew that the canal was not cut, and that it would not be cut.
21491. I want you to explain, then, how it is that the original quantities were left in—the old probable quantities, exclusive of the channel—at the time tenders were called for, and, in fact, at the time the contract was let? I am afraid I could not tell you that. I should have to get the chief draftsman and the engineer-in-charge to explain that. I really could not explain it myself.
21492. When the tenders came in it was found that the lowest tender was over £20,000? Yes.
21493. And that tender being over £20,000, some arrangement had to be made, had it not, to avoid bringing the work under the notice of the Public Works Committee? I cannot say as to that.
21494. It was done, was it not, by making an arrangement for an outlet along the course of Macdonaldtown Creek, instead of the proposed earth channel? Yes.

21495,

21495. That is the way in which it was done? Yes.

21496. And by doing that the sum of £3,000 was, in theory, knocked off? Yes; something of that kind was done.

21497. Mr. Davis was called as a witness in the case of MacNamara against the Secretary for Public Works at a late stage of the proceedings—that is, on the motion for a new trial—and he then produced some minutes, explaining matters exactly, and showing the transaction—that is, the £3,000 being knocked off, and the approval of that by Mr. Bruce Smith, who was then Secretary for Public Works? I do not know of that. I was only a witness in the case. I do not know what Mr. Davis's evidence was.

21498. At any rate, you know that that is what happened—that Mr. Bruce Smith was requested to approve of the knocking off of the £3,000, with the object of preventing the work from coming before the Public Works Committee? With the object of not delaying it.

21499. A certain amount of delay would have ensued had the matter come before the Public Works Committee? Yes.

21500. In point of fact, was not the explanation of the earth channel's not being added to the probable quantities, that if it had been added to the probable quantities those quantities would have shown beyond all possibility of doubt that the lowest tender for the whole work, including the earth channel, must be something over £20,000? I do not think so. The leaving out of that portion of the work was done in the drawing office, immediately under Mr. Bagge, and I do not think he had what you suggest in contemplation at all. This arrangement that you have spoken of was made in the Ministerial branch of the office by the Under Secretary and Mr. Bruce Smith. Mr. Bagge probably knew nothing about it at all.

21501. But surely, in the ordinary course of things, Mr. Bagge, when told to add to the contract this large addition of earth channel, would naturally have also increased the probable quantities to represent it? I do not think that mattered very much, because, the contract being at Schedule rates, he had to pay at those rates, whether for 1 yard or 100 yards. We do not put the quantities in at all now.

21502. But at that time the probable quantities were given for the sake of making a comparison between the different tenders? Yes.

21503. The excavation on the line of the swamp was rather a different kind of excavation from the usual run of excavation on the line of the sewer part of the work? Yes; it was much more costly.

21504. Why was it more costly? Because it was much more difficult to get the men into the place.

21505. It was sludgy? Yes; it was most difficult to get the men to stand on it. I remember that when I went out there I had to have planks put down in order to get along at all.

21506. That being so, would it not have been in the ordinary course to have put into the schedule a head for this particular excavation, apart from the excavation into which the concrete channel had to be put, and into which the sewer had to be put;—would it not have been, in the ordinary course, a natural thing to put in a distinct head for this excavation per cubic yard? I do not think so; the difference was not so great as that. It was not so great as to warrant the making of a special item of it.

21507. It would have the effect rather of complicating the tendering to put two distinct kinds of work under the same general head? Yes; it would have been a difficult thing to do that. Take the upper end of the storm-water channel. No doubt the excavation there was fairly good, but when you got down towards Shea's Creek it became gradually worse and worse until you got to Shea's Creek itself. It was practically a swamp; and it would have been very difficult to draw the line between fairly good excavation and other excavation. If you divided the excavation at all you would probably have had to divide it into three or four lengths—good, not quite as good, bad, and so on.

21508. But instructions must have been given at some stage to Mr. Bagge to get the plans out for the earth channel when it came to be a necessary addition to the whole work? Yes, no doubt.

21509. Do you not remember that at some time instructions were given to him not to add the earth channel to the probable quantities? I do not think such instructions were given. I have no recollection of them.

21510. Would he not have added them as a matter of course if he had not been told not to do so? Not necessarily, because the contract was a schedule-rate contract.

21511. But would he not do so in order to show what the contract was;—anyone who did not very carefully examine the plans and compare the probable with the actual quantities would have been likely to be misled as to the whole of the quantities belonging to the earth channel—that is, on the plans as they were exhibited? Yes; as quantities.

21512. If a man looked at the plans, and took out his own quantities, he would arrive at a more or less accurate result;—if he looked at the plans, and did not take out the quantities, but relied upon the probable quantities, he would certainly be misled? As to the total quantities.

21513. Therefore a contractor might be misled in the form in which he tendered? I do not see that he could be misled in the form in which he tendered, because he would probably go down and see the nature of the work. There was a certain portion of the excavation shown in the schedule which was actually in Shea's Creek, and the contractor could see exactly what the nature of the material was. The other portion of Shea's Creek was not worse than that portion, while it was worse than the ground higher up the creek.

21514. You have no recollection at all as to how it came about that the probable quantities were not increased? I have not.

21515. You are positive that it was really not done for the purpose of saving the contract from coming under the cognisance of the Public Works Committee? I do not think it was. All the particulars as to the quantities were taken down in the drawing office, and I am almost certain that Mr. Bagge did not know anything about this arrangement at all. It was practically made in the Ministerial branch of the department.

21516. The knocking off of the £3,000 was the result of an order coming from the Ministerial branch? Yes.

21517. Then the idea was that the concrete channel might end, either where the present outflow is—that is, where the sliding doors, as they are called, are—or somewhat further up, some little distance above where the end of the closed work is to be found at present? Yes.

21518. Where it was considered there were convenient points in the channel of the Macdonaldtown Creek? Yes.

21519.

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21519. But I understand that, as soon as the work was let, the first thing that was gone on with was the earth channel, as a matter of course? Yes; to be an outlet.
21520. Was it not, in point of fact, known that, although these two outlets as probable points of departure were provided, neither of them would really be of any use, and that it would be practically impossible to end the work effectively at either of those two points? I am afraid I do not quite follow your question.
21521. It was provided that the contract itself—that is, the lower part of it—at either the 13 or 27 chains, might not be constructed at all, and that the outlet might be at one of those two points. Yet there never was any question, apparently, after the contract was let, as to where the work was to begin. It began, as a matter of course, apparently, with the earth-channel—the bottom of the whole affair. I want to know whether it was really ever expected that the work would satisfactorily end at either of the two points named? No; the outlet would have to be in the canal.
21522. Was there any *bona-fides*, then, in putting in the provision as to the leaving out of the portion of the work beyond the 13 or the 27 chains;—was it anticipated that the work could ever be satisfactorily carried out upon either of those two bases? I do not think either would have been a satisfactory outlet. At the same time there could have been an outlet on the old Macdonaldtown sewer, going towards M'Namara's Dam.
21523. You mean the old creek? Yes.
21524. That was supposed to be a natural watercourse? Yes; I quite admit that it would not have been a satisfactory one, but it could have been used as an outlet.
21525. It was necessary to deepen that creek for some distance down from the outlet, otherwise the sewage would have been backed up? Yes.
21526. The work appears to have been begun, without any question at all, near the injunction line—in fact, the work must have passed through the injunction line? That is so. I think there were sluice gates at the injunction line, to let the sewage from Shea's swamp out.
21527. That is where the work was actually begun by Carter & Co.? Yes.
21528. They began from the lower end? Yes.
21529. Do you remember now whether there was ever any deliberation or any question as to whether the work should begin there, or as to whether it should begin at either of the other two points? As soon as we were actually ready to start we found that the canal was not there, and we had to make an outlet, in order to make a complete job of it.
21530. Unless you had ended at one of the other two points? It was only a temporary work, and it was not very satisfactory, I admit, although it would have done something.
21531. It comes to this, then—that this provision was really put into the contract to get over the difficulty, and it was never intended that either of these two points should be used as the lower end? It was never intended that the work should be ultimately ended there, because it was intended to bring it right into the canal.
21532. The £3,000, I understand, came off the work between the mouth of the concrete channel and the upper one of these two points. That was the idea in connection with this estimate of £3,000? Yes.
21533. The earth channel, of course, was an additional work, not appearing in the estimate at all, and, in fact, not appearing in the probable quantities. Therefore, if the work had been made to end at the 27 chains, instead of £3,000 coming off, what would have come off the sum finally to be paid would have been something like £9,000? I cannot say from memory what the amount would have been.
21534. So that, beginning the work as it did begin, it was quite obvious, at the inception, that the sum of £15,500, and a good deal more, would be swallowed up? Yes.
21535. If the work had been continued up to the head at Munni-street? Yes.
21536. Was it not, then, for the purpose of placating the Minister, and with no intention of really ever ending the work off at either of these two points, that this provision was put into the contract—in other words, it was really a nominal provision? I would not like to say that without knowing exactly from the records of the drawing office how the quantities were got out, and how the estimate was arrived at.
21537. Who would be able to give us that information? I do not know whether Mr. Davis would be able to do so or not; but I presume Mr. Bagge would be the person best able to give you information on the subject.
21538. I suppose you yourself know, as a matter of fact, that the whole cause of action, in the case of McNamara against the Secretary for Public Works, was the making, not of the sewer, but of the concrete channel and the earth channel? I do not know that that is the case. So far as we are concerned, we did not take any water from McNamara.
21539. It is another question whether you did or did not take water—what McNamara rested upon was the work you had done? He did not get his injunction upon that ground.
21540. But apart from the injunction the cause of action was not founded upon any work that had preceded the injunction. That work was stopped, and it was stopped until the injunction was dissolved? McNamara said, I understood, that damage had been done by making the canal up to that point.
21541. What he said was that he was afraid that substantial damage would be done if the canal were continued further? I went down there with Mr. Darley, long before the storm-water sewer was commenced, to see whether the damage was done to his work by the making of the canal up to the injunction point, and at that time he was very strong in insisting that damage had been done there.
21542. That you had already done damage? Yes; that was his strong point—that we sucked water away from his dam.
21543. But his action rested upon the work which was done above the injunction line? I do not think that. I think it was the whole thing. The damage which had been done there, and the damage which he alleged was done by the sewerage works.
21544. *Mr. Davis.*] If you will read your minute, which appears upon page 514 of the evidence, in reply to question 15718, you will see that it gives precisely the reasons for the work being carried out in the form in which it was carried out? Yes; that minute was written by me in 1892.
21545. What was the amount of the lowest tender for the contract? Carter & Co.'s tender of £20,650.
21546. You do not remember what the estimate was? I could not say without looking at the papers.
21547. Will you look at drawing No. 3 of Contract 72, the contract drawing signed by the contractors and attached to the contract. You will see there details of the outlet of the channel where it enters the Shea's Creek swamp? Yes.



21548. The detail sketch shows where it enters the canal? Yes.  
 21549. Full provision is made in the detail drawing for the discharge of the channel into the canal? Yes.  
 21550. The object, evidently, being that the channel was to discharge into the canal? —  
 21551. Therefore it was presumed that a canal would be constructed at the time these drawings were prepared? Yes.  
 21552. Do you think that that could be the reason why the quantities that were given for the excavation of that channel along the centre line of the canal were not included in the schedule? That was the reason.  
 21553. The sketch in drawing No. 3 clearly proves what was in the mind of the officer in charge when he got out the quantities? Yes.

[*His Honor: I do not think you need trouble about the original scheme, Mr. Davis. The question is, why the probable quantities were not increased to meet the scheme as it was finally to be carried out.*

[*Mr. Davis: What I wanted to show your Honor was that it was not likely that provision would be made at the outlet of the channel for discharging into the canal, and that at the same time provision would be made for cutting the channel along the canal.*]

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Andrew Eaton sworn and examined:—

21554. *His Honor.*] Having heard Chiene's evidence this morning, is there anything you wish to say? I did not quite catch all he said; but I might perhaps be allowed to explain that Mr. Rumble was sent down by the department to lay out a new line, a slight alteration having been made in the original plan. While he was doing this he spoke of Chiene. He said he was very hard up, and it would be a charity to give him something to do. After talking the matter over with him, I told him to tell Chiene to come and see me. Chiene came down and missed me on the job, and came round to a sewer we were doing at Potts' Point. We met in the grounds of the Bishop's residence, and he there told me that he would come to me for 10s. a day. I said I would not like to cut him down; that I only wanted temporary assistance, and that if he liked to come I would give him 15s. a day, but that it would be only for two or three days a week. So far as the vouchers are concerned, the voucher I now hand you is the first one he gave me. The mistake is from 27 chains 44 feet to 28 chains 30 feet, being a distance of 52 feet. That would be 10·86 by 52 by 2. He gave me the voucher in the tram, and on looking through it I found out the mistake. I put these figures on it at the time—10·86 x 52 by 2. It ran out at nearly 40 yards; instead of being bluestone concrete it should have been freestone concrete.

21555. In whose handwriting was that voucher? Chiene's.  
 21556. Who wrote the word "cancelled" across it? Chiene. I found out that it had not been rectified in the second voucher. The third voucher I myself made up, but I have not been able to find it.

21557. In that voucher, was the mistake rectified? No; it was rectified in the fourth.  
 21558. When do you say that the mistake was first found out? I found it out on the day on which the voucher was made out, when we were in the tram together.

21559. When did you mention this to the inspector? I mentioned it to the inspector before the second voucher was made up, but I did not mention it to the engineer.

21560. How was it that you did not mention it to the engineer at once? I left it to Chiene to rectify.

21561. And he did not do so? No.

21562. And it was then that he had the conversation with you? Yes. The second voucher was made up in February. I asked him to meet me on the 11th February. I could not meet him on that date, and I sent word out to him that he was not to do anything until I had seen him. I saw him on the 12th February, and it was then that I told him that I would have no more to do with him, at the same time offering to pay him what was owing to him.

21563. He then sued you in the District Court;—how did that come about? We offered him what was due to him, but he refused to take it, and at the same time made an exorbitant demand in respect of a number of days upon which he had not been engaged by us.

21564. Did you pay into Court the amount which you admitted owing to him? No; we had already paid him. When he was going away on the 12th February, after I had told him that I would have nothing more to do with him, I gave him £2. I told him that I did not want to be hard upon him. I had always paid him what was due to him, and I have the butts of the cheques showing the payments.

21565. *Mr. Gummow.*] Did you ever inform Mr. Parkes that Chiene would be a good witness for him to get at this inquiry? No.

21566. Did you ever inform Mr. Parkes, by letter or otherwise, of anything in connection with Carter, Gummow, & Co.'s works? No.

21567. *Mr. Parkes.*] Did you ever tell Mr. James Alderson that Chiene would be a good witness for me? No.

21568. Did you ever say so to your brother, Mr. James Eaton? No.

21569. You are sure of that? Quite certain.

21570. Then how should I be likely to know? I do not know what you know.

21571. Did you never tell Mr. James Alderson and your brother, Mr. James Eaton, that you and Mr. Carter were the only two contractors who had observed the insertion of "cwts." for "tons" in the case of the Long Cove contract? No.

21572. You are sure of that? Quite certain.

21573. Are you absolutely sure that you never told Mr. James Alderson or your brother that Chiene would be a good witness for Mr. Parkes to call before the Commission? I never mentioned Chiene's name to my brother or to Mr. Alderson.

21574. Supposing I received this information from those gentlemen, based upon statements which they said you had made to them, what would you say to that? All that I can say is that I never mentioned Chiene's name to my brother or to Mr. Alderson.

21575. Did you ever mention the Long Cove contract to either of them? Yes.

21576. Did you not tell them that you and Mr. Carter were the only two contractors who had recognised the error in that contract? I did not say that we were the only two.

21577. But you told them all about it? Yes.

21578. Did you say that you expected to get a good thing out of it? Yes.

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- A. Eaton. 21579. *His Honor.*] A good thing in what way? Here is the schedule of the Long Cove Creek storm-water channel. When the work was advertised I found that a mistake had been made by inserting "cwts." instead of "tons." That, of course, would make a large difference. I saw my brother, Mr. J. W. Eaton, and asked him to see Mr. James Eaton about it. Of course, I thought that in all probability the error had not been noticed, and I thought that if I put in a tender for the job the price would be so low that it would be noticeable.
- 3 Nov., 1896. 21580. Mr. Carter did not get any benefit by it—he had to alter it? I had determined to stand by the schedule.
21581. You would have kept the department to the "cwts."? Yes; I should have tried to do so. I spoke to my brother about putting in a tender for the job, so that there should not be a great discrepancy between our tender and the other tenders which went in. That was before the tenders went in. I found out afterwards that there were two tenders besides Carter & Co.'s which were lower than ours. I saw then that the error had been noticed by others. I remember speaking to Mr. Alderson about the matter coming over in the Mossman's Bay boat, in the course of a general conversation, but I never mentioned Chiene's name to either my brother or to Mr. Alderson. I remember saying what a good thing I had lost, because I was under the impression that I was the only one who had noticed the error. I had found out afterwards that there were three below us.
21582. Carter & Co. do not appear to have tendered upon the assumption that they were going to keep the department to the mistake? I do not know what they intended. If I got the job I should certainly have tried to keep them to it.
21583. It is the sort of thing which contractors think fair to catch the department on the hop in a clerical error? If the department catch contractors on the hop they do not hesitate to keep them to their agreement, and if that sort of thing cuts one way it ought to cut both ways. If I said anything to my brother at all about Chiene it would have been to the effect that he was an altogether unsatisfactory man, and that I had had to get rid of him.
21584. *Mr. Gummow.*] You did not give information to your brother upon either subject with the object of its being taken to Mr. Parkes? No; I do not remember speaking to him at all about Chiene.
21585. *His Honor.*] I suppose that at some time you may have told your brother in conversation about Chiene? No, not at any time.
21586. Not in the course of ordinary conversation? I do not think I ever spoke to him about Chiene at all. I certainly did not speak of him as a witness. I only saw my brother James once in the course of several months.
21587. Is he also a contractor? Yes.
21588. Might you not have cautioned him about Chiene? No; he was not in the same line of work.

Joseph Davis recalled and further examined:—

- J. Davis. 21589. *His Honor.*] You heard the questions I asked Mr. Hickson this morning with reference to Contract 72;—is there any information you can give the Commission on that matter—the leaving out of the addition to the probable quantities which would have been expected upon the contract? Yes; I think I can tell you pretty well what did occur. To begin with, it was contemplated that the canal would be excavated by the time the channel would be ready to discharge into it. It is true that there was an injunction stopping the work, but it was contemplated that there would be a motion to dissolve the injunction and that the canal would be proceeded with. It was thought that by the time the channel was finished in all probability the canal would be ready to receive the drainage. When the works were commenced it was found that there was no chance at all of that. It was then decided that to give an adequate outlet it was necessary to cut a channel down the centre of the proposed canal. That was the first work put in hand. It was shown on the general plan, and it was also mentioned in the specification that this work might be carried out; but the chance of its being carried out seemed to Mr. Bagge, who prepared the specification and schedule, to be so remote that he left the quantities out of the schedule.
- 3 Nov., 1896. 21590. Why did he think that the chance of the work's being carried out was so remote? He thought he had three strings to his bow. He thought, first of all, that the canal would be constructed and that it would provide a proper outlet for the channel. In the original drawings he had made full preparation, in the event of the canal's being made by the time the channel was ready to be put in hand. The second string was this—he thought he had an outlet where Macdonaldtown Creek leaves the course of the channel at the site of the stop-board, and then he also had an outlet at Mitchell's Road into the creek bed. So that although we had not sufficient money to carry out the whole of the work, it was considered that we had ample provision made in the specification for varying the contract in any way which might be thought proper. First of all, with regard to the canal, the reason why it was not available was simply because it was not constructed; and with regard to the outlets at the 13 and 27 chains, the reason they were not available was that they were not there.
21591. In what way—were they not deep enough? Either the surveyor or one of the draftsmen made a mistake in the cross-section, and, I presume, misled Mr. Bagge, who considered he had an outlet at the 13 or 27 chains. When they came to carry out the work it was found that there was not such an outlet as had been supposed, and the only thing which remained was either to cut a race along the course of the Macdonaldtown Creek and through the Chinese gardens, to get an outlet in that way, which meant that the race would have terminated in M'Namara's dam, or have the work carried out as it has been—that is to say, with the channel extended along the course of Macdonaldtown Creek, through the sandhills, across Shea's Creek into the swamp, with an earth channel cut along the centre of the swamp along the site of the proposed canal, terminating below M'Namara's dam.
21592. Who was the surveyor? Mr. Corbett.
21593. After the suggestion was made about the knocking off of the £3,000, and after it had been approved, had he been sent down to find out what could be done? No; he made a survey in the first instance. The plan was prepared in 1890. It was known that we had not enough money to carry out the whole of the work, and provision was made in the contract to cut off the lower portion—that is, at the 13 or 27 chains, as the case might be. It was thought that we might get a specially good tender in, and, in that case, we could afford to carry out more of the work, or, if we got in a very good tender indeed, that the whole of the work might be carried out. If, on the other hand, as was expected from the rates then ruling, we got in a high tender, it might be necessary to eliminate the 27 chains of the work included in the

the schedule of quantities. When the work came to be carried out, as I have already explained, it was necessary, if there was to be a proper job made, not to eliminate anything from the lower end, but to commence the sewer at the line of injunction, and work upwards as far as we could get with the money available. That brought us to the bottom of Macdonald-street, and that is where the work was stopped in October, 1891, until further money was voted.

21594. Do I understand that it was you who discovered that a mistake had been made in the levels? I would not like to say I took the levels; but, when I came to carry out the work, I imagine I sent my officer down to lay out the work with a view of stopping at Mitchell-road, because I knew that we had only £15,500, and some small amount to come from another Vote for the Macdonaldtown Park sewer—about £17,000 in all—the tender being for £20,000 odd. At the time Mr. Barling asked the question whether the tender could be reduced it was not known that there could be no outlet at Mitchell Road. It was presumed that there would be an outlet there, and that the contract could be reduced to that extent.

21595. That was found out, you say, as soon as the work was taken in hand? Yes. It was found that the outlet would perhaps go along the course of Macdonald Creek into M'Namara's dam.

21596. And that would have involved a lot of trouble, and would have been finally a useless work? Yes. So that, taking everything into consideration, it was decided to anticipate the canal to the extent of excavating the earth channel, and to construct a channel as originally shown on the drawings, beginning at the canal and working upwards as far as the money would go.

21597. And then some part of the original plan was cancelled; but that cancellation must have taken place, I suppose, when the addition of the earth channel was made? The word "cancelled" was written across the contract drawing after the work was all finished. It is the custom of the office, when a work is finished, to show on the original drawings the work as executed, and if a portion is not carried out we write across that portion the word "cancelled" in red. If there are any small alterations in the work as carried out they also are shown in red. We, therefore, have a complete and perfect record of the work as executed. That word "cancelled" across the outlet of the channel was written in after the whole of the work was finished. That would be some time in 1892—in May or June, I think.

21598. *Mr. Norrie.*] Before the sewer was cut arrangements had been made between the tenants and the owners of the fee simple to allow the excavation to be taken out? I do not know what arrangements were made between the occupiers and owners. I know we made an arrangement with the owners, through Mr. J. R. Hill, to allow us to carry out the work conditionally upon our putting in a little extra work, amounting to about £600.

21599. *His Honor.*] Instead of going in for resumption, and the expense incidental to that, the department thought it would be simpler and cheaper to make arrangements with Mr. Hill to do the work with permission? Yes.

21600. Therefore certain concessions were made, of which the stop-board was one, the covering of the sewer under the sand-hills being another, and a flume across the channel where Shea's Creek is supposed to cross it being a third? Yes.

21601. *Mr. Norrie.*] It is quite a usual thing in the Sewerage Department to obtain permission to construct a sewer instead of resuming the land? Yes. For instance, we never resumed land from Mr. Cooper for storm-water channels. He has regarded the channels through his property as being so eminently to his interest that he has always given us facilities for constructing them, provided his property was not directly injured.

21602. It is quite clear that when M'Namara obtained the injunction in 1889, the injury he afterwards complained of was not anticipated? Quite so. The injunction had reference to the canal.

21603. And not to the sewerage works? No.

21604. *His Honor.*] Do you say that, so far as your knowledge of the matter goes, the failure to add the probable quantities of the earth channel was not the result of a little deliberation on the part of the office, with a view to keep the work out of the clutches of the Public Works Committee? There was no deliberation whatever except in so far as we knew that we should not be able to carry out £20,000 worth of work for £15,500, unless the contractors were of a very different mind from ourselves.

21605. What was your estimate? I endeavoured to find it this morning, but I could not succeed in doing so. It amounted to close upon £20,000.

21606. Your estimate excluded the earth channel? Yes. We got a tender a little over our estimate if I remember rightly. We knew, seeing that we had not enough money, that, before the Minister would accept the tender, provision must be made to reduce the contract. Beyond that there certainly was no thought of evading the provisions of the Public Works Act.

21607. It was only after tenders were received, then, that provision was made fixing the two points to which you have referred? Provision was made before the question was asked whether it had been made or not. When it was found that the tender was over £20,000 the Minister asked whether the contract could be reduced, and he was told that it could, but the idea of making that provision was not to bring the work below £20,000. We estimated that it would cost more than £20,000; but the reason we had for making provision for the reduction of the contract was that we had not sufficient money to carry out the full work.

21608. Provision was made for a reduction of the contract, so that you might try to keep down to the £15,500? Yes.

21609. *Mr. Norrie.*] That provision was made before tenders were called? Yes.

21610. *His Honor.*] That accounted for the two points being fixed;—if you had a certain definite sum you would have fixed upon one point, but as you had an uncertain sum you fixed upon two? Yes; that is the reason we have the two points. We thought that if we got a specially favourable tender we might carry out the whole work, down to the canal; and that if, on the other hand, we got the tender which we expected we might receive, we could eliminate the 27 chains. If, on the other hand, we got a tender between the two, we could take off the 13 chains; so that we were prepared for every emergency.

21611. Were all the papers relating to this matter returned from the Equity Court? That I cannot say. I know that during the hearing of the case several papers were mislaid, and I do not think they were ever found.

21612. I understood you to say that the order for the reduction of the contract by a sum of £3,000 came from the Ministerial branch of the department? Yes; the tender was accepted by Mr. Bruce Smith upon the condition that the contract was reduced by £3,000.

21613.

J. Davis.  
3 Nov., 1896.

- J. Davis.  
3 Nov., 1896.
21613. Who first called attention to the fact that the tender was over £20,000? The tenders would go on to the Minister, I presume.
21614. And it was in the Ministerial branch of the department that attention was called to that matter? Yes.
21615. The fact was, that there were two distinct operations going on as far as that reduction was concerned in your part of the department;—there was the money difficulty, irrespective of the question of £20,000, more or less; and then, when the tenders actually came in, and it turned out that the lowest tender was over £20,000, there was the other difficulty, which was raised by the other branch? Yes.
21616. And when the matter came down to your branch of the department, your former action fitted into the difficulty which had come down from above? Yes; that is precisely what occurred.
21617. In asking you some questions the other day about the schedule of Contract 69, I omitted some questions which I had intended to ask you; I would ask you to turn to page 76 of the Parliamentary return;—I take it that in the case of items Nos. 12, 13, 14, and 15, the words “solid rock,” in inverted commas, refer to a part of the longitudinal section? Yes.
21618. So that that defines a particular piece of country, as it were? Yes.
21619. The total quantities of the four items, 12, 13, 14, and 15, come to 1,465 yards? Yes.
21620. These pieces of excavation, I understand, are roughly estimated to be split up in this way? Yes; that would be for the shafts in the length classed “solid rock.”
21621. In the final return the quantities come out under the two heads 12 and 14, 14 being 4-inch charges of powder, at 91 and 404, the aggregate being 495. There was a difference, by way of reduction, of 970 cubic yards between the estimated quantities and the final voucher; that is what I cannot understand? It depends upon the size at which the shafts are sunk. Provision was made in this case, I think, to sink shafts up to 12 x 5, but when we came to carry out the work we had the shafts put down at 6 x 5.
21622. Do you remember that that was so? If you refer to page 97 of the Parliamentary return you will see that the shafts vary from 6 x 5 to 18 x 8. Take the Premier-street shaft. Several witnesses have said that, instead of the shaft being made 18 x 8, it was made 12 x 5. The difference of excavation between these two sizes would be included in Contract 69. No excavation, however, was carried out there in connection with that contract, and that of itself would be a big item of saving.
21623. Did that come within the classification of “solid rock”? Yes; that is the explanation.
21624. The reduction being made for the sake of economy in this case? Yes.
21625. Had you anything to do with the making out of the schedule for Contract 112, or was the putting in of the prices entirely Mr. Bagge’s work? I possibly had something to do in advising him. He generally asked my advice as to the prices, but he had the responsibility. He either adopted my view, his own, or someone else’s.
21626. One price struck me as being so low that I could hardly understand it—that is, the price of special bluestone concrete in the carrier, including the iron;—the price is set down at £1 15s.? The special bluestone concrete to which you refer involves no centering of any consequence, and that would reduce the price of the material. At the same time the price does seem low.
21627. It seems very low as compared with the estimate in the case of the Monier work? You must remember the thickness of the walls of the carrier in the case of Contract 112. You have some measurement there; but in the case of No. 77 there is a great deal of work and very little measurement.
21628. What is the thickness of the arch in the case of No. 112? Sixteen inches at the springing, and 12 inches at the crown.
21629. With a span of about 50 feet? Yes. In fixing these prices you have to take all the surrounding circumstances into consideration. What may appear to be a high price in one case would be really a low price in another case. You could not make your prices nearly uniform for even the same class of work. You must take all the surrounding circumstances into consideration, or you would be led astray.
21630. I think 50s. was the price fixed for ordinary bluestone concrete in the case of 79A, was it not? Yes.
21631. And 30s. for sandstone concrete? Yes; but that was in the tunnelling, and it was a very small sewer. Most of it was 4½ inches thick.
21632. Involving a great deal of work in comparison with the measurement? Yes. Now I come to look at the original schedule I find that the price of £1 15s. for special bluestone concrete in the case of No. 112 is a clerical error. The amount should be £2 15s.
21633. A good deal has been said about windage;—I suppose the fact is, that in constructing a large, massive, sewer like that in Contract 101, the designer would not trouble his head about windage at all? It would scarcely come in with such a big base as that; but it would have to be taken into consideration in the case of No. 77.
21634. In the departmental plan as well as in the substituted plan? Yes.
21635. In that case windage would be a considerable element? Yes; it is an element you would have to reckon with in making your calculations.
21636. In calculating the weight I suppose you take the sewage as of the specific gravity of water—you do not add anything, and I presume you also take the carrier as gorged? No; there is an overflow for the three-quarter level of the sewer.
21637. So that you take it as three-quarters full? Yes.
21638. *Mr. Parkes.*] As to the Premier-street shaft, I thought you said in your former evidence that it was excavated in a former contract—that of Carson’s? Yes; that is what I said in effect this morning. The enlargement from 12 x 5 to 18 x 8 was included in Contract 69; but it was not carried out, and consequently there was that much saving.
21639. Are you sure that the excavation was not made, although the walls were not placed in? The work passed out of my hands before it was finished; but, to the best of my knowledge, certainly not. Before I gave up the work I gave instructions that the shaft was not to be enlarged.
21640. Can you swear positively that it was not enlarged? No, not beyond what I have said. There was no alteration made in the shaft except at the top after I gave up charge.
21641. And you say that the enlarged excavation was not carried out? Yes.
21642. In your plans is there any rock shown in that Premier-street shaft? It is all rock pretty well to the surface.
21643. It is not shale? No; sandstone rock.

21644. Will you refer to item 16 in the schedule of Contract 69, "Less hard excavation in road surfaces";— is that also in the shafts? Yes; that would be in the shafts. J. Davis.  
3 Nov., 1896.
21645. That class of excavation is greatly increased, particularly in item 16? The aggregate comes out at an increase of 108.
21646. But item 16 is greatly increased; there is an increase of 170 to 539? Yes; that would be increased simply because the material classed under item 16 was found—that is to say, "Less hard excavation."
21647. It was found that you had to increase that excavation? It is the description of excavation that was found instead of rock. That accounts for the increase.
21648. *Mr. Gummow.*] As to a shaft in rock 6 x 5, what area would that be? Thirty square feet.
21649. And with regard to a shaft in soft ground where timber would be required, what area would that be? That would be 63·75 square feet.
21650. More than double the area in the case of the shaft in rock? Yes.
21651. So that for every foot of shaft excavated in soft ground you would get double the quantity of excavation paid for? Yes.
21652. And that would account for the difference? That is the reason for it. The more soft ground which was met with in the shaft the more would the aggregate be increased under that particular class of excavation.
21653. And it would be double what it would be in the case of rock? Yes.
21654. *Mr. Parkes.*] Your borings, as far as they went, clearly indicated what was rock and what was shale? They would do that certainly; but I scarcely think they would indicate the precise line between the hard rock and soft rock, and the hard shale and the soft shale. That could only be decided when the shafts are sunk.
21655. But in preparing your schedule, would you not have the notes before you? The longitudinal sections would be before the quantity surveyor, and in those sections would be shown the whole of the information available. The surveyor would use his judgment as to what to include in one item and what in another, but it would be quite impossible for him to say how the ground would turn out in the end.
21656. He would have the report of the officer who took the borings? No. All the information from the taking of the borings would be shown on the longitudinal section, and he would judge of the kind of ground through which the bore passed by the material brought up by the auger.
21657. *His Honor.*] Would the boring machine bring up a core or only broken material? In soft ground, such as clay, you might put in an auger and bring up a core, but you would not do so in hard ground. In that case the material would be punched to powder and would be lifted in that way.

## WEDNESDAY, 4 NOVEMBER, 1896.

Robert Rowan Purdon Hickson recalled and further examined:—

21658. *His Honor.*] You wish to make a statement to the Commission? Yes. Before Mr. Parkes proceeds with his cross-examination I should like to correct a statement which I inadvertently made yesterday. I had quite forgotten the circumstances connected with the reduction of the expenditure in the case of Contract 72. As a matter of fact, the question was brought before the Public Works Committee in connection with the Johnstone's Bay stormwater sewer. I had quite forgotten that. The question of the stormwater sewers was brought under my notice by a minute of Mr. Bruce Smith, dated 17th September, 1890. The minute is a long one, and I will not take up your Honor's time by reading it. R. R. P.  
Hickson.  
4 Nov., 1896.
21659. What is the substance of it? It refers to the building of stormwater sewers generally for the whole of the suburbs of Sydney in connection with the sewerage scheme. My report is rather a long one; but, to come to the point in question, the Committee, after drawing attention to my minute, in reply to the minute of Mr. Bruce Smith, say:—

To these suggestions the Cabinet assented, subject to the necessary provision being made by Parliament, and subsequently Parliament voted for these sewers £278,401 in two sums—£201,531 in the Estimates for 1891, and £76,870 in those of 1892. Of the total amount, £208,283 was for works forming part of the Western Suburbs scheme, and most of the money on those works, as on the others included in the votes mentioned, will be expended without any previous reference to this Committee, for the reason that in all instances but two the estimated cost of the sewers is under £20,000.

I may mention that all the sewers alluded to here are stormwater sewers.

The two cases in which the estimated cost of such as according to the Public Works Act makes it necessary that the works should be referred to the Committee are the sewers discharging into Johnstone's Bay, and a sewer from Munni-street, Newtown, through Macdonaldtown, to Shea's Creek. The latter, it was first thought by the authorities of the Department of Public Works, would not cost £20,000, and, under that impression, the work was commenced, and is now being carried on. It was not, therefore, referred to the committee. The sewers discharging into Johnstone's Bay are consequently the only work under the Votes so far passed by Parliament for the construction of stormwater sewers respecting which the Committee will make inquiry.

So that, as a matter of fact, so far from trying to evade the Public Works Act or to hide this matter in any way, we ourselves brought it before the Public Works Committee, showing that the cost of the work would be really more than £20,000. I had quite forgotten that circumstance when I gave my evidence yesterday.

21660. *Mr. Parkes.*] The date of the injunction obtained by M'Namara was April, 1889, was it not? Yes.

21661. And Contract No. 72 was signed on the 16th March, 1891? Yes, 1891.

21662. On 13th March, Mr. Tillet wrote this minute to the Under Secretary:—

It has just come to my knowledge that in carrying out the works of the Munni-street to Shea's Creek sewer, a part of which is along the centre line of the proposed Shea's Creek canal, and is itself an open channel, the material from the open channel is being disposed in such a position as, in the event of the Shea's Creek canal being extended to Buckland-street, the whole of this material will have again to be removed. It may be possible that this material can be so disposed as to make one moving sufficient. I would suggest that, the Engineer-in-Chief for Roads and Bridges attention be drawn to the matter.

That was sent to the Under Secretary on 16th March, the date of the signing of the contract. On that same date Mr. Davis wrote this minute:—

Before this work was commenced last week I saw the importance of not only cutting our channel in such a way that ultimately it would form part of the proposed canal, but also that the earth excavated should be so deposited that it would not have to be moved a second time. I therefore asked Mr. Boys to see Messrs. Tillet and Williams, of the Harbours and Rivers

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Rivers, and to ascertain from them what distance from the side of the canal they would require the excavated material deposited, so as to be clear of their work. Mr. Boys understood that if we kept 25 feet outside of the edge of the canal there would be sufficient room for the canal banks. I gave our contractors instructions accordingly. Since receiving Mr. Tillet's minute I have seen him, and he informs me that there will probably be an excavation 736 feet wide at the point where our storm-water channel joins the line of canal. The ground is of such a soft nature that I do not think it practicable to move our excavated material clear of the 750 feet proposed canal resumption except at great expense; and, as it does not appear that the cross-section of the excavation for the canal is definitely settled, I recommend that our contractors be allowed to go on depositing the earth parallel with the canal, leaving 25 feet from the edge of the canal for the future bank?

That is quite correct. I see that upon Mr. Davis's minute I wrote, "I should be glad if Mr. Tillet would see me about this." Apparently he did see me, because later on I wrote, "Arrangements made with Mr. Tillet as to the disposal of this material."

21663. As a matter of fact, the contractors commenced their work at the injunction line, did they not, according to the documents? Yes. Of course they had to take up the work from the bottom to get the outlet.

21664. They really commenced the work some time before the contract was signed? Work is often started before a contract is signed, but you may be sure they did not get possession of the ground until after the contract was let, at all events.

21665. They must have made considerable progress with the work to admit of these minutes being written? The tender was accepted on the 28th February, and the last minute you have read was not written until March 16th, upon which date the contract was signed.

21666. The plans are signed as made on the 23rd January, 1891? Mr. Bagge signed them apparently on that date. I suppose that would be after he had checked them, and had gone through them.

21667. If you turn to page 514 you will find a minute by you in which you say, "This tender was accepted on the understanding that the cost of the work be reduced so as to bring the cost of the work within the amount allowed, without reference to the Public Works Committee." That minute is dated 5th February, 1892, and it follows Mr. Nardin's minute of the 23rd October, 1891. It seems to have been the first intimation given to the Minister of the excess of work. Was the Minister, Mr. Bruce Smith, ever consulted about the change in the contract? I think that was set out in the minute to which I have already referred, which was read before the Public Works Committee in June, 1892. In that minute I said: "Another channel in Macdonaldtown at a cost of about £8,500 will be necessary."

21668. I was referring to the contract according to the understanding with the Minister. That was to be for £15,500, starting at the canal to be made by the Harbours and Rivers Department. I want to know whether the further portion was referred to the Minister for his authority? I am almost certain that it was, because I had authority for some years to approve of extras up to £500, and everything over £500 in the way of extras would, as a matter of course, go in some form to the Minister. I do not know where the minute is at this moment, but I am certain that it went to the Minister in some form.

21669. Then why would that minute of yours of February, 1892, explaining the need for the extra vote, be written? I think that explains itself.

21670. I find that Mr. Barling, on the 28th of October, 1891, wrote this minute:—

ON the Loan Estimates for 1890 the following votes were taken:—

Macdonaldtown Park Stormwater Sewer, from Swanson-street to Ashmore-street; thence from Ashmore-street to Macdonald-street—£8,500.

Stormwater Channel from Munni-street, Newtown, through Macdonaldtown Park to Shea's Creek—£15,500.

The work comprised in the first item is shown on the accompanying plan marked "A" to "B." It is being carried out by Messrs. Parry and Farley, and is nearly completed. The cost will be about £6,500, leaving a balance on the vote of about £2,000.

The work comprised in the second item is now being carried out by Carter & Co. Its position is shown on plan starting from point "C," and it is intended to terminate at "E," supposing sufficient funds are at disposal for the purpose, the contract being a schedule one. It was found during the progress of this work that an earthen drain was required from point "C" to "F" on plan, running along the course of Shea's Creek Canal. This work was one which it was first understood would be carried out by the Harbours and Rivers Branch in connection with the canal works, but it was subsequently decided to include the work in the Roads Branch Contract. This earthen drain will absorb £4,000 of the money, leaving a deficiency on the vote of something like £9,000. The contract of Messrs. Parry and Farley has been shown as terminating at point "B" on plan, and a small gap has been left between "B" and "D," which it is estimated will cost £1,264 to complete. This can be paid for out of the balance available on the £8,500 vote. It will be seen, therefore, that a further sum of £9,000 will be required to complete the whole of the work from "E" to "F." Of this sum £4,000 is required on account of the earthen drain referred to, and which was not contemplated when the work was undertaken, and the balance, £5,000, is required to complete the work up to "E." In other words, the £9,000 represents "extras," not contemplated when the contract was let.

It is represented that the matter is so urgent that the Minister is asked whether special arrangements cannot be made to permit of this work being proceeded with, in anticipation of further funds being voted. None of the additional sum will be required until next year. This further amount will bring the cost of the Munni-street sewer to about £25,000. [Vide Appendix J.] J.B.

That minute would show that the matter was brought before the Minister.

21671. But this explanation by Mr. Barling seems to show that this was the first notice he had received of the matter, because he says, "This work was one which it was first understood would be carried out by the Harbours and Rivers Branch," and then again, "It is represented that the matter is so urgent that the Minister is asked whether special arrangements cannot be made to permit of this work being proceeded with in anticipation of further funds being voted. None of the additional sum will be required until next year. This further amount will bring the cost of the Munni-street sewer to about £25,000." That seems to have been the first intimation sent to the Minister for his approval? I really could not say. There is no indication in that minute when he first became aware of the facts. I can only say that I have never, without Ministerial approval, exceeded my instruction to approve of extras up to £500 and no more.

21672. Can you produce any notification of the alteration of the contract with Ministerial approval? I will produce it if there be such a document.

21673. It is not among the papers sent to the Commission? Then I presume it is not to be found, and that is all I can say. To the best of my knowledge, everything was sent to the Commission. There was another matter in connection with Mr. Bruce Smith's minute as to these sewers which I might mention, and it is this—that just about this time there was an epidemic of typhoid fever in this locality, and Mr. Bruce Smith was very anxious, on that account, that these works should be pushed on as expeditiously as possible. It is probable, therefore, that this matter may have been arranged conversationally. Mr.

Barling



Barling will probably be able to enlighten you on that matter. He has a better memory than I have, and a great many of these negotiations went through him.

21674. In your evidence yesterday you said you anticipated that the injunction obtained by McNamara would be dissolved;—on what grounds did you anticipate that? I thought it was a most extraordinary thing that he should have obtained it at all.

21675. Did the Minister tell you that there was any likelihood of an arrangement being come to? The Minister did not say so. He did not know, I suppose; but it might have been expected that some arrangement would be made, because everyone concerned in the Shea's Creek work was pushing to get the work gone on with as soon as possible, and it was anticipated at that time that the injunction would not stand for any length of time.

21676. But you knew the injunction existed, and when plans were prepared you must have seen that they would interfere with the injunction? No. I took every precaution.

21677. In what way? Well, McNamara was only a weekly tenant. Therefore there was no occasion to go to him; but I went to the agent of the property, Mr. Hill, and made all the necessary arrangements with him about the carrying out of the work. If he had not agreed to the suggestions which were made the work would not have been gone on with, but he agreed to them, and therefore the work was proceeded with.

21678. How came McNamara afterwards to enforce his claim? That I cannot tell you.

*His Honor: I may say that, in summing up, Judge Owen specially called the attention of the jury to the fact that the department in making the earth channel were in no sense wrong-doers: and, taking his view of the law and the facts, he said it would look at first sight as if the department had disobeyed the injunction by cutting the canal; but, under all the circumstances, which he very carefully went into, he said it was quite clear that they had not done so, and that they were in no sense wrong-doers. It was only a question of the assessment of damages, to discover whether any legal damage had been caused by the cutting of the earth channel or the making of the storm-water channel.*

*Mr. Hickson: Perhaps, for Mr. Parkes's information, I might read a portion of the Judge's summing up. He said, "The provisions referred to had been carried out to the letter by the Government, with one exception, and that was that they put in a cement flume instead of a wooden one." In other words, that we did the work better than we were asked to do it.*

21679. *Mr. Parkes.*] You cannot produce any authority for making any alteration in the position of this contract as it was first contemplated? No, not at this moment; but, if there is such a document in existence, I will find it out and let you have it.

21680. What is the date of the report of the Public Works Committee of which you have spoken? 12th July, 1892.

21681. And the contract for No. 72 was let on the 16th March, 1891? Yes.

21682. *His Honor.*] It was not, I understand, that the matter was ever submitted to the Public Works Committee, but that it was alluded to afterwards? It was not submitted to the committee, but the whole question of the storm-water sewers, and the fact of two of them being under £20,000, was mentioned to the committee.

21683. The knocking off of £3,000 was finally done by order of the Ministerial Branch of the department for the purpose of evading a reference to the Public Works Committee, when it was found that the amount of the tender was in excess of £20,000? I will not say that it was done for that purpose, because there was no occasion to do it for that purpose. As I have already explained, the whole matter was brought before the committee, and it was not hidden in any way. The whole action of the department was exhibited to the committee. It was pointed out that there was an epidemic of typhoid fever in the district, and that, by hook or by crook, the work had to be carried out.

21684. Mr. Bruce Smith, and Mr. Barling acting under him, wished to get the thing through without any further hitch on account of the works being so very necessary; and the hitch would have been the necessity of bringing the matter before the Public Works Committee? Mr. Barling will be better able to explain that matter to your Honor.

21685. I understand that you, in your capacity as Engineer-in-Chief, had nothing whatever to do with the action taken in connection with the particular question whether or not the amount came within or exceeded £20,000? It would be decided, of course, by the Under Secretary whether a certain work should go to the Public Works Committee or not. As Under Secretary at the present time, I have before me three cases in connection with which I am going to the Minister this afternoon upon the question whether they really come within the provisions of the Public Works Act, and will or will not have to be submitted to the committee. Mr. Davis, who is the engineer for one of these works, will not know until the question has been decided by the Minister what is to be done in the matter; and at the time to which you have been referring I was in precisely the same position.

21686. You were then only managing the engineering part of the work;—you had nothing to do with the financing? Quite so.

21687. *Mr. Gummow.*] Did you know the contractors personally when they obtained Contract 72? To the best of my belief, I had not met any of the contractors until that contract was let.

21688. Did you know them before they were engaged upon this canal? I do not think so—in fact, I think the first time I ever met Mr. Carter was in that very swamp. If I am not mistaken, that is the first time I ever spoke to him. I remember going very nearly out of sight in the swamp, and Mr. Carter putting a plank down for me.

21689. That would be after the contractors got the canal work to do? Yes.

John Carter recalled and further examined:—

21690. *His Honor.*] I want you to tell me the date upon which the water was let into the section of the carrier in Contract 77, which is now filled? I could not name the particular day, but the water has been there for several weeks.

21691. For as long as three weeks, do you think? I should think so. Your Honor will remember that I spoke to you about it on one occasion, and told you that the dam had broken away. On the following morning I had the ends of the section bricked in. That would be some weeks ago. The water has been there since then.

21692.

R. R. P.  
Hickson.

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J. Carter.

4 Nov., 1896.



- J. Carter.  
4 Nov., 1896.
21692. To what depth have you filled the carrier? It is three-parts full, or more. I should think it would be up to the cover-plate. I told them to put in as much water as it would conveniently hold.
21693. It is nearly up to the cover-plates, you think? Yes.
21694. Which length of the carrier has been filled, numbering the lengths from the north-west end? The third or fourth.
21695. Could you not fix it by remembering the height of the piers? I should say it would be the fourth length.
21696. It is one which stands well up above the ground? Yes.
- His Honor: I may say, Mr. Parkes, that looking from the carrier from the outside it is impossible to tell in which length the water is, and that, I take it, is the best test of any that could be suggested.*

Joseph Barling recalled and further examined:—

- J. Barling.  
4 Nov., 1896.
21697. *Mr. Parkes.*] Do you recollect anything about the letting of Contract No. 72? Yes.
21698. Do you recollect that when it was let there was some trouble about the question of funds? I have not seen the papers for some years now, and since receiving a communication from the Commission yesterday I have not had access to the papers. The main facts of the case, however, are pretty clear in my mind.
21699. You remember that when the work was let it was proposed to keep it within the sum of £15,500? I forget what the exact amount was, but it was under £20,000.
21700. Was that done with the object of preventing the work from going to the Public Works Committee? Certainly not.
21701. Mr. Hickson, in his minute of February 5th, 1892, said, "This tender was accepted on the understanding that the cost of the work would be reduced so as to bring the cost of the work within the amount allowed without reference to the Public Works Committee";—is that so? That is perfectly true; but, as far as I can ascertain from inquiry, and can judge from what has appeared in the newspapers in connection with the proceedings of the Commission, one great fact in connection with this storm-water sewer has been overlooked—I mean the extreme urgency of the case. There was at the time this work was undertaken a typhoid epidemic, and a large number of persons were being carried off by the disease. It was especially severe in that part of the suburbs which was severed by this channel. There was, therefore, in the view of the department, extreme urgency in the carrying out of these works, and especially the work near Munni-street, it being a thickly-populated district. Representations were made by the Members for the district, and it was well-known to the department that what they stated was actually true. It was not a mere question of getting a bridge or a road, or anything of that sort. It was a question affecting the lives and health of a number of people. Mr. Bruce Smith at that time filled the office of Secretary for Public Works; and, when it was found that the work could not be carried out under the sum of £20,000, he, knowing the extreme urgency of the case—I am speaking now from memory—wanted to know whether an effective work could not be carried out to afford immediate relief to the district for a less sum of money. Mr. Hickson, as far as I can recollect, then pointed out that the work could be carried out for a less sum by omitting a certain portion of it and by making the proposed canal the outlet of the sewer. When the work came to be carried out, it was found that some mistake had been made in the levels. This was not known at the time, and, in consequence of that mistake, instead of the upper part being first carried out, the lower part was carried out. I may mention that Mr. Bruce Smith took a great interest in the question of stormwater sewers for the reason which I have mentioned; and in that connection I should like to draw your Honor's attention to a minute which he wrote upon the question under date of 17th September, 1890. It is a very important minute, and it will redound greatly to Mr. Bruce Smith's credit, and indeed will be remembered throughout his life, inasmuch as it is to the action he took in carrying out the stormwater sewers in advance of the sewerage system proper that we owe the present comparatively healthy condition of the city and suburbs. It is admitted, I think, on all hands, that the carrying out of these stormwater sewers has greatly conduced to the health of the districts affected. Mr. Bruce Smith, taking into account the fact that the sewerage works proper could not be carried out for some years, and that people in the meantime were dying off from typhoid and other fell diseases, brought about by the unsatisfactory condition of the suburban drainage, conceived the idea that the stormwater sewers could, for the time being, be made a channel for carrying off the foul water which, when the sewerage system proper was completed, would be discharged into the sewers proper. Having regard to the large and abundant supply of water which we had, he thought these stormwater sewers should be constructed, and that for the time they would take away the foul water other than faecal matter, and that by flushing these sewers the abomination which then existed in the shape of foetid matter in the natural channels might be taken away, mitigating, to a large extent, the danger of disease. As I have said before, I think that one of the laurels which Mr. Bruce Smith took away with him from the office is the recollection of his having carried out a system of sewerage which has been the means of saving hundreds of lives. It was just in the midst of the epidemic of which I have spoken, or immediately afterwards, that this matter came up, and if anything would justify a Minister in almost straining the law—as a matter of fact it was not done in this case—it would be circumstances of this kind, where the health and even the lives of a large number of people were concerned. The Minister, seeing that the full work could not be carried out, asked whether it was not possible to do something to mitigate the evil from which this district was suffering. It must be remembered that it was a district in which comparatively poor people resided. Had it been populated by a different class of people, by people in better circumstances, they could have moved into the country; but, as it happened, the people in this particular neighbourhood were not in a position to do that, and in the interest of humanity itself this work was carried out. Every succeeding Minister, I am glad to say, regarded the work in the same humane light.
21702. Then why did not the Minister, under the circumstances you have named, call for two contracts to complete the work? I am speaking now from memory; but I believe it was at first thought possible that the whole work could be carried out. Provision, however, was made in the contract that part of it only might be carried out if the entire work could not be carried out for a sum under £20,000.
21703. The department having made that provision for a variation of the contract, and admitting of a portion of the work being left out, why was the work commenced at the extreme end? I am not clear upon the engineering part of the question. I have explained why, as far as I can recollect, the alteration was

- was made. When they came to carry out the work it was found that they could not get a discharge for the sewer at the upper part, and that it was necessary to go to the lower part for it.
- 21704-5. Were you consulted about that? No; I should not have been consulted upon a question of that kind. It was an engineering question.
21706. Supposing the engineers commenced at a position which did not belong to the contract, or supposing that they wanted to do so, would you not be asked to authorise the alteration? I would not say that that was done.
21707. On 28th October, 1891, you wrote a minute with reference to this work which you will find upon page 516 of the printed evidence. I think you will see from the terms of that minute that you then had your first intimation as to the excess in the work? I cannot remember all the details because the thing happened some years ago. I have not been able to bring the exact circumstances to my mind. I cannot tell you now the precise dates upon which the excess of work would be brought under my notice. It would be impossible for me to remember that now. I have given you the impression in my mind as far as I can remember the circumstances of the case.
21708. Supposing the work commenced at the lower end of the contract, there is a clause which you yourself said you put into the contract to keep it within a certain amount of money, cutting that very portion off? I do not think I said that I put the clause in.
21709. I think you said in your evidence that you gave instructions that the clause should be put in? I do not think so. I may have said that it was arranged that a clause should be put in.
21710. Who would make that arrangement? It would be the engineers. As far as I can remember these are features of the case of which I was not aware until they were brought under my attention at the particular time to which you refer.
21711. But you knew of the existence of the clause at that date? I do not remember the exact words of the clause now, but I knew of it, because, before the contract was signed, care was taken that it was framed in such a way that a certain portion might be left out.
21712. Would it not have been wise, seeing that you started this additional work first, before you came to the contract work, if there was any necessity for alteration at all, to have eliminated the upper portion? I think power was given in the contract to eliminate any portion.
21713. Was Mr. Bruce Smith consulted about all these matters? I have no doubt he was.
21714. Do you know for certain whether he gave his consent? The contract could not have been accepted without it.
21715. Was his consent obtained to the drain which was cut down the bed of Shea's Creek? I cannot remember that, but as far as I was concerned, I always kept the Minister acquainted with everything I knew in connection with this and every other matter.
21716. Do you recollect whether you were consulted about it? I do not think so; I do not remember it.
21717. It was reported to you afterwards? It was, as far as I know, afterwards. I should just like to say one word with regard to this matter. The whole question as to this Munni-street sewer was really brought before the Public Works Committee when the proposal for the Johnstone's Bay sewer was before the Committee. I specially drew attention to the circumstances, and the Committee in their report have also drawn attention to them. After giving an account of what money had been voted for the storm-water sewers, the Committee say:—"Of the total amount, £208,283 was for works forming part of the Western Suburbs scheme, and most of the money on those works, as on the others included in the votes mentioned, will be expended without any previous reference to this Committee for the reason that in all instances but two the estimated cost of the sewer is under £20,000." The Committee then proceeded to refer to the sewers, which were the sewers discharging into Johnstone's Bay and the sewer from Munni-street, Newtown, through Macdonaldtown to Shea's Creek, and it was pointed out that the latter work was not at first estimated by the authorities of the Public Works Department to cost £20,000, and that under that impression the work was commenced and was being carried on, it not having, for that reason, been referred to the Committee. It will be seen that the whole of the particulars were brought out before the Committee, and that there has been no attempt whatever to burke the question.
21718. The portion of the report to which you refer is only a repetition of your explanation? Yes; all that I am insisting on is that the thing was brought out. There was not the slightest attempt made to keep anything back.
21719. *His Honor.*] The explanation, I understand you to say, was volunteered to the Committee? The Committee did ask me a question in reference to the matter, but my minute, dated the 28th January, 1892, in which I referred to it, was brought out on my own motion. It was not asked for. My minute was in these terms:—

## Minute Paper—Storm-water Drains, Western Suburbs.

Department of Public Works, Sydney, 28 January, 1892.

MR. HICKSON has frequently brought under attention the necessity for coming to a determination with regard to the question of the storm-water sewers, which may be looked upon as accessories and subsidiary to the main sewerage scheme for the Western Suburbs already approved by the Public Works Committee. In 1891 the amounts shown on the attached list were voted for the purpose of carrying out storm-water sewers in the several localities named, but it appears that in two instances the cost will exceed the sum of £20,000, viz., the Munni-street sewer by £6,000, and Johnstone's Creek by £18,200. These are the only cases which can be ascertained at present where the £20,000 limit will be exceeded.

The question, therefore, arises as to whether, under the terms of the Act authorising the construction of the main Western Suburbs Sewerage Works, we can include these particular sewers, viz., the Munni-street sewer and the Johnstone's Creek channel. Mr. Hickson points out that the storm-water sewers are an essential to, and really form part of, the main sewerage scheme.

The sum of £1,143,592\* has been voted for those portions of the works to be constructed by the department, and by the 16th section of the Public Works Act the constructing authority is authorised to carry out the works, provided they shall not exceed in the aggregate more than 10 per cent. of the estimate submitted. Ten per cent. of the amount voted for works to be carried out by the department will amount to £114,359, and, judging from the cost of the works already executed and in course of execution, Mr. Hickson thinks that this sum will be ample to cover not only any extras on the contracts, but the cost of these storm-water sewers also.

I

\* Amounts voted:—

|   |          |
|---|----------|
| Loan Act, 1889—Western Suburbs—Main scheme .....  | £830,000 |
| Loan Act, 1891—Completion of Western Suburbs Sewerage Scheme (Schedule B of Act 54 Vic. No. 17) ..... | 313,592  |

Total..... £1,143,592

J. Barling.

4 Nov., 1896.

I have, therefore, to submit to the Minister the question whether we are not justified in at once proceeding with these works, and to point out that the Public Works Committee, in their report upon the whole subject, make the following remarks (page 10, paragraph 13):—

“Storm-water may cause considerable difficulty in any system of sewerage, and the subject has not been overlooked in the present proposals. Overflow weirs will carry off any excess of storm-water; or, if necessary, at some future time, relief sewers can be provided, and the small quantity of sewage contained in storm-water so discharged into natural water-courses would be so greatly diluted, it is considered, as to render it perfectly unobjectionable. The provisions for storm-water would not be sufficient to prevent flooding in a portion of the Marrickville Valley, and for the effectual draining of that locality from any excess of storm-water certain special works would have to be carried out. The same thing would probably be necessary in some other localities.”

It is clear, therefore, that the Committee contemplated the carrying out of such works.

In conclusion, I would point out that the work is of such extreme urgency that it hardly admits of a day's delay, and, further, that in the event of Mr. Hickson's calculations proving incorrect as to the cost of the works, there will be ample opportunity of bringing the whole subject before the Public Works Committee before we have actually exceeded the amount authorised, as the works will occupy many years in completing—probably ten at least.

J. BURLING.

I was summoned before the Committee, and I gave my own statement, my minute being included in that statement of the facts. I think that the more the question is investigated the more it will be seen that credit attaches to the department for meeting the urgent necessity which existed for the construction of this storm-water sewer. I do not hesitate to say that hundreds of lives were saved by reason of the action of the department in the matter of storm-water sewers.

21720. The Committee did not in any way find fault with what had been done? No. Had I myself been in the position of Minister I should have considered the carrying out of these storm-water sewers, to which I have referred, one of the best feathers in my cap. I feel very strongly upon the question, and I should like to draw your Honor's attention to the minute by Mr. Bruce Smith, which I also laid before the Committee. I do not know whether your Honor would like me to read the minute?

21721. As it may be thought that Mr. Bruce Smith went out of his way to evade the operation of the Public Works Act, I think that it is fair that the minute should appear as part of the evidence? It will be seen that what Mr. Bruce Smith did was certainly not in the way of evading it. His minute is as follows:—

Minute Paper—Storm-water Drainage.

Department of Public Works, Sydney, 17 September, 1890.

As the Commissioner for Roads is aware, I have been considering the question of hastening on the sewerage works of the city and suburbs, the subject being one of the gravest concern, as so largely affecting the health of the citizens. After going fully into the matter, I am satisfied that Mr. Hickson is doing his utmost to press on with the work, but I cannot disguise from myself the serious consequences following the delay which must necessarily take place before these works are completed; and I have therefore been carefully considering whether something cannot be done quickly to (in a measure) mitigate the evils which are constantly resulting from the want of a proper sewerage system, more especially as regards the western suburbs. These districts are growing with great rapidity, and the evils I have referred to are becoming intensified in a corresponding degree, but the scheme now being undertaken cannot, I regret, reach them for some years to come. It has, however, occurred to me that some measure of relief might be obtained by carrying out quickly what will eventually form the “storm-water” portion of the general scheme. At present the watercourses which serve to carry off storm-waters are almost entirely in their natural state, and are the receptacles of the sewerage of the large populations which have settled in these suburbs, becoming in consequence a series of fetid pools which menace the health of the whole population. If these storm-water sewers can be at once constructed they can be utilised for a time for the more rapid and satisfactory discharge of the sewage matter, which must of necessity, under present circumstances, find its way into them, and thus, I feel sure, be the means of preventing a large amount of sickness.

We have now an abundant water supply, the capacity of the Nepean scheme being something like 50,000,000 gallons per diem. The normal consumption is about 10,000,000 gallons per diem, and the present pipe-line will deliver about 18,000,000 gallons per diem, which will be nearly doubled when the second pipe-line, about to be put down, is completed. Taking into account this large reserve of water, there can be no difficulty, I imagine, in utilising it in flushing down these proposed storm-water sewers; and, indeed, it cannot, I think, be put to a more profitable use. Of course, as soon as the sewerage system proper is complete, these drains will revert to their intended use, *i.e.*, channels for the conveyance of storm-waters only. One thing which must, however, be carefully avoided is, that under the term of storm-water sewers we are not led into carrying out what is practically municipal work, and not coming under the designation of storm-water sewers proper. It will, I apprehend, be easy for the municipalities to make temporary connections with the storm-water drains, and so render them effective for the purpose I have suggested.

I therefore wish Mr. Hickson to at once take this matter into his most serious consideration. The surveys necessary for the work I have already authorised to be carried out. What I desire him to do is to push on with these, and give an estimate of the cost; I will then do my utmost to obtain the necessary funds, so that tenders can be invited. Every possible endeavour should be made to carry these instructions into effect, delay, as I have already pointed out, meaning the sacrifice of health and life. I can see clearly that the municipalities in these matters are almost powerless; it is only the central authority which can effectually deal with them. The cost will, of course, form a part of the sewerage debt, and I feel convinced that both my colleagues and Parliament will bear me out in every effort I may make to ameliorate the serious condition of affairs which now exists in our midst for the want of a proper system of sewerage. I rely upon Mr. Hickson to give energetic effect to these instructions so far as it lies within the scope of his branch; and I hope by next summer, at all events, a large portion of this system of storm-water drainage may be in operation.

Before concluding, I would desire to draw attention to some passages from the speeches of Drs. Maclaurin and Ashburton Thompson, in regard to the sewerage of these districts, which were made at a meeting of the representatives of the various municipalities held at this office on the 6th December, 1888, and which speak very eloquently for themselves:—

*Dr. Maclaurin* said:— \* \* \* “It was impossible to go on as we are doing at present, as the population was increasing so rapidly that the present state of matters could not continue without causing great inconvenience. It was scarcely necessary to bring forward any arguments in this connection from a sanitary point of view, as it was well known what injury would arise from an accumulation of foul waters in many ways, and particularly by contaminating the water supply. The evil results of the accumulation of faecal matters show themselves in two ways—first, by the existence of typhoid fever, and, secondly, by the high rate of mortality of young children under 5 years of age. With respect to both of these matters, it is very clear that the health of the suburbs is not what it might naturally be expected to be.”

*Dr. Ashburton Thompson* said:— \* \* \* “You know how prevalent typhoid has been for many years; but you may not, perhaps, have sufficiently observed that the importance of this disease is not to be measured by number of deaths alone, but also by the number of non-fatal attacks of sickness, and best of all by the ages of the persons seized with it. I can tell you that here this prevalent and fatal disease attacks by preference, roughly speaking, persons between the ages of 15 and 35—persons, that is to say, at ages when their usefulness is highest, their ordinary liability to death lowest, and when their sickness causes the greatest pecuniary loss to the community. But this is not the only disease of this kind from which we suffer very heavy losses—diphtheria, diarrhoea, cholera, and dysentery, are others of the same kind, and all of them are preventable diseases which, under the most favourable conditions, might almost be abolished. Now you are asked to join in spending money; and many things in the world have to be brought to the test of the pocket. Even in matters of life and death we have to consider profit and loss, ways and means. I am afraid I cannot show that the money you are now asked to spend on behalf of your individual municipalities will clearly return a profit to your individual coffers; but I think you must be ready to admit that a life saved is, in reality, money saved, and above that, that a diminution in the average annual number of days of sickness (such as sewerage will undoubtedly result in) is a real and great pecuniary saving. You see a saving of seven days sickness per annum per head upon 52,000 males, means, in fact, a saving to the community in one year of all the profit and advantage derivable from 1,000 years of toil for every single year that that reduction

reduction is effected in that population. Now, the prosperity of nations is correlative with the prosperity of its parts—say of its municipalities. I do not wish to push this argument too far, but if you spend money in reducing sickness—and you will spend it to that end if you spend it on sewers—I think you will, on reflection, see that this expenditure—this bread cast upon the waters—will at last be returned to you.”

Mr. Hickson.—J.B., 17/9/90.

BRUCE SMITH.

21722. In the absence of that minute it might look as if there had been a contemplated evasion of the Act? Quite so; but there was not. It is a cruel injustice to Mr. Bruce Smith to insinuate that he ever attempted to evade the Public Works Act.

21723. *Mr. Parkes.*] The questions I asked were whether you and Mr. Bruce Smith had been informed of the way in which the contract was being carried on? I have no doubt the Minister was informed; but it impossible for me to remember all the circumstances now.

*His Honor:* I may say that I certainly would have called Mr. Bruce Smith in reference to this matter, but he has endeavoured to remember, but finds that he cannot do so after all these years, what really did take place.

*Mr. Barling:* I know that his earnest attention was given to the whole matter of mitigating, as far as possible, the terrible state of affairs which existed in Sydney at that time.

21724. *His Honor.*] I understand that the financial part of the business did rest in your part of the office more than in the engineering branch? I do not know in what direction you mean. I think I explained to your Honor before that I had nothing to do with the vouchers. They did not come to me at all. The heads of the branches are direct accounting officers, but matters of policy would certainly be dealt with by the Minister in concert with me. All that I can say—and I am only too pleased to say it—is that I went heart and soul with Mr. Bruce Smith in this matter, and I feel that in assisting him in it, to the extent to which I did, I have earned in some degree the gratitude of the community. I feel very strongly upon the question, because I myself know what it has been to suffer from the want of works of this kind.

21725. *Mr. Parkes.*] Would the Chief Engineer at any time carry out unauthorised a piece of work in excess of the contract amount? If there were any serious departure from the contract it would undoubtedly be his duty to bring the matter before the Minister.

21726. *His Honor.*] You cannot recollect, I suppose, whether special mention was made of the earth channel at an early stage of the work? I cannot exactly fix the time, and it is not to be wondered at, seeing that the matter transpired so many years ago.

21727. You know nothing of how it came about that the quantities appertaining to the earth channel were not added to the quantities shown in the schedule of the contract? No; I could not go into that matter. It would be utterly impossible for me to do so. There are something like 5,000 contracts in the Works Department in the course of a year, and there is, of course, a large and expensive staff to deal with all such matters. If the Under Secretary were the finest engineer in the world he could not give attention to such details. If my attention had been directed, for instance, to the question of the bluestone pitchers in the schedule of Contract 69, I should have been quick enough to ask for an explanation; but, as I say, I was not at the time aware of it, and it would be unreasonable to expect me to be aware of it. My attention was not directed to it, and I knew nothing about it.

Christian Hermann Ohlfsen-Bagge recalled and further examined:—

21728. *Mr. Parkes.*] Did you make up the schedule for Contract 72? It was made out in the office. The schedules are always re-checked by me.

21729. Had you plans before you when the schedule was made up? Yes.

21730. Could you identify the plans? I think so.

21731. Had you a plan or a tracing before you when the schedule was made up? We had the original plan.

21732. Would the tracing now before you be a copy of it? This looks like a copy of the plan, but it is not the contract plan.

21733. What was the portion on the original plan for which you took out quantities? I think the quantities were taken out from Shea's Creek to the bottom of Munni-street.

21734. Was that the complete contract? Yes; I think so. I am sure of it.

21735. Do you recollect anything about the carrying out of the contract? Mr. Davis took me there several times.

21736. Was Mr. Davis the supervising engineer? Yes.

21737. Where did you see the work going on? I think I saw the work going on over the whole line, more or less. I have been over the line several times. I could not tell you now exactly how many times.

21738. Do you recollect putting a clause in the specification, to the effect that thirteen or twenty-seven chains might be cut off if the department found that it had not sufficient money with which to carry out the whole work? Yes.

21739. Under whose instructions did you put in that clause? Under Mr. Hickson's.

21740. Did he give you the instructions himself? Yes, verbally; and I put in the clause accordingly.

21741. Why did you fix the two points which were named? It is rather a complicated affair. It happened a long time ago, and it is hard for me to speak definitely about it; but to the best of my belief the plan was drawn upon the supposition that the ship-canal would have been completed when we started the work. When pressure was brought to bear upon the department, and we were ordered to proceed with the work, it was found that the canal had not been constructed. It was, therefore, very difficult to get an outlet. We could not let the water run into the swamp, because it might get into various races below and cause trouble. I rather think it was before tendering—that we found that the contract would exceed the sum which we had available for this work. It was then decided that I should put in a clause giving us the option of leaving out a certain portion—I think from Shea's Creek to Mitchell Road—in the event of sufficient money not being available.

21742. Why did you take these special points? We intended first of all to start from Shea's Creek. Every storm-water channel is generally started from the outlet end, so that we may work against stream. Then, if flood-water comes down, no harm is done. The outlet at the end being closed up on account of the ship-canal's not being built, other outlets were taken into consideration, at Mitchell Road for instance. There is a usual clause in contracts allowing a reduction of any part of them; but this clause was specially put in on account of the difficulties which arose when Mr. Hickson saw there was no chance of the canal's being cut.

21743.

J. Barling.  
4 Nov., 1896.

C. H.  
Ohlfsen-  
Bagge.  
4 Nov., 1896.

C. H. Ohlfsen-Bagge.  
4 Nov., 1896.

21743. Do you recollect when the earth channel was added to the plan? It is very difficult to say. I have been thinking over the matter, and I have been reading through some of the correspondence to see what I could make of the affair. It looks to me to be a little confused. I should think, however, that the information you want could easily be ascertained. I saw, for instance, a minute from Mr. Barling, in which he stated that during the construction of the work it was found that there was no outlet, thus necessitating the construction of the earth channel at the end of the contract. I think Mr. Barling is right there. I recollect its being discovered that there was no outlet at Mitchell Road, and that once, at a time of heavy flood, Mr. Davis took me out and said, "This channel, through which it was intended to let the water run, is all silted up. After all, we shall have to finish down to the ship canal site; we cannot get rid of the water otherwise." When it had once been decided to build down to the canal site it became a necessity to cut an earth channel within the width of the proposed canal.

21744. *His Honor*] If you remembered the fact that the work was actually begun with the earth channel—that that was the very first work done—would not that put a different aspect upon the matter? Upon that point I cannot agree with what has been said. I cannot recollect that the earth channel was done first. To the best of my belief the contract had been started when the contractors received a notification from the department that their tender was accepted, and it may have been some time afterwards that the bond was signed. That is the only way in which I can explain it.

21745. *Mr. Parkes*.] Do you not see, on reference to the minute of Mr. Barling to which you have referred, that the first work done must have been in connection with the earth channel? I see Mr. Barling says in his minute, "It was found during the progress of this work that an earthen drain was required."

21746. That must have been the first intimation which Mr. Barling received of the matter; but have you read Mr. Tillet's minute of 16th March, 1891? I have seen the minute; it is possible that the contract was started on receipt of the notification of acceptance. Mr. Barling's minute is in distinct agreement with my recollection of what occurred as to the earth channel.

21747. He must have got his information at a later date? No, the information would be laid before him at the time when the necessity of cutting an earth offset channel arose.

21748. Is it possible that they did a portion of the upper work and afterwards the earth channel, and that the two portions were subsequently connected? Yes, and I believe they worked from Mitchell Road upwards and that the work was stopped when it was found that the stormwater would do mischief on account of there being no outlet. My impression is, that on that's being discovered, the earth channel was proceeded with. When the discovery was made I am inclined to think that the contractors were at work on the upper portion of the job—that is, on the portion above Mitchell Road.

21749. Were you out on the ground in the early part of the work? I was out there several times, and I am under the impression that the upper portion was in course of construction before the outlet end of our channel and the earth channel were commenced.

21750. Did you estimate in your original quantities the excavation of the earth channel? That I think must have been an after consideration. We also thought that the earth channel when constructed would be paid for by the Harbours and Rivers Department.

*His Honor*.] *Perhaps if Mr. Bagge were to look at the journal it would refresh his memory as to the point at which the work began.*

21751. Having looked over the journal, what is your impression as to the point at which the work commenced? As far as I can see the journal does not prove that the work started at the earth channel.

21752. How long was it after the work had been started when you first went out there? That I could not tell.

21753. Do you recollect whether, in taking the quantities off the plan, you calculated in those quantities the earth channel? Unless I saw the quantities it would be difficult for me to say. My impression is that the earth channel was an after consideration.

John Carter recalled and further examined:—

J. Carter.  
4 Nov., 1896.

21754. *His Honor*.] Do you remember when you tendered for and obtained Contract No. 72, what it was for which you really tendered? Yes; I remember that when we got the contract I went out with Mr. Snodgrass to the site of the works. I had not been there previously, and Mr. Snodgrass took me down to what has been spoken of before the Commission as the injunction line below the Shea's Creek swamp. We walked through the whole of that morass, and I remember that the reeds were 8 or 9 feet high. We walked up the line marked out for a canal, and I recollect that we had considerable difficulty in walking through the swamp. It took us two hours to walk through. That is conclusive proof, to my mind, that that portion of the work was included in the contract, although I do not remember the quantities. It is not at all likely that we should have walked through that swamp unless we had something to do there.

21755. Would it have been possible at all to open the lower end of the concrete channel into the swamp without making a cut? No, decidedly not.

21756. The levels would not allow of it? No.

21757. You would have been some feet underground? Yes. I know that in one or two cases, until we got an outlet, we had to pump the water out of the excavation.

21758. At the very end, what was the difference between the level of the swamp and the level of the bottom of the concrete channel? It was a matter of feet.

21759. How many feet do you suppose? Two feet, anyhow.

21760. What was the depth of what is known as the earth channel? 5 ft. 6 in.

21761. Did it run about level with the bottom of the concrete channel when it was excavated? It would be practically level with the invert of the concrete channel.

21762. So that the invert would have been so much underground if the earth channel had not been made? Yes.

21763. The swamp runs nearly level—the fall is very slight? Yes.

21764. So that without the channel it would have been quite impossible to make an outlet at that point? Yes.

21765. Do you remember the alternative outlets? One was near Mitchell Road. We could see that here was no outlet there.

21766.

21766. If you began your work at the very bottom, that would not have been considered? No. I remember standing under the bridge one day, and we saw that that point was of no use as an outlet.
21767. That is what is known as Macdonaldtown Creek? Yes.
21768. Which portion of the work did you start first of all? The earth channel. We cut a channel to drain the surrounding ground, and then we began at what is said to be Shea's Creek. That is where we began with the excavation for the concrete channel.
21769. Between the time your tender was accepted and the time the work began, what delay was there—do you remember? There was no delay as far as I know.
21770. Was there any deliberation in which the contractors were consulted;—was there any question put by the contractors to the department as to what the contract was to be considered to be? No; I do not recollect any.
21771. As far as you recollect, was it taken as a matter of course? We went into the contract, as far as I know, just as we would go into any other contract.
21772. Just as if the work upon which you began had previously been in it? Yes. I remember no question or hitch of any sort.
21773. As far as you can remember the question of whether a proviso should be put in was not considered? Not so far as my recollection goes.
21774. Whatever had been done about that matter of the proviso had been really settled before your tender was accepted? I should think so.
21775. *Mr. Davis.*] It was evident to you when you went over the ground that there was no outlet in Mitchell Road? Quite evident. If there had been an outlet at Mitchell Road we should have been glad to use it temporarily, at all events, to keep the excavation dry.
21776. Will you look at the longitudinal section and tell me to what extent the invert of the channel is below the bed of the creek at Mitchell Road? 4 ft. 3 in.
21777. *Mr. Gummow.*] You did not start the work of the contract from above Mitchell Road? No; we started the work at the lower end. We got as far down as we could get.
21778. *His Honor.*] What have you to say about the value of the stuff, per cubic yard, which you took out? We had a fair price for it. There was nothing extraordinary about it. In those days the tender rate was almost the market rate. We were all on the same footing. I do not think 2s. 6d. was by any means an exorbitant price. I remember that in many places in the canal the men practically stood still for three weeks or more. They were constantly working and wheeling without getting a yard further ahead. The stuff kept running in as fast as we took it out.
21779. Did you take out a lot of stuff beyond your measurement? Yes; I remember Mr. Snodgrass saying "I do not know whether it was brought out before the Commission, but you would be quite safe in saying that we lost 10,000 yards of excavation upon that contract." I know that there was one particular place on the contract where we had to pull Chiene out with a rope. I know that at several places, for weeks and weeks, we were working for nothing. We were getting the stuff out, and it was running back again. I think the price we had for the contract was just about a fair one taking it all through.
21780. Mr. Snodgrass, I suppose, made out the tender as usual;—did he or did he not mention to you that the department must have made some big blunder in the schedule of quantities as to the excavation? No; he did not. I am quite certain of that. I think that in this case the tender was made out rather hurriedly. I do not think Mr. Snodgrass adopted his usual method in making it out.
21781. As far as you know he must have taken the probable quantities as though they were correct? I am positive from what transpired that he took whatever was in the schedule. He took out no quantities for this particular contract. He must have assumed that the quantities in the schedule were correct. He would have had no motive in putting an extra price upon the excavation or anything of that kind. He put in an average price for the whole lot.

J. Carter.  
4 Nov., 1896.

TUESDAY, 10 NOVEMBER, 1896.

Joseph Davis recalled and further examined:—

21782. *His Honor.*] As to the 12 square yards of probable quantity which appeared in error in connection with the bluestone pitchers in the schedule of Contract 69—on looking through the schedule it struck me as probable that there had been a transposition between the numbers appropriate to sandstone pitchers and the numbers appropriate to bluestone pitchers. Have you gone into the question to find out what the proper quantities of the sandstone pitchers and bluestone pitchers respectively would be? Yes. The only sandstone pitching shown on the drawings is on drawing No. 12, in connection with a culvert at 2 miles 51 chains 11 links on the Illawarra Road. It is there shown that there are to be 6 feet of pitching at each end of the culvert; and, taking the width of the pitching shown, 8 feet 6 inches, it would work out to close upon 12 yards. That appears to correspond with the 12 yards which is put opposite the item of bluestone pitchers. The bluestone pitchers shown on the drawings originally would work out to about 38 square yards, and 38 square yards has been put opposite the item of freestone pitchers. So that, while I have not succeeded in finding in the quantities anything to confirm your Honor's opinion, still it does seem to be a very remarkable coincidence, to say the least of it, that these probable quantities should have been put opposite items Nos. 36 and 37 as 12 and 38 yards, and that the numbers so placed should agree respectively with the quantities for freestone and bluestone pitchers as provided in the contract.
21783. So that it really looks reasonable to suppose that the foundation of the error lay in a transposition of quantities? That certainly does seem to be the most reasonable solution of the mistake. I have found the original quantities, and there is no mention made in them of bluestone or sandstone pitching, so that they do not help us.
21784. The pitchers were not worked out in the draft quantities you have found? No. I found these quantities this morning among some old papers, and I find that neither the bluestone nor freestone pitchers are given.
21785. Can you account for their not being given? The only reason I can suggest would be that no calculation of any consequence would be required—that is to say, one could make in one's mind the calculation necessary to arrive at the probable quantities to include in the schedule.
21786. I suppose the quantities would be given at the nearest integer to the result? Yes; they would not go into decimals.

J. Davis.  
10 Nov., 1896.



- J. Davis. 21787. As to the way in which the bluestone pitchers were shown on the plan, they are apparently to be put round the manholes of certain shafts;—I should like you, having examined the plans, to explain that?  
 10 Nov., 1896. To begin with, the specification provides that the whole of the manhole covers are to be pitched with bluestone pitchers.
21788. That is the way in which you read that clause in the specification? Yes.
21789. Which may mean, however, the way in which the pitching is to be done, may it not? Yes. The specification explains the way in which the pitching is to be done round certain covers, such as manhole covers, ventilating covers, and street boxes, so that I regard it as indicating that these covers are to be pitched, the clause simply stating how they are to be pitched.
21790. But that clause would not distinguish in any way between one set of manhole covers, or whatever it might be, and another;—you will remember that, when the question arose whether the shafts should have these bluestone pitchers round them, Mr. Hickson, in his minute, distinguished between those which were shown to be pitched and those which were not shown to be pitched with bluestone pitchers;—how do you explain that? In the original drawings some of the shafts were shown to be pitched and others were not. Only a few were shown not to be pitched, and I should imagine that even that was an accident on the part of the draftsman, because it was certainly intended that the whole of the shaft coverings should be pitched. Mr. Hickson took advantage of that, and he decided that the pitching was to be carried out only where the drawings showed it, and in no other cases.
21791. In what way are the pitchers shown in the drawing? In the cross-sections of the shafts the pitchers are shown in section, with a black line running outside of the pitching, the section being coloured with Prussian blue.
21792. Is that blue colour known and accepted to be the indication of bluestone pitchers? Yes.
21793. I have not been able to find any interpretation of colours upon the plans;—is there a regularly accepted scale of colouring? Yes; there is a uniform practice in the office with regard to colouring. There is no interpretation of the colours which are used in ordinary sewerage work, but in the case of ironwork the specification states what is cast-iron, what is wrought-iron, and what is gun-metal. There is no index of the colouring in the ordinary sewer work. There are really so very few materials that it would be almost impossible to make a mistake. For instance, there is bluestone concrete, sandstone concrete—which, by the way, would not be shown, I think, in the case of this particular contract—brickwork, and bluestone and sandstone pitching; excepting, of course, the ironwork.
21794. I believe  $36\frac{1}{2}$  was the number of yards of bluestone pitching actually paid for in the final voucher of Contract 69? Yes.
21795. That was in excess of the quantity that would be shown by the number of shafts clearly indicated to be surrounded with bluestone pitchers? Yes.
21796. Do you know how that came about? To the best of my belief it arose in this way—while the original drawing did not show bluestone pitchers, the supplementary drawings sent out by the office during the progress of the work showed that these pitchers were to be put in, and the contractors carried them out accordingly. The minute which Mr. Hickson wrote seems not to have been acted upon in that respect, as far as the draftsmen were concerned. The contractors carried out the pitching as they were ordered to do in the supplementary drawings.
21797. And there was about  $1\frac{1}{2}$  yard difference between the  $36\frac{1}{2}$  yards and the 38 yards, that being, I suppose, the quantity of pitching which would have surrounded the one shaft which you have mentioned as being left unpitched? I think 38 yards would be about the quantity, if the whole of the shafts shown on the original drawings had been carried out by Carter, Gummow, & Co.; but two or three of the shafts—I think three of them—were, as has already been explained in the evidence, constructed by Mr. McSweeney, and those shafts would not, therefore, have to be pitched under Contract 69, and the quantity would be reduced in that way. Then again, during the course of the contract, there were some shafts which were altered, and supplementary drawings were issued; in those supplementary drawings pitchers were shown, increasing the quantity over and above that which I stated in my minute—which you will find upon page 125 of the Parliamentary Return. I there say, “The quantity likely to be used, if the whole of the manholes are to be pitched, will be 35 square yards.” That quantity, for the reason I have explained, was increased to  $36\frac{1}{2}$  yards.
21798. But how was it that 38 yards was originally the appropriate number—I suppose a cutting down took place? The number was cut down in consequence of Mr. McSweeney having carried out certain shafts, including the manholes, to expedite the construction of the Marrickville to Burwood railway.
21799. The changes which were afterwards made, as I understand, would have been made after Mr. Hickson had given up charge of these works? To the best of my belief, yes. I would not like to say positively because I have not looked into the matter. I am pretty confident, however, that that is the case.
21800. At what stage of sewer construction does this work usually come in? At the end.
21801. At the very end or towards the end? Towards the end. It would be almost the last work done. It is usually done in the maintenance period. At the same time, in shallow shafts, where there may be short tunnels, and, again, in man-holes in open cuttings, the work would be carried out early in the contract. The shafts would be pitched as soon as they were constructed.
21802. The object, I presume, being to get rid of the obstruction caused by the hoardings? Yes, to finish off the street, so that the traffic may be turned on to it.
21803. As long as the hoardings are there the pitchers would not have been put down? No.
21804. There was one little question which occurred to me in connection with Contracts 72 and 75. First of all, as to the numbering of these contracts. I should like to know what is the principle upon which they are numbered? They are numbered in the drawing office as the designs are being made. The chief draftsman usually arranges it under the present management; but formerly Mr. Bagge used to give the numbers himself to the chief draftsman. The chief draftsman, in preparing the drawings, would want to know what number was to be put upon them. Mr. Bagge would then give him the number, and that would be the number of the particular work.
21805. Would that number depend upon the order in which Mr. Bagge had given out instructions for drawings? Yes. It would not necessarily be the order of the work at all.
21806. It would show then that the drawings for No. 72 must have been given out before those for No. 75? It is very likely, because that would be the first work to be designed. No. 75 would have no outlet until No. 72 had been carried out.
- 21807.



J. Davis.  
10 Nov., 1896.

21807. Just above No. 75 is No. 55? Yes; that was carried out first.

21808. And then there are some high numbers? Yes. That was due to the works having been carried out higher up the creek before the lower portion was carried out at all. Then the higher portion had to be altered a little, and the high numbers came into that. I know the circumstances to which your Honor refers.

21809. There was a gap between No. 72 and No. 75, which, I think, is mentioned in Mr. Nardin's minute, and which, I understand, was not part of either Contract No. 72 or No. 75 originally. It was computed that the work would cost £1,264 upon the basis of the work in Contract No. 72? I am under that impression—but I should like to look at the drawings before committing myself to the statement—that No. 75 commenced where No. 72 terminated.

21810. If No. 72 and No. 75 did not close, then for some reason No. 75 was drawn short, because No. 72 was intended to join on to some contract? What was not constructed in No. 72 was constructed in No. 75.

21811. Was the piece of work spoken of by Mr. Nardin done as part of the work in Contract No. 72? I do not quite know. I cannot speak positively upon the point. The thing occurred such a long time ago. I will look at the plan of Contract No. 75, and I can then say definitely what was done.

21812. Darcus, in his evidence, spoke of a lot of unnecessary concrete filling being put into the Premier-street shaft in the excavation which was not afterwards required, but which had been partly done, instead of ordinary earth or stone filling, which, according to him, would have been sufficient;—do you know anything about that? As far as that shaft is concerned, it was not increased in size from the 5 feet by 12 feet originally sunk by McSweeney.

21813. But it was not built up to the excavation? Yes, the shaft was rather neatly sunk. It was 5 feet by 12 feet, and there was a 9-inch lining of concrete put inside the excavation.

21814. It was not increased to 8 x 18? No, it was not increased in size.

21815. At that rate Darcus must have been talking about the ordinary filling? I do not know what he had in his mind, but in regard to this shaft there was most certainly no unnecessary filling there.

21816. Was there at one of the other shafts? No; at the other shafts there was ordinary earth filling. The shaft was built up in the centre or side of the excavation and the space behind was filled in with earth.

21817. In the case of the lining of the shaft being smaller than the shaft itself, which frequently happens, I believe, is it ever the practice to fill in with concrete behind the lining? Formerly the large shafts used to be lined with brick, and the packing between the brickwork and the excavation was sandstone concrete.

21818. That, I understand, was in narrow spaces? Yes; but in the shafts as carried out upon Contract 69, with the exception of Premier-street, which was lined in the way I have described with a small lining of bluestone concrete, the shafts were small, very much smaller than the excavation itself, and between the brickwork and the excavation there was ordinary filling.

21819. So that you do not know what Darcus would be alluding to? I do not know whether he had in his mind the chamber. I cannot quite call to mind the answers he gave.

21820. I was referring to his answer to Question 2162, as to the substitution of a small chamber. Darcus gave this evidence:—

2162. When that drawing was substituted the spiral stairways of stone were taken out and iron ladders were substituted in a comparatively small shaft? After the excavation for the larger chamber, not including the stairway, had been made it was found that a great deal of space had been shot out which had to be filled in with concrete. The ground had been shot out, and when the altered plan came in of course it had to be filled in.

2163. What then took place? The excavation was filled in with concrete, and the contractors, I suppose, were paid for the excavation and for the extra filling.

Can you say whether there was, in point of fact, a lot of extra filling there? There was a little extra filling there, but not unnecessary filling. It arose in this way: The excavation for the shaft-chamber at Premier-street was taken out at the time it was decided to substitute the one for the two sewers, and the internal dimensions of the chamber where it was decided to make the alteration had necessarily to be reduced to some extent—not to any great extent, but to some extent. Previously provision had been made for four sewers to discharge into the shaft-chamber into three sewers on the lower side of the shaft-chamber.

21821. Three sewers being the outlet for the discharge into the chamber of four? Yes. It was proposed in the alteration to put in a larger sewer to take the place of two of the smaller ones, and that necessitated a slight alteration being made to the chamber, but not to any great extent. I should like to point out, however, that Darcus is not consistent in what he says, because, first of all, he says that an unnecessary quantity of bluestone was put in, and he then goes on to say that upon one occasion he considered that the concrete that was being put in was not sufficiently rich for the work, and requested that better concrete should be sent down to him, which, I need scarcely say, was quite out of his province, because the contractors were supposed to be carrying out the specification, and it would not be likely that they would alter the quality of the concrete.

21822. I understood Darcus to refer to the way in which the concrete was made up, and not to the description of concrete? I understood that he wanted sent down better concrete than was specified.

21823. *Mr. Gummow.*] The bluestone pitchers were coloured on the plans of Contract 69 in just the same way as they were coloured upon the plans of previous contracts? Yes.

21824. So that contractors who had carried out previous contracts could easily see that the colouring upon the plans would apply to bluestone pitchers? Yes. Even a strange contractor could find out what was meant, because the specification would help him. While the drawings did not specifically say that one colour meant bluestone concrete and another colour meant bluestone pitchers, the specification would say where bluestone pitching and where bluestone concrete was to be put. Taking the specification in conjunction with the plans, there could be no doubt as to what was meant.

21825. There could be no doubt in anyone's mind but that the colouring in this instance meant bluestone pitching? There could be no doubt about that, because the bluestone concrete would be shown in neutral tint, which is quite a different colour from Prussian blue. I do not think any sandstone concrete was shown in the case of this contract; but, if it were shown, it would be in a light wash of Indian ink.

21826. *Mr. Parkes.*] The voucher I now hand you is dated the 7th August, 1894? Yes.

21827. How much bluestone pitching is there paid for? Six yards.

21828.

- J. Davis.  
10 Nov., 1896.
21828. The voucher I now hand you is dated 20th May, 1895? Yes.
21829. How much bluestone pitching is there paid for? Twenty-one yards.
21830. The intervening vouchers would carry the increase? Yes.
21831. That would be the quantity paid for up to the date of the change in the department? Yes.
21832. The first voucher signed by Mr. Darley had 22 yards of bluestone pitching in it, had it not? The voucher of the 30th May is signed by Mr. Smail, Mr. Darley's substitute.
21833. But the former one is not signed by him? No; the first voucher signed by Mr. Smail bears the date of 20th May, 1895.
21834. *His Honor.*] Having referred to the site plan of No 75, what do you find to be the case in reference to the matter upon which I questioned you just now? The two contracts appear to coincide. There is a piece shown on Contract No. 72 drawing to be constructed on the Ashmore-street side of the junction. The two contracts close.
21835. I find I was mistaken · it was not Mr. Nardin, but Mr. Barling, who, in his minute of 28th October, 1891, says: "And a small gap has been left between 'B' and 'D,' which, it is estimated, will cost £1,264 to complete"? I imagine the explanation of that is simply this—that at the date of the minute there remained £1,200 worth of work to be completed at the lower end of Contract No. 75, and that had to be taken into consideration in providing the funds. It was not that it was not included in the contract.
21836. *Mr. Parkes.*] What do I understand that you infer from Darcus's evidence with reference to the concrete? I understand Darcus's evidence in this way. He swore that he had seen five mixings of bluestone concrete in which he considered that a few shovelfuls of extra stone had been put into the mixture, and I further understood that when he was down in the Premier-street chamber he wanted better concrete than was being sent down. He did not say anything about the quality of the concrete on that occasion. But, when he was questioned with reference to the quality of the concrete, he said he had actually seen five mixings himself in which he considered there was more bluestone than there should have been. When he was speaking of the kind of concrete sent down, I also understood him to say that he did not see it, but that he thought that the class of work he was carrying out—that is, the putting of concrete into an arch—required better concrete than the men were sending down. He did not say anything as to the qualities not being in accordance with the specification. That was not the point.
21837. Did you not understand from his evidence that he asked for good concrete because the men were sending down inferior concrete? No; I understood him to say that he wanted better concrete put into the work that he had in hand.
21838. When the excavation of the sewer was made for the duplicate sewer in the case of Contract 69, the excavation was also made for the Premier-street chamber, was it not? Yes.
21839. The chamber and shaft? Not the shaft. The shaft was not included, as far as excavation was concerned, under Contract 69.
21840. When you wrote your minute, which appears upon page 133 of the Parliamentary return, in which you say that the size of the shaft in Premier-street, excavated under Contract 62, was 12 ft. x 5 ft., you referred to an excavation which was not carried out under Carter, Gummow, & Co.'s contract at all? No; the excavation was done under McSweeney's contract, No. 62.
21841. It was then excavated to the full size of 12 ft. x 5 ft.? Yes, under Contract 62, but it was originally intended, under Contract 69, to increase the shaft from 12 ft. x 5 ft. to 18 ft. x 8 ft. That was the original intention, and that is what you will find in the specification. Then, as has been explained, the size of the shaft was reduced to 14 ft. x 7 ft.
21842. To the size shown in the present drawing? It is in the second drawing. The first drawing was cancelled. The third drawing issued to the contractors provided for the shaft as it stood only. There was no excavation whatever to be done under Contract 69. In other words, the 12 ft. x 5 ft. excavation was done under Contract 62, and the lining of the shaft, 12 ft. x 5 ft., was done under Contract 69.
21843. That was done in accordance with the latest plan given? Yes.
21844. *His Honor.*] And there you say there would be no filling at all? No, there would be no filling.
21845. *Mr. Norrie.*] Will you turn to Darcus's evidence, at Question 2149, as to the quality of the concrete? Yes; that referred to the material which Darcus asked might be given to him when he was putting in the shaft-chamber at Premier-street. The question and answer read thus:—  
"Was the material bad? I did not consider that it was good enough, and I applied for better."
21846. Will you now read what Darcus says in reply to Question 2143? Yes. He was asked by Mr. Parkes what was his occupation, and he said he was a carpenter. It will be seen that it was a little out of his province to ask for better material in connection with the concreting.

John Carter recalled and further examined:—

- J. Carter.  
10 Nov., 1896.
21847. *His Honor.*] Can you throw any light upon the question of the drawings of Contract 69 in relation to the pitchers? I know that we received supplementary drawings from time to time showing bluestone pitchers, and that we carried them out according to those drawings.
21848. You did carry out, in point of fact, more than Mr. Hickson intended that you should carry out, as it would appear? Yes, certainly; but it was not our province to send the drawings back and to ask the office to cut out the bluestone pitchers. They sent us out drawings from time to time extending over a period of some months, and upon those drawings the pitchers were shown, and we put them in accordingly.
21849. There is one matter about which I wish to ask you a question, Mr. Carter, and it is one in which, exercising my discretion, I do not wish to be made public. I do not think that it is right that it should be made public. I will, therefore, request the press—if they do not see any reason to decline to do so, for I will not make any order—to leave. The reporters would themselves recognise, if they knew the nature of the question I intend to put, that it would be very unfair that it should go forth.  
[The reporters withdrew.]
- A witness, Mr. Carter, mentioned some gentleman who had been in a very good position whom you and other persons at North Shore had assisted in practically supporting, or, at any rate, whom you had helped to support. I am not going to ask you the name of the gentleman, even now. If you would rather put the name down on paper than give it orally I will allow you to do so? I can think of only one gentleman to whom your Honor can be referring, and I should prefer to put the name down upon paper.
- 21850.

21850. There was no one else excepting the gentleman whose name you have handed to me to whom the statement to which I have referred could apply? No; I think the name I handed to your Honor must be that of the gentleman referred to. J. Carter.  
10 Nov., 1896.

*Mr. Parkes: Would there be any objection, your Honor, to my knowing the name?*

*His Honor: I would have let you know the name, Mr. Parkes, if it had been in the least degree material; but it is utterly immaterial, and it is therefore fair, I think, that I should not disclose the name.*

21851. *His Honor.*] I desire to know from you, Mr. Carter, whether you were acquainted with Mr. Edward Moriarty? Only to a very slight extent.

21852. He was living at North Shore, was he not? Yes; but my acquaintance with him was of the very slightest—in fact, I really could not claim any acquaintance with him at all.

21853. When did he leave North Shore? Some considerable time ago. In the interval between my boyhood and the time of Mr. Moriarty's leaving I was away in the country surveying, so that I saw nothing of him.

21854. He was not living at North Shore at the time you were carrying on any work for the Government? No.

21855. You did carry on some work during his connection with the department, did you not? I do not think so. I think Mr. Moriarty relinquished his position in January, 1889, and I had only just appeared on the scene as a contractor then. It is barely seven years since I returned to Sydney from Tasmania.

21856. Did you ever, directly or indirectly, have any money or business dealings with Mr. Moriarty? None whatever.

21857. You are perfectly certain of that? Yes.

21858. You never directly or indirectly assisted Mr. Moriarty in any way? No.

21859. You are quite sure of that? Quite sure of it.

21860. Do you know whether Mr. Snodgrass, Mr. Forrest, or any one of your partners, was an acquaintance of Mr. Moriarty? No; I think that would be quite out of the question. I do not think they knew him ever so slightly.



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# PUBLIC WORKS INQUIRY COMMISSION.

## APPENDICES.

### Appendix No. 1.

“B.”

#### SPECIFICATION.

##### 1. *Description of Contract.*

This contract comprises the provision by the contractor of all labour, machinery, tools, plant, and everything that may be necessary for the construction of the Northern Main Sewer, Leichhardt and Annandale Section, as described in detail in the specification, schedule to specification, special condition, and general conditions, and as shown on the following drawings:—

- No. 1. General plan showing sites of sewers, &c.
- No. 2. Longitudinal sections of main and branch sewers.
- No. 3. Cross-sections of road deviations, &c.
- No. 4. General elevation of Johnstone's Creek aqueduct, road crossings, and details.
- No. 5. Details of Nelson-street crossing, general cross-sections of sewer, &c.
- No. 6. General elevation of White's Creek aqueduct, road crossings, &c.
- No. 7. Details of White's Creek aqueduct.
- No. 8. General details of White's Creek and Johnstone's Creek aqueducts.
- No. 9. Designs and details of shafts.
- No. 10. Details of Johnstone's Creek and White's Creek aqueducts.

##### 2. *Materials.*

The materials are to be of the quality specified in clauses 7 to 39 of the schedule to specification.

The bricks to be used in these works to be of the quality and description specified in clauses 11 and 12 of the schedule to specification, excepting all red bricks to be used in piers, arches, haunches, spandrels, parapets, and in approaches to aqueducts, up to the level of underside of coping, which are to be as specified, but to be dry-pressed bricks of approved manufacture, dimensions, form, and colour, as per sample to be seen at the Engineer's office. The dry-pressed red bricks, when immersed in water twenty-four hours, not to increase in weight more than 7.85 per cent., and the average breaking strain of twelve bricks to be taken from each parcel not to be less than 5,553 lb. All brickwork is tinted red on plans and sections; the areas on elevations of aqueducts as arches, abutments, piers, spandrels, circular panels over piers, parapets, pilasters, corbels, &c., which are to be specially faced with red and white bricks, are tinted red and white accordingly. The white bricks round circular panels to be specially formed and radiated bricks. All white bricks to be double-pressed plastic bricks, and as hereinbefore specified.

The sandstone to be used in these works to be of the quality specified in clause 15 of the schedule to specification, but the stone to be used in stop-blocks at ends of aqueducts, in copings, string-courses, and skewbacks of the aqueducts herein described to be Pyrmont bottom block sandstone, and as specified.

##### 3. *Excavation.*

The excavation for all the works comprised in this contract to be executed in accordance with clauses 40 to 80, 83 to 87, and 107 of the schedule to specification.

The excavation for the foundations of piers, abutments, abutment piers, and approaches to aqueducts to be executed as specified in the schedule to specification, and to the various depths, widths, steps, &c., as shown on drawings, or to such lesser or greater depths and widths as may be directed, said excavations to be measured to the outside of timbering where such has been approved of.

All logs, existing pitching, masonry, brick, or concrete work, oval or circular drains, sewers, &c., met with in excavations shall, in the first instance, be put aside beyond actual site of works in separate spoil-banks, to be measured and paid for at schedule prices under items of excavation of open trenches, tunnels, shafts, &c.

In connection with clause 63 of the schedule to specification, it is to be understood that the Engineer may, according to the nature of the ground, allow a margin of lining round sewer not exceeding 3 inches, consisting of concrete below level of springing and of sand-packing above level of springing. The filling round brick or concrete shafts to be executed as specified in clause 90 of the schedule to specification.

In connection with clauses 72 and 73 of the schedule to specification, it is to be distinctly understood that all sumps which the contractor may think necessary to sink on lines of sewers shall be sunk only of approved dimensions, and the cost of sinking, timbering, unwatering, removing the excavated materials, timbering, &c., and the filling in, to be defrayed entirely by the contractor.

Shafts are to be sunk as specified in clauses 65, 66, 68 to 71, and 76 to the schedule to specification, and as shown on drawing; but if during the progress of the works the Engineer may deem it necessary to omit any of the shafts shown the contractor shall omit such shaft or shafts where ordered, and such omission shall not entitle him to any claim for loss, damage, or compensation; he shall be only entitled to be paid for the shafts ordered to be sunk at schedule rates.

The price of 1 cubic yard of excavation for all work comprised in this contract (excepting refilling and disposing of surplus materials) shall include the cost of all work herein specified and described in the various clauses of the schedule to specification herein enumerated.

##### 4. *Subducts.*

Subducts to be constructed on lines of tunnels and open trenches, where ordered, as specified in clauses 78 and 79 of the schedule to specification.

##### 5. *Filling.*

The filling in of all excavations, and in any situation comprised in this contract, including the filling in round shafts, concrete foundations of piers, abutment piers, approaches to aqueducts, retaining-walls, and sand-packing over and round closing arch of sewers, &c., to be executed as shown, and as specified in clauses 85 to 97, and 101 to 107 of the schedule to specification.

The price of 1 cubic yard of filling in any situation comprised in this contract (except disposing of surplus materials) shall include the cost of all work herein specified and described in the various clauses of the schedule to specification herein enumerated.

##### 6. *Temporary and Permanent Shoring, Timbering, Piling, &c.*

The shoring and timbering, including all iron used in fixing same, required in the construction of these works to be provided, erected, placed in position, withdrawn, covered up, and measured up as specified in clauses 87, 125, and 126 of the schedule to specification.

If



If during the progress of the contract, in the opinion of the Engineer, pile foundations under piers of aqueducts is considered necessary, it shall be executed as shown on drawing, and as specified in clauses 110 to 126 of schedule to specification.

The piles to be not less than 15 inches diameter at the small end, and 17.50 inches diameter at large end, and they are to be driven until a 20-cwt. ram falling 10 feet does not drive them more than  $\frac{1}{4}$  inch at the last stroke.

#### 7. Ordnance Fences.

Road embankments to be protected by sawn hardwood ordnance fences to the extent and as shown on drawings, and as specified in clauses 197, 210, and 211, of the schedule to specification. The fences required for this contract to be two-rail only, and all posts to be 6 in. x 4 in. x 6 ft. long, the lower 2 feet to be walled into upper portion of concrete retaining-walls. All woodwork, ironwork, &c., to be painted and tarred as specified in clauses 269, 270, and 273 of the schedule to specification.

#### 8. Roadmaking.

The different road deviations and roads under, over, and at sides of main sewer, within the resumed land or otherwise, along Crescent-lane, Nelson-street, Young-street, lanes on each side of same, along White's Creek and White-street, to be constructed on embankments, in excavations, and along surface of ground, to be formed, sloped, bored out, ballasted, metalled, &c., as shown on drawings, as may be directed and as specified in clauses 200 to 204 in the schedule to specification.

#### 9. Tarred Metal Deck.

All sand filling over sewer in aqueduct to be covered with tarred metal deck, as specified in clauses 205 to 208 of the schedule to specification. The metal to be used in decking for this contract to be of  $1\frac{1}{2}$ -inch gauge, as specified in clause 140 of the schedule to specification. The tarred metal to be spread 3 inches thick over the sand-filling.

#### 10. Sewers, Storm-water Channels, &c.

The various works comprising this contract are to be executed in conformity with clauses 132 to 139 of the schedule to specification.

The Leichhardt and Annandale section of the Northern Main Sewer commences at 6 miles 51.2515 chains; to be built in open cutting of 4 ft. 6 in. x 3 ft. 6 in. internal dimensions, of concrete, extending for about 9 feet under Crescent-lane; it is then to cross the Johnstone Creek Valley, built of concrete, brick, and stone, on piers, and ten flat brick arches of 12-foot span for the length of about 159.6 feet; on pile foundations, where ordered, and on piers and twelve elliptical brick arches of 48-foot span for a length of about 633.316 feet; on abutment piers and one flat arch of 57-foot span, over Nelson-street, for a length of about 76.333 feet, and on rock foundation with one flat arch of 12-foot span, of concrete, brick, and stone facings, for a length of about 88 feet up to 6 miles 65.8478 chains. A water-escape drain, consisting of 24-inch diameter stoneware pipe, about 130 feet in length, with gullies complete, and open rock cutting about 10 feet in length, from Nelson-street towards Johnstone's Creek, to be constructed as shown.

From 6 miles 65.8478 chains to 6 miles 67.30 chains the sewer to be built in open cutting of concrete; from 6 miles 67.30 chains to 6 miles 78.24 chains of brick and concrete in tunnel in rock; and from 6 miles 78.24 chains of 4 ft. 3 in. x 3 ft. 3 in. internal dimensions of brick and concrete in tunnel in rock up to 7 miles 5.1941 chains; and then of concrete only in open cutting up to 7 miles 6.9091 chains.

The sewer then to cross the White Creek Valley, built of concrete, brick, and stone, on rock foundation and on piers, and seventeen flat brick arches of 12-foot span for a length of about 359.1 feet; on piers and nine elliptical arches of 48-foot span for a length of about 474.09 feet; on abutment piers and one flat arch of 33-foot span over White-street for a length of about 58 feet, on which length the sewer to be provided with two storm-water escape weirs and 12-inch diameter stoneware vertical off-let pipes, discharging into a water-escape drain consisting of 24-inch diameter stoneware pipes about 200 feet in length, with gullies complete; and open cutting only, about 10 feet in length, from White-street towards White's Creek, to be constructed as shown. The sewer then to be constructed on rock foundations and on piers and four flat brick arches of 12-foot span for a length of 241.79 feet up to 7 miles 23.0758 chains.

Then from 7 miles 23.0758 chains to 7 miles 23.9840 chains the sewer to be constructed of concrete only in open cutting, and from 7 miles 23.9840 chains to 7 miles 30.4840 chains the sewer to be constructed of brick and concrete in tunnel in rock, but the lining of this length of tunnel shall not be commenced until specially ordered.

A branch sewer in tunnel in rock of 3 ft. 3 in. x 2 ft. 2 in. internal dimensions to be constructed along Johnstone-street from Piper-street to Rose-street.

If during the progress of the contract the Engineer may deem it necessary to omit or alter any of the sewers, shafts, junctions, drops, inlets, or other works shown or described in the clauses herein quoted, then the contractor shall be bound to omit altogether, or alter, as may be ordered at the time, any sewers, shafts, junctions, drops, inlets, &c., as the case may be, and such omission or alteration shall not entitle him to any claim for loss, damage, or compensation. He shall be only entitled to be paid for the work actually ordered and carried out at the various schedule rates referring to such work.

#### 11. Concrete work.

The concrete to be used in foundations of all piers, and in all piers and abutment piers, for the 12-foot, 33-foot, 48-foot, and 57-foot span arches up to level of springing and top of plinths, in haunches and spandrels, between and over all arches between external brick facings up to level of underside of string-course (6 inches below invert of sewer), in retaining walls along road deviations and roads, round storm-water discharge pipes, round stoneware pipe where directed, and where ordered in any situation in the construction of these works, to be sandstone concrete of the quality specified in clause 142 of the schedule to specification.

The concrete to be used in inner sewer lining (between brick facings) of aqueducts to be special bluestone concrete of the quality specified in clause 141 of the schedule to specification, except that in this instance the bluestone metal to be broken to a size to pass freely with its largest dimensions through a ring of  $\frac{3}{4}$  inch in diameter, to be screened and washed as specified in clause 140 of the schedule to specification.

The concrete to be used in lining sewers in tunnels, open cuttings, in ventilating shafts, drops, weir-chambers, inlets, flushing, gas-check, and other chambers, and where ordered in the construction of these works, to be bluestone concrete of the quality specified in clause 140 of the schedule to specification. The whole of the concrete work comprised in this contract to be commenced, executed, and completed (including the iron bond-rods in concrete lining of sewer on lines of aqueducts, as described in clause 164 of the schedule to specification), as shown on drawings, and as specified in the schedule to specification in clauses 140 to 171.

#### 12. Cement facing.

All exposed, internal, and external concrete surfaces to be protected by cement facing prepared of cement and sand in the proportion of one cement to two of sand, except all internal concrete surfaces of sewer over aqueducts, which are to be protected by special cement facing prepared in the proportion of one cement to one of sand. The cement facing to be executed as specified in clauses 180 and 181 of the schedule to specification, complete with all battered faces, recesses, chamfers, weatherings, &c., as shown, and as shall be directed.

#### 13. Brickwork.

The brickwork comprised in this contract to be executed and completed as shown on drawings, and as specified in clauses 172 to 179 of the schedule to specification and clause 2, except that in this instance the 12-foot span arches in aqueducts are not to be built in  $4\frac{1}{2}$ -inch rings, but they are to be built in radiating through courses of rubbed and gauged or radiated bricks, as shown, and as shall be directed. The 48-foot span arches to be built as specified, and to be thickened out at the haunches, so as to abut against the sandstone concrete filling over piers between the arches, and between the external brick facings as shown.

#### 14. Masonry.

All freestone ashlar in skewbacks, string-courses, copings, 6 ft. 8 in. x 2 ft. x 9 in. stop-blocks at ends of aqueducts, and steps, to be provided, dressed, set in cement and built in where shown on drawings and where directed, as specified in clauses 15, 182, and 183 of the schedule to specification, and in clause 2. The exposed faces of skewbacks to be finished with 2-inch parallel drafted margins along each exposed arris, stopped in at inner edges, and the surface of stones between to be picked down, the projecting parts to be level with true line of wall.

15. *Squared bluestone pitching.*

Squared bluestone pitching to be provided and set round manhole covers, and where ordered, to be 7½ inches deep, and as specified in clause 186 of the schedule to specification.

16. *Squared freestone pitching and channelling.*

Squared freestone pitching to be set round gully gratings, and in road-channels as shown, and where ordered, as specified in clause 187 of the schedule to specification.

17. *Freestone curbing and gully covers.*

Freestone curbing to be set along edges of footpaths, at gully-gratings, &c., to be of the exact dimensions, dressed and sunk as shown, and as specified in clause 188 of the schedule to specification. Gully-covers, 3 ft. 3 in. x 3 ft. x 9 in., to be provided and set, dressed to the exact dimensions, where shown, as specified in clause 183 of the schedule to specification.

18. *Pipe-laying and Jointing.*

The providing, laying, and jointing of glazed stoneware pipes to be executed as specified in clauses 13, 14, 137, 170, 189 to 194 of the schedule to specification.

19. *Scupper-pipes, slate covers, &c.*

The 4-inch diameter glazed stoneware scupper-pipes along footpaths over sewer on lines of aqueducts to have cistern heads built of concrete, covered on top with 16 in. x 9 in. x 1 in. slate covers set in cement as shown.

20. *Cast-iron and Wrought-iron work.*

All cast-iron ventilating grates and closed manhole covers with frames, gas-check frames, gully-gratings and frames, galvanised wrought-iron step-irons, &c., required for this contract to be supplied by the Government to the contractor, and to be received and removed by him when not required as provided in clauses 264 and 265 of the schedule to specification. Contractor to place said ironwork in position, wall in, joint, and fix same in the works, as specified in clauses 138, 139, 163, and 170 of the schedule to specification, as shown on drawings, and as shall be directed.

21. *Order of works.*

The excavation of all shafts to be commenced simultaneously within three weeks after the date the contract has been signed, and all shafts to be completed within nine weeks after commencement of excavation. The five working shafts shown on lines of tunnels provide seven working faces. The driving of the tunnels to be commenced from all faces simultaneously, and the average total progress at all working faces during every day of twenty-four hours to be not less than 11'666 feet or 70 feet during every week of six working days of tunnel excavation complete.

The various excavations of open trenches for sewers, piers, and abutment piers of aqueducts, approaches to same, roads, &c., to be commenced in each length from the different faces simultaneously. The piling, where such has been ordered for foundations of piers of aqueducts, all pipe-laying, concrete work, brickwork, masonry, &c., required in shafts, chambers, junctions, tunnels, foundations of piers, and abutment piers of aqueducts to level of top of plinths and springing of arches, and in sewers in open cuttings approaching aqueducts, &c., to form the first part of the works.

The construction and completion of all brickwork, concrete work, and masonry of all piers, abutment piers, with all arches, of 12-foot, 33-foot, 48-foot, and 57-foot span and spandrels up to level of tops of said arches, to form the second part of the works.

The construction and completion of all concrete work, brickwork, masonry, &c., of all sewers over aqueducts from top of arches to level of top of all parapets, including weir chambers, storm-water discharge pipes, sand filling, and asphalt covering over aqueducts; road-making, road-repairing, and every other work required in the completion of the whole contract, to form the third part of the work.

In constructing the various items forming the first and second part of the works, it is to be distinctly understood that all piers and abutment piers for arches of 12-foot, 33-foot, 48-foot, and 57-foot span must be built and completed up to level of springing and top of skewbacks, as the case may be, throughout each respective length of aqueduct over each valley, before any of the arches are commenced.

On completion and approval of all piers and abutment piers, each series of arches over each valley to be commenced (unless otherwise directed) at its eastern end, and to advance to its western end, with not less than six centres at a time for the arches of 48-foot span, and with five centres for the arches of 12-foot span, that is to say—

After the first six centres of 48-foot span and the first five centres of the 12-foot span arches are placed in position, the arches over same are to be built and completed one after another, then the spandrels between the 48-foot span arches are to be built with concrete between brick-facings to a height of 11 ft. 3 in. above the springing, after which the centres from underneath the first arch of each series, after the specified period allowed for settlement has expired, to be removed and at once to be re-erected over the sixth or seventh openings, as the case may be, then the centres from the second arch to be removed and re-erected over the seventh and eighth openings, and so on, and the same system to be continued until all arches of one aqueduct have been built and completed.

All centres of arches, cambered as shall be directed, to be strong enough in every part to carry the weight of each arch to be built thereon. Centres under the 12-foot span arches shall not be removed until fourteen days after the completion of each arch. Centres under the 48-foot span arches shall not be removed until twenty-eight days after completion of each arch, and the concrete and brickwork of spandrels between the arches from springing of arch to a height of 11 ft. 3 in. above same, and the centres of the 33-foot span and the 57-foot span arches shall not be removed until fourteen days after the completion of each arch, and until the centres of the adjoining arches at each side of each respective arch have been removed.

After all arches of one aqueduct have been completed as specified, and approved of, the concrete, brickwork, and masonry, as the case may be, to be built in between and above same, in horizontal layers transversely and parallel with gradient of sewer longitudinally, so that all arches of one aqueduct (except where otherwise directed) shall be gradually, uniformly, and equally weighted, as the superstructure rises to the levels hereinbefore specified.

22. *Schedule to specification, special condition, and conditions of contract.*

Notwithstanding that certain clauses of the schedule to specification are especially enumerated, it is to be understood that the schedule to specification, special condition, and the general conditions attached to the specification, shall be held binding in all matters relating to this contract, as far as the Engineer may deem the same applicable.

23. *Note.*

Parties tendering are particularly requested to observe that they must name only one rate of percentage above or below all the prices in schedule, and not one rate of percentage upon certain items, and another rate or rates upon others.

This is the specification marked "B", referred to in our annexed agreement with Her Majesty the Queen, dated the 16th day of May, A.D., 1895,—

Witness—HAROLD F. NORRIE.

JOHN CARTER.  
FRANK MOOREHOUSE GUMMOW.  
By his Attorney,—JOHN CARTER.  
D. G. SNODGRASS.

This is the specification marked "B," referred to in my annexed bond to Her Majesty the Queen, dated the 16th day of May, A.D., 1895.

Witness—H. F. NORRIE.

JAMES GILLAN.

This is the specification marked "B," referred to in my annexed bond to Her Majesty the Queen, dated the 16th day of May, A.D., 1895.

Witness—H. F. NORRIE.

GEO. FORREST.

"C."

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## SCHEDULE TO SPECIFICATION.

*Land required for works.*

- Access to works. 1. Access to the site of the works (other than by public roads) to be had by means of such land the Engineer may deem necessary.
- Surface area for shafts. 2. For the purpose of sinking, working, and building shafts on lines of streets, and on private ground, the contractor to have temporary possession of an area of 24 ft. by 17 ft. at the site of each shaft, unless otherwise directed.
- Surface area for open trench. 3. For the purpose of excavating open trenches, and for constructing the various works therein, and raising embankments over same, or where ordered, contractor to have temporary possession of such land, of the exact widths and lengths which, in the opinion of the Engineer, is required for these works.
- Application for land. 4. The land herein referred to, to be set out by the Engineer upon receiving written application from the contractor. Such application must be made four weeks prior to the time the said land is required.

*Setting-out work.*

5. The centre lines of sewers, &c., are shown on general plans by full lines, which will be marked on the surface of the ground, the same as on plans, as the works proceed.
6. Contractor shall at his own cost and expense at any time—by day or by night, either on working days or on Sundays or holidays—render all such assistance and supply all such labour, plant, and lighting as the Engineer or Superintending Officer may require, to set out, to check such setting out, or to inspect any portion of the works, which must for that purpose be left clear and free from any obstruction or impediment. During and for the performance of those operations, contractors shall be obliged to suspend any or all of his work, if required to do so by the Superintending Officer, and without having any claim for loss or damage on account of such temporary suspension.

*Materials.*

- Samples. 7. All materials supplied by the contractor are to be of the best quality and description of their respective kinds. Samples of each kind to be submitted for the approval of the Engineer, and retained in office; and, on approval having been obtained, they are to be delivered on the works ready for use, as per sample.

- Source of supply and manufacture. 8. The contractor shall inform the Engineer of the sources whence the various materials are supplied, or of the places of their manufacture, and afford him every facility to inspect their supply or manufacture at any stage of the same.

- Notice of delivery. 9. Due notice shall be given by contractor to the Superintending Officer when any material is brought on the ground, all of which must be neatly stacked in regular heaps, submitted for approval, and approved of in writing by the Superintending Officer, before it may be used in the works. None but that so approved shall be used.

- Gauging and weighing. Bricks. 10. The contractor to provide approved gauge-boxes or scales for measuring or weighing all materials supplied.

11. Bricks to be double-pressed, of well-mixed material of approved quality and uniform fineness; to be new, sound, hard, and well-burnt kiln bricks, free from cracks and all other defects, equal in every respect to the sample brick to be seen at the Engineer's office. They are to have sharp arrises, and to be of approved dimensions, form, and colour, and, when ordered, to be specially moulded. Radiating and specially-formed bricks to be provided for all segmental shafts. All bricks to be subjected to the following tests:—

- Tests. (a) *Tensile strength.*—The tensile strength to be tested, in the departmental testing machine, by laying the brick horizontally on its base of 3 inches, between supports 7 inches apart, and the strain applied across the centre of the brick. An average breaking strain of twelve bricks to be taken, which must not be less than 8,000 lb.

- (b) *Porosity.*—Bricks immersed in water for twenty-four hours must not increase in weight more than 3 per cent. Should the twelve bricks fracture under the foregoing average strain, or prove more porous than 3 per cent., then the Engineer may reject the whole stack of bricks from which the twelve bricks were taken.

- Defective bricks. 12. In the event of the contractor delivering bricks of a mixed description and quality, the Superintending Officer shall have the power to require of the contractor to have those bricks which, in his opinion, are suitable for the works, picked out and stacked where directed, and those unsuitable removed from the site of the contract; and in the event of the contractor refusing or failing to comply with such request within twelve hours from the time it has been made, then in all such cases the Superintending Officer shall have the power of rejecting the whole of the bricks so delivered by the contractor.

- Stoneware pipes. 13. Stoneware pipes to be of well-ground and mixed material, of tough, tenacious, impervious quality, well-burnt, sound, hard, uniform in thickness, true in section, straight longitudinally, uniformly glazed both inside and outside, free from fire and other cracks, flaws, and ash-holes, the collar perfectly joined to the barrel, and in every way equal to sample pipe to be seen at the Engineer's office.

- Dimensions. Pipes to be of the following thicknesses and depth of collars, namely:—

| Pipes, inside diameter, | 9 inches; | thickness, | $\frac{1}{10}$ inch; | depth of collar, | 2 inches.         |
|-------------------------|-----------|------------|----------------------|------------------|-------------------|
| " "                     | 12 "      | " "        | $\frac{1}{8}$ "      | " "              | 2 "               |
| " "                     | 15 "      | " "        | $\frac{1}{4}$ "      | " "              | 2 $\frac{1}{4}$ " |
| " "                     | 16 "      | " "        | $\frac{1}{4}$ "      | " "              | 2 $\frac{1}{4}$ " |
| " "                     | 18 "      | " "        | $\frac{1}{2}$ "      | " "              | 2 $\frac{3}{4}$ " |
| " "                     | 21 "      | " "        | $\frac{1}{2}$ "      | " "              | 2 $\frac{5}{8}$ " |
| " "                     | 24 "      | " "        | $\frac{1}{2}$ "      | " "              | 2 $\frac{3}{4}$ " |

- Tests. All parcels of pipes used in these works will be tested and submitted to the following crushing strains, as applied in the departmental testing machine:—

24-inch diameter pipe, 165 lb. per square inch of bearing surface.

|      |     |       |     |     |
|------|-----|-------|-----|-----|
| 21 " | " " | 165 " | " " | " " |
| 18 " | " " | 142 " | " " | " " |
| 16 " | " " | 142 " | " " | " " |
| 12 " | " " | 142 " | " " | " " |
| 9 "  | " " | 142 " | " " | " " |

If the Engineer deems it necessary, the pipes will also be tested for porosity. Should the pipes fracture under the foregoing strains, or not prove impervious to water, then the Engineer may reject the whole parcel from which the pipes were taken.

- Defective pipes, &c. 14. In the event of the contractor delivering quantities of pipes, bends, and junctions of a mixed description and quality, the Superintending Officer shall have the power to require of the contractor to pick out and stack, where directed, those pipes, bends, and junctions which, in his opinion, are suitable for the works, and those unsuitable removed from the site of the contract; and in the event of the contractor refusing or failing to comply with such request within twelve hours from the time it has been made, then in all such cases the Superintending Officer shall have the power of rejecting the whole of the pipes, bends, and junctions so delivered by the contractor.

- Sandstone. 15. All sandstone used in the construction of these works to be hard, sound, and solid, of the best description, free from all defects, and as per sample to be seen in the Engineer's office, and to stand a crushing strain of 6,500 lb. per square inch. A tensile test will also be required; for this six stones must be prepared, 4 in. by 4 in. by 12 in.; these when laid on their natural beds upon supports 10 inches apart, must give an average breaking strain of not less than 4,333 lb., the strain being applied across the centre of the stone.

- Bluestone. 16. All bluestone used in the construction of these works to be of the best description of basaltic bluestone obtainable, free from honeycomb and all defects, and as per sample to be seen at Engineer's office.

- Sand. 17. Sand to be sharp quartz sand, free from all earthy, loamy, or clayey matter, equal in quality to the sample of Nepean River sand to be seen at the Engineer's office, and to be washed perfectly clean whenever the Engineer deems it necessary.

- Cement. Condition. 18. The cement to be used throughout these works to be well packed in strongly-made casks; to be the best Portland cement, of approved brands and manufacture, delivered in thoroughly sound condition, fit for immediate use, and without requiring seasoning or air-slacking; to be free from any symptoms of staleness, caking, damage to the packing, hard or set lumps; and no barrel or portion of same to be used until it has been examined and approved. The Engineer may

may delay approval of any parcel of cement pending tests extending over a longer period than hereinafter specified. Samples taken from various casks, from each parcel brought on the works, to be submitted for testing. Such samples shall be taken out of the package in an equal section, extending from the surface to the centre of the cask. The cement, when gauged with water to a stiff paste, must set in a damp atmosphere in from one and a half to six and a half hours. Neat cement, of the consistency abovementioned, will be made into pats, kept in moist air until set, and then placed in water at a temperature of between 65° and 80° F., and also in Deval's hot bath, at a temperature of 180° F. These test pats will be examined from day to day, and should they show systems of blowing, or any alteration or variation in form or volume, or imperfect setting capacity, the whole parcel from which the cement was taken will be rejected. The cement shall weigh not less than 100 lb. per imperial struck bushel, filled from the hopper. Each cask shall contain not less than 374 lb., exclusive of weight of packing. The specific gravity to be not less than 3.00; but cement up to or exceeding the specified degree of fineness, if of a lighter weight than herein stipulated, but otherwise equal to the specified tests, may be accepted subject to the decision of the Engineer, provided that the deficiency in weight is made up in quantity. The cement must be ground so fine that the residue on a sieve of 6,400 meshes per square inch, without rubbing, shall not exceed 20 per cent., and on a sieve of 14,500 meshes not more than 30 per cent. For the test for tensile strength, the cement will be gauged with three times its weight of standard sand (viz., sand from crushed sandstone, washed, dried, and sifted through a sieve of 400 and retained upon one of 900 meshes to the square inch), and mixed with an average of about 10 per cent. of their weight of water, and made into briquettes formed in moulds of 1 inch sectional area at the weakest part. Such briquettes to be kept in a damp atmosphere, and put into water twenty-four hours after they have been made, and remain in water at a temperature of between 60° and 70° F., until their tensile strength is tested. These briquettes must bear a tensile stress of not less than 100 lb. per square inch after seven days, and 200 lb. per square inch after twenty-eight days from being moulded. Cement, when tested neat, must bear a tensile stress of at least 300 lb. to the square inch after three days, two of them in water; and 450 lb. after seven days, six of them in water; and 550 lb. after twenty-eight days, twenty-seven of them in water. Briquettes shall also, after being in a damp atmosphere for twenty-four hours, be kept in water at a temperature of 180° F. for six days, when the tensile stress must be equal to that specified for twenty-eight days at normal temperature. The tensile strength will be ascertained in the Government testing-machine, with the load increasing at the rate of 200 lb. per minute, and the average breaking weight of six briquettes will be taken for each test. Any cement which absorbs in proportion more than 2 milligrams of carbonic acid to 3 grains of cement shall be taken as containing more than the permissible quantity of free lime or magnesia. Should the sample fail in any or all of these tests, or show irregularity in quality, or not show a proper progressive increase in strength with age of briquette, then the Engineer may reject the whole parcel from which the sample was taken, and the contractor shall at once remove the said parcel of cement from the site of the works at his own expense; failing which, the Engineer may have it removed at the contractor's cost without further notice. Empty casks to be immediately broken up and removed from off the works. To facilitate the gauging of cement throughout the contract, cement casks will be taken as equal to holding 4 cubic feet; otherwise, the contractor to provide and make approved gauge-boxes, holding exactly 4 cubic feet, for measuring cement.

Cement is to be brought on the ground in quantities of not less than fifty casks, provided that this quantity is sufficient for fourteen days' supply, but in no case is less than fourteen days' supply (whatever that may prove to be) to be brought on the ground in one parcel; nor is the supply stored on works to be at any time less than fourteen days' supply. All cement to be kept on the ground in approved weather-tight sheds, under lock and key, which shall be in the custody of the Superintending Officer.

19. The mortar to be used in these works to be composed of one part of Portland cement and of two parts of clean washed sharp sand, as described in clauses 17 and 18, the proportion of each to be correctly ascertained by measurement, the whole to be mixed with fresh water, as may be directed, to be well incorporated, and to be used fresh. Any mortar which has become hard or set to be at once rejected. All mortar to be mixed on approved sawn timber platforms close to where it is required.

20. Special mortar, composed of one part of cement and one part of sand, and prepared as before described, to be provided and used in all portions of the work where specially specified or directed.

21. The grout to be made of mortar as described in clause 20, to be mixed fluid in tubs, close to where it is required, and to be used fresh.

22. Puddle to consist of the best clay to be obtained in the district within a radius of 5 miles; to be carefully turned over and mixed with fresh clean water until the clay, in the opinion of the Engineer, has become of one even and uniform colour and plasticity.

23. Spun-yarn to be of the best description of  $\frac{3}{8}$ -inch New Zealand flax.

24. Lead to be of approved quality, of the best description of soft pig lead, and to be delivered in pigs, which must show the brand or mark of the manufacturer.

25. Wrought-iron and steel to be of the very best description and quality, with square arrises, free from scales, blisters, laminations, and all other defects, and subject to tests hereinafter specified.

26. The tests for rolled iron shall be as follows:—A piece of iron of such width as shall not exceed 2 inches, or exceed 1 square inch in cross-section, and of a sufficient length to have 10 inches under actual tension, shall be cut, as directed by the Engineer, from any plate or bar about to be used on the work, and the following tensile stresses shall be applied:—

|   | Stress per square inch without fracture. | Ultimate elongation. | Ultimate contraction of area. |
|---|--|----------------------|-------------------------------|
| Rolled girders...   | 20 tons                                  | 8 per cent.          | 10 per cent.                  |
| Plates—across grain ...   | 18 "                                     | 4 "                  | 6 "                           |
| Plates—across grain ...   | 22 "                                     | 10 "                 | 12 "                          |
| T, L, and bulb T bars ...   | 22 "                                     | 10 "                 | 15 "                          |
| L bars ...  | 23 "                                     | 12 "                 | 18 "                          |
| Square, flat, and round bars, and bolts over 4 inches sectional area ...  | 23 "                                     | 12 "                 | 18 "                          |
| Square, flat, and round bars, and bolts up to 4 inches sectional area ... | 24 "                                     | 12 "                 | 25 "                          |

Iron within 10 per cent. of above specified stress will be accepted if the contraction of area and elongation are proportionately higher.

The wrought-iron to be further tested for ductility, as follows:—

A plate planed and rounded on both edges, about 4 in. wide and 1 ft. long, shall bend cold over a slab, the corner of which is rounded to  $\frac{1}{2}$  inch radius, for the following angles, without showing any sign of injury or fracture:—

|                      | With grain. | Across grain. |
|----------------------|-------------|---------------|
| 1-inch plate for ... | 15 degrees  | 5 degrees     |
| " ...                | 25 "        | 10 "          |
| " ...                | 30 "        | 12 "          |
| " ...                | 35 "        | 15 "          |
| " ...                | 52 "        | 20 "          |
| " ...                | 70 "        | 30 "          |

27. Rivet-iron must be capable of being bent cold until the sides are in close contact, without sign of fracture on the convex side.

28. The tests for rolled steel shall be as follows:—

The steel to be of a mild quality, having an ultimate tensile strength, either lengthways or crossways, of not less than 26 tons, and not more than 31 tons per square inch, on a test bar, cut in a similar manner to those for rolled iron, with a minimum elongation of 20 per cent., and a minimum contraction of area of 40 per cent.

Strips cut from any steel plate, angle, or bar, to be heated to a low cherry red, and cooled in water of 82 degrees Fahrenheit, must, when cold, stand bending double round a curve, of which the radius is not more than one and a half times the thickness of the plates tested, without showing any sign of injury or fracture.

29. Cast-iron to be equal to No. 2 pig-iron, or of a proper mixture of No. 1 and No. 3 pig-iron, according to the description of iron-work and pattern; said iron to be of the best quality, tough, close-grained, and capable of being chipped and drilled without difficulty.

|                      |   |
|----------------------|---|
| Tests                | 30. Branded test-bars, 2 in. x 1 in x 3 ft 6 in, to be cast vertically, in the presence of the Superintending Officer, from the cupola from which castings are being run, and to be then carefully marked with the date. These test bars will be placed on bearings 3 feet apart, and submitted in the centre to a weight not exceeding 28 cwt, and the deflection caused by this weight must not be less than $\frac{3}{8}$ inch before fracture; if the bars do not stand thus test to the satisfaction of the Engineer, then the whole of the castings which have been cast of iron of the same quality shall be at once rejected  |
| Tests of castings    | 31 All castings of every description, before they leave the foundry, to be carefully examined and weighed, to be slung on chains above ground, and to be sounded with a hammer, and they are again to be carefully examined, slung, and sounded with a hammer when delivery of same is taken at the site of the works   |
| Tests of pipes       | 32 All straight pipes required in the contract, before delivery of same is taken on the works, shall be, at the foundry or at the site of the works, as shall be directed, duly proved under hydrostatic pressure equal to a column of water of 200 feet, and when under pressure to be thoroughly sounded quickly all over with a hammer of not less than 4 lb.  |
| Gun metal            | 33 The gun metal required throughout these works to be an alloy composed of eight part of copper to one part of tin, unless otherwise specified   |
| Cast steel tests     | 34 The tests for cast steel shall be as follows —<br>Bars turned to $\frac{3}{8}$ inch diameter for a sufficient length to have 5 inches under actual tension, shall have an ultimate tensile strength of not less than 26 tons per square inch, and a minimum elongation of 18 per cent  |
| Cost of tests        | 35. The cost of providing the materials and wrought and cast iron works, &c, herein described, required by the Engineer for testing purposes, and the carriage of same to the Public Works testing-room, place of manufacture, site of works, or to the University, as the case may be, and as shall be directed, shall be borne solely by the contractor; and any of the materials, or any part of the wrought iron and gun metal work, or any of the pipes, casting, &c, injured or broken by the testing, shall be immediately replaced by new and sound materials at contractor's expense; wrought iron, gun-metal, cast iron pipes, or other castings, to be again tested as before described, until the whole have been tested to the entire satisfaction of the Engineer |
| Timber               | 36 Timber to be of the best description, sound, straight, free from sap, large or loose knots, wanes, shakes, gum-veins, pipes, or other defects  |
| Hardwood             | 37 Hardwood used in the works to be of approved timber<br>Round timber to be carefully barked; the diameter given on drawing is to be measured at the small ends<br>Hewn timber is to be squared true on all sides, and dressed fair and clean with the adze, so as to show no axe-marks, to be of full dimensions, free from sapwood, and no heart timber must appear on the outside<br>Sawn timber to have clean sharp arrises, to be cut die square, free from heart timber, and of the full dimensions shown or specified.  |
| Softwood             | 38 Softwood timber to be of the best Baltic or yellow deals, and of the exact dimensions specified when finished  |
| Split fencing timber | 39 Split posts and rails for fencing must be perfectly straight and cleanly split, free from large knots, splinters, and other defects  |

#### *Earth borings*

40. When earth borings have been taken the results have been shown on drawings, but the Government undertake no guarantee whatever regarding the kinds of soil that will be met with or the firmness or stratification of the ground to be excavated, or the amount of unwatering to be done, or the strength of the timbering that may be required, or the nature and extent of other precautions which may have to be adopted

#### *Clearing and Grubbing*

41 The areas of the sites for all excavations and of all embankments, together with a margin of 10 feet in width beyond all these areas, to be cleared and grubbed of all trees, scrub, stumps, roots (to the depth of same), and dead timber, and the whole of such trees, scrub, stumps, roots, and dead timber thus grubbed and cleared to be removed and cleared away from any lands set apart for the purposes of this contract. The cost of all clearing and grubbing to be covered by and included in the schedule price for excavation

#### *Excavation.*

42. No excavation to be commenced on any portion of the contract until, in the opinion of the Engineer, sufficient building materials are on the ground, together with the necessary appliances and plant to ensure the uninterrupted progress and continuance of the works, after they once have been commenced, at any locality, without any delay or stoppage

43 It is to be distinctly understood that, when sinking shafts and driving tunnels, the materials excavated, on their arrival at level of staging above mouth of shaft, are to be at once removed; and when materials, &c, are to be conveyed through shafts to the tunnel works, that all such materials, on arrival at mouth of shafts, must be at once conveyed to the works underground, as the contractor cannot be allowed to occupy a larger area than that authorised by the Engineer.

44 When excavating in open trenches, if ordered, the materials excavated and raised to the surface are to be at once removed; and when materials are being conveyed to open trenches, where they occur in public roads, they must be at once taken into the work, so as not to impede the usual traffic.

45 The road metal, ballast, pitching, wood paving, concrete, asphalt, flagging, sodding, &c, when they are met with in excavation, are to be carefully removed, put aside, and stacked where directed

Cross sections to vary

46 The cross sections of tunnel excavation are shown on drawings, but they will vary with the solidity of the ground, and as the Engineer directs

Method of excavation in trenches with out timbering

47 Wherever the solidity of the ground permits it, the excavation in trenches for concrete or brickwork to be taken out with vertical sides to level of springing of sewer arch, and to the exact widths of concrete or brickwork shown on drawings, and below that level to bottom of trench with curved or vertical sides, as shall be directed

Width of trenches where timbering is required

48 Where timbering is required, trenches 8 feet deep and under shall have vertical sides, and shall be 1 ft 3 in wider to outside of polling boards than width of concrete or brickwork. Where trenches are over 8 feet deep and require timbering, they shall have vertical sides, and shall be 1 ft 3 in wider to outside of polling boards than the width of the concrete or brickwork for the lower 8 feet. Above that level they shall be 2 feet wider to outside of polling boards than concrete or brickwork

For embankments

49 The excavation for foundation of embankments to be taken out, where ordered, 12 inches below surface of ground, and to such widths and lengths as shall be directed, or as ordered for benching

Width of trenches

50 The excavation in solid rock for pipe trenches shall have vertical sides, and be of the following sizes, viz —

|  |       |                 |
|--|-------|-----------------|
| For 24 inch diameter stoneware pipe sewers |       | 3 ft 9 in wide. |
| 21-inch                                    | ” ” ” | 3 ft 4 in ”     |
| 18 inch                                    | ” ” ” | 3 ft 0 in ”     |
| 15 inch                                    | ” ” ” | 2 ft 6 in. ”    |
| 12 inch                                    | ” ” ” | 2 ft 0 in ”     |
| 9-inch                                     | ” ” ” | 2 ft 0 in. ”    |

51 When timbering is not required in excavation in all other ground for pipe trenches, the trenches shall be of the same widths as those in solid rock. Where timbering is required, the excavation for pipe-trenches 8 feet deep and under shall have vertical sides, and shall be of the following sizes to the outside of the polling boards, viz —

|  |       |                |
|--|-------|----------------|
| 24 inch diameter stoneware pipe sewers |       | 4 ft 0 in wide |
| 21 inch                                | ” ” ” | 3 ft 7 in. ”   |
| 18 inch                                | ” ” ” | 3 ft 3 in ”    |
| 15 inch                                | ” ” ” | 2 ft 9 in ”    |
| 12 inch                                | ” ” ” | 2 ft 3 in ”    |
| 9 inch                                 | ” ” ” | 2 ft 3 in ”    |

Width of trenches

52 Where timbering is required, the excavation for pipe trenches more than 8 feet deep shall have vertical sides, and shall be the widths given in clause 61 for the lower 8 feet, and for any depth over and above 8 feet the trenches shall be of the following sizes to the outside of the 1 $\frac{1}{2}$  inch polling boards (unless otherwise ordered in writing), viz —

|  |       |                |
|--|-------|----------------|
| 24 inch diameter stoneware pipe sewers |       | 4 ft 9 in wide |
| 21 inch                                | ” ” ” | 4 ft 4 in ”    |
| 18 inch                                | ” ” ” | 4 ft 0 in ”    |
| 15 inch                                | ” ” ” | 3 ft 6 in ”    |
| 12 inch                                | ” ” ” | 3 ft 0 in ”    |
| 9 inch                                 | ” ” ” | 3 ft 0 in. ”   |

53. Transverse and other cheeks to be excavated to receive pipe-sockets and junctions, and for the purpose of making the joints. Cheeks.
54. The trenches for the cast-iron pipe-sewers to be excavated to the depths and widths which the Engineer may order. Joint-holes to be excavated to the dimensions specified or ordered by the Engineer. Cast-iron pipe trenches.
55. The excavation of trenches to be carried on in such a manner that they shall be always completed and approved for a length of 48 feet (unless otherwise directed) in advance of sewers or other works. Trenches.
56. In ground which, in the opinion of the Engineer, does not require blasting, the excavation is to be carried on by means of picking, and when the ground, in the opinion of the Engineer, is hard and suitable for blasting, charges of compressed powder, not exceeding 4 inches in length by 1½ inch in diameter, shall be used. The Engineer, however, reserves to himself the right of ordering any excavation which he may consider blasting would facilitate, to be taken out by means of charges of compressed powder not exceeding 2 inches in length by 1½ inch diameter, or he may prohibit the use of explosives altogether, when the excavation shall then be done by means of guttering and gadding. If explosives, other than compressed powder, are permitted to be used, the charges thereof will be determined by the Engineer. The use of explosives.
57. When the use of explosives is authorised, the contractor shall use every precaution and carry on such operations with such limited charges of powder only, or other approved explosives, as will loosen the shale, rock, &c., without shattering the same; and to employ approved means to prevent, effectually and thoroughly, all stones or other materials from being thrown out of trench, tunnel mouth, or shaft. Precautions.
58. Blasting will not be allowed between the hours of 10 p.m. and 6 a.m., nor after 1 p.m. on Saturdays, except by the written authority of the Engineer. Working hours.
59. Every hole drilled for blasting purposes will be measured by an inspector, and charged under his supervision. Drilling and charging holes.
60. No larger quantity of explosives shall be taken underground than is likely to be used during any current shift. Storage of explosives.
61. When pipe-sewers are to be laid in tunnels, the dimensions of tunnel to be 4 ft. x 3 ft. exclusive of timbering. Pipesewer tunnels.
62. If the contractor has exceeded the sectional area of excavation ordered, he shall remove such extra excavation, and in the case of trenches make good and fill in same at sides of trench with approved materials, and at bottom of trench with concrete described in clause 142, at his sole cost; the actual cubic contents only of the excavation and of the concrete work shown on drawings and ordered for each special length of sewer in open trench shall be paid for; and in the case of excavation in tunnels and shafts the contractor shall remove such extra excavation, and make good and fill in same with concrete or brickwork, in the manner herein specified, at his sole cost; the actual cubic contents only of the excavation and of the brick and concrete work shown on drawings, and ordered for each special length of tunnel or shaft, shall be paid for. Excessive excavation.
63. If, however, in cases where the use of explosives is ordered (and in no other case) the Engineer considers it impracticable to excavate any particular length of tunnel or shaft to the exact sectional area ordered, then he may, according to the nature of the ground, allow a margin of concrete lining not exceeding 3 inches over and above that ordered. Maximum allowance.
64. Unless otherwise directed, the excavation of the various tunnels to be commenced from the different faces described in the specification, simultaneously within the specified time after the date the contract has been signed. Starting tunnel excavation.
65. Ventilating fans or other approved means to be provided and worked by the contractor at all working shafts and tunnel faces where directed by the Engineer. Ventilation.
66. In all cases where a greater thickness of lining, or a greater cross-section area of tunnel or shaft is ordered to be executed, from whatever cause, after the length of tunnel or shaft in question has been excavated to the profile ordered in the first instance, or if any portion of the excavation of open trench is ordered to be deepened, the excess of excavation so ordered shall be paid for at schedule rates for tunnel, shaft, or open trench excavation, as the case may be, and as the Engineer shall classify and direct at the time. Enlarging shaft or tunnel.
67. No concrete or brickwork shall be commenced until the portion of sewer excavation in tunnel or open trench to be operated upon has been cleaned and levelled, and until the Engineer has examined and approved of same. Inspection and approval.
68. Shafts are to be sunk at the various sites shown on longitudinal sections and on general plans, or in lieu of those shown, at such other sites as the Engineer from time to time may determine. Wherever shafts are ordered they are to be sunk truly plumb, and of the full dimensions shown on drawings, or as may be ordered at the time, clear of timbering. Shafts.
69. All excavation for shafts situated within the lengths of open trenches is to be paid for as "excavation in open trench." Shafts in open trenches.
70. If the contractor desires, to suit his own convenience, to sink temporary shafts, they are to be sunk only at approved places, and on completion of work to be filled in, as specified in clause 95, to the satisfaction of the Engineer. The cost of sinking, timbering, unwatering, &c., and of filling in, withdrawing, or covering up timber of such shafts, to be defrayed entirely by the contractor. Temporary shafts.
- All temporary shafts to be sunk to the dimensions directed, clear of timber.
71. All shafts, temporary or permanent, to be provided and fitted during their construction and completion, or during the progress of the contract, if deemed necessary by the Engineer, with approved winding engines and steel-wire ropes capable of resisting a strain equal to six times that of the working maximum strain, or with such other winding arrangements, ladders, staging, &c., as shall be directed and approved of by the Engineer. Shaft plant.
72. Where directed, sumps are to be sunk at the bottom of shafts not less than 6 feet deep below invert of sewer, and afterwards to be filled in with concrete, as specified in clause 142. Sumps.
73. Any other sumps which the contractor, for his own convenience, may think fit to sink on line of sewer, in tunnel or in open trenches, during the construction of these works, are to be filled in with concrete, as specified in clause 142, and the cost of sinking, timbering, unwatering, and filling in with concrete, and removing the materials, &c., to be defrayed entirely by the contractor.
74. The excavation for sub-ducts in tunnel and open trench to be made below invert of sewer, or as shall be directed, with a fall towards each working shaft or face, and of such dimensions and gradients as may be determined at the time. Sub-ducts.
75. Any material obtained from the excavation, which in the opinion of the Engineer, is suitable for refilling or other works comprised in this contract, shall be put aside in separate spoil-banks beyond the site of the works. Material for "filling."
76. In the case of tunnel and shaft excavation, when "solid rock" or "more or less hard material," or "solid rock" and "more or less hard material" occur, provision is made on the longitudinal section and in the schedule of quantities for the materials to be classified under these headings. No guarantee is given as to the means which may be ordered for excavating such work. The actual excavation done in tunnels, shafts, and open trenches will, however, be paid for, not exceeding that ordered or specified. Classification of material from shafts and tunnels.
77. The schedule price for 1 cubic yard of excavation in any situation shall include the cost of taking out and placing said excavation aside in separate temporary spoil-banks beyond the actual site of work, together with the works comprised in clauses 41 and 107. Works covered by 1 cubic yard of excavation.

#### Sub-ducts.

78. Sub-ducts to be constructed, when decided on, along lines of tunnels and open trenches, commencing on each length midway, or thereabouts, between two working shafts or faces, 33 inches below invert of sewer, &c., or as shall be directed at the time, and having a fall towards each working shaft, or face of such gradients as may be determined at the time. Sub-ducts of 9 inches, or of a greater or less internal diameter, to be laid immediately underneath the timber floor of tunnel or open trench, or at sides of sewer, in hardwood boxes varying in size and dimensions as shown on drawing. Said boxes to be laid straight and true to levels decided upon, and the pipes to be laid therein, upon, and surrounded by sandstone chippings and quarry refuse. Dry sandstone packing, 4-inch gauge, to be put over pipes.
79. In solid and disintegrated rock the excavation for sub-duct to be executed as shown on cross-sections, and as shall be directed, and the sub-duct to consist of glazed stoneware spigot and faucet pipes of 9 inches internal diameter, more or less as the case may be. The pipes to be jointed dry, and the filling above same up to under size of sewer lining to be of dry stone, hand-packed, as before described. The Engineer may also, if he deems it necessary, order the pipes to be jointed altogether, or in part, with tarred gasket, 1½ inch deep, and cement mortar 1½ inch deep. The mortar to be prepared of 1 part cement to 2 parts of sand.

#### Existing Gas, Water, and Sewer Pipes, and Sewers.

80. During the excavation and construction of these works, the contractor is to take every precaution and provide and execute all, which in the opinion of the Engineer is necessary, to prevent the existing gas, water, or sewer pipes, and sewers wherever met with, or that are adjacent to these works, from injury, and to maintain the same at his sole cost, until, in the opinion of the Engineer, the refilling of excavation and the general progress of the works render further precaution unnecessary. All damage to existing water, gas, or sewer pipes, and sewers, to be repaired at once by contractor at his own cost to the satisfaction of the Engineer. Railway



*Railway and Tramway.*

81. Before proceeding to excavate underneath or near any railway or tramway, the contractor must give ample notice in writing to the District Railway or Tramway Engineer of his intention to commence operations; and he must adopt such precautions as the said Engineer may think necessary or prudent for the safety or preservation of the traffic over the said railway or tramway. The contractor will be held wholly responsible for all stoppage of traffic, delays, accidents, &c., that he or his men may cause, no matter how brought about, during the execution of the work under or near any railway or tramway.

82. The Railway Commissioners may, if they consider it advisable, place a watchman or watchmen on all work to be executed under or near any railway or tramway, for the purpose of seeing that no danger to the traffic is allowed to occur; but this shall not relieve the contractor of any of the responsibilities set forth in the foregoing clause, and the expense of such watchman or watchmen is to be borne by the contractor.

*Diverting Water.*

83. During the construction of these works the contractor shall, at his own cost, do all work which may be required for the effectual diversion of surface-water, subsoil water, and storm-water, across and beyond the site of the works, to keep the trenches free from water during the whole time the works are in progress, and in preventing any injury to the works by floods or any other causes.

*Diverting Sewage.*

84. During the construction of the works in general, and of all points of intersection of existing and new sewers, and until completion of all works connected therewith, the contractor, at his own cost, to execute all the works of every description required to prevent injury to private property or to the existing or new works by sewage, and erect and construct watertight fluming across sites of works for the purpose of conveying constantly the whole of the sewage which may flow in said sewers at any time, to the entire satisfaction of the Engineer.

*Unwatering.*

85. All water which, during the progress of the work, may drain into excavations, to be properly, effectively, and continually pumped out, and the whole to be kept dry until after the completion, setting, and hardening of all brick and concrete work and pipe sewers, at the sole cost of the contractor. The greatest care to be taken to prevent running water passing over any of the brick, concrete, and pipe-work until it has set perfectly hard; any concrete, mortar, and cement jointing exposed to wash of water must be taken up at once, and replaced by fresh concrete, mortar, and jointing, at contractor's expense.

*Temporary Bridges, Roads, Fences, &c.*

86. The contractor shall provide, erect, and maintain all necessary temporary bridges, footways, &c., over rivers, creeks, water-courses, open trenches, and underneath railways, tramways, roads, streets, and footpaths, so as to ensure that the flow of water or traffic is uninterrupted, as the case may be, during the period of contract. He shall also provide, erect, and maintain all temporary fences, hoarding-barriers, night-lights, &c., necessary to thoroughly protect both the general public, land, and property; and shall also properly ballast the temporary roads which may be required for the convenience of the public, and which the Engineer may order.

In the event of the contractor refusing or neglecting to carry out any of the above work, the Engineer shall have power (after having given twenty-four hours' notice in writing of such intention) to do the same at the contractor's expense, and the cost thereof shall be charged to the contractor on account of this contract.

*Temporary Timbering.*

87. During the excavation the contractor to adopt every precaution, and provide all materials, as planking, strutting, shoring, timbering, piling, sheet-piling; all packing materials, as straw, asphalted felt, bags, tarred gasket, puddle, &c., and carefully execute (unless where otherwise specified) all piling, sheet-piling, timbering, &c., where they are required, and carefully and securely close up and pack against the outside of all joints and open spaces between polling-boards, sheet-piles, or timbering, wherever they occur, and caulk open joints where directed, and execute whatever may be required to prevent any buildings, or other superstructures, road and other surfaces over and adjacent to the line of sewer from settling, cracking, being shaken, slipping, or falling in, and to prevent any portion of the floors, sides, roofs, and end faces of excavation, beyond the exact cross-sections and dimensions determined on, from slipping, falling, running in, or being forced through joints and open spaces in the timbering and sheet-piling, and maintain said timbering, piling, shoring, &c., where and when directed till completion of the works, to the entire satisfaction of the Engineer and at the contractor's sole cost.

*Filling.*

88. The materials referred to in clauses 75 and 93, to be used in filling in the spaces between sides of excavation, and of concrete and brickwork, over sewers, into headings, filling in abandoned open channels, low ground adjoining channels, into roads and other embankments, &c., as shown on drawings and as ordered by the Engineer. Sand only to be used in filling over sewer between copings on lines of aqueducts. All filling, unless otherwise specified, to be brought up in level layers, spread 6 inches thick, each layer to be rammed (and watered if directed) until approved of, before the succeeding layer is put on. This filling to be carried up to the surface of the ground, or to such other level or slope, &c., as may be directed at the time. Embankments to be formed as shown on longitudinal sections, to be finished in horizontal layers 9 inches thick after spreading, to be well rammed (and watered when directed) until approved of before the succeeding layer is put on, with side slopes and top widths, as shown on drawings, or as may be determined at the time; to be finished with such benches and curves as shall be directed. Only iron-shod rammers of not less than 10 lb. weight, of approved pattern, to be used, and one man to be employed in ramming to each man employed in filling.

Embankments.

Rammers.

Filling pipe trenches.

89. Material only of approved quality shall be used in refilling the spaces between sides of pipes, &c., and sides of excavation, and over pipes, &c. The refilling to be done in level layers, spread 6 inches thick (and watered when directed), each layer to be carefully and separately rammed as hereinbefore specified. The lower layers up to level of top of pipes to be carefully packed and rammed solidly under and at sides of pipes and socket-joints with spades or other narrow tools. The filling to be done as above described, to such a distance below the level of the street, road, path, &c., as the case may be, to admit of the ballasting, metal, or other covering being replaced.

90. On completion of concrete, brickwork, &c., in shafts, the space between the sides of excavation and outer face of brickwork or concrete to be filled in in 6-inch layers, well rammed (and watered where directed) with materials provided for in clauses 75 and 93, great care being taken in lowering the materials to the bottom, so that stones do not fall on top, or against sides of pipe-shafts, brick or concrete lining. Where stones are permitted to be used as filling they are to be put in in alternate layers with the earth, and at least 12 inches of earth to be placed nearest and round the pipe-shafts, brick or concrete lining.

91. Shafts not required as manholes or ventilators, on completion of contract, or when directed by the Engineer, to have all timber withdrawn (as specified in clause 95), and to be carefully filled in.

Quarry filling.

92. Where it is found necessary to carry the excavation deeper than the underside of concrete foundations, in order to obtain a compact solid bottom, the portion so excavated to be filled in to the underside of concrete foundation, or as may be directed, with good quarry filling, spread 6 inches thick, rammed and watered until approved. The price per cubic yard for providing and putting in position quarry filling is to be 1 cubic yard of "filling."

Extra material required.

93. All soil, sand, and other materials which the excavations of this contract do not supply, and which it is necessary to obtain for the completion of the embankments and filling of every description, the contractor shall procure, of approved quality, from any other source or land outside the limits of this contract. The cost of providing to be included in the price per cubic yard for "filling."

Timber left in.

94. As the works proceed, all shoring, timbering, staging, temporary bridges, piling, sheet-piling, &c., shall be withdrawn, excepting permanent timbering, as shown on drawings, and in all other cases where, in the opinion of the Engineer, the withdrawing of the same is impracticable, or would endanger the safety of the works, buildings, streets, and other surfaces over and adjacent to the works, when the contractor must obtain an order in writing, signed by the Engineer, to the effect that piling, sheet-piling, shoring, timbering, &c., may be covered up.



95. In withdrawing timbering from open trenches and shafts the same shall be commenced from bottom of excavation, or, as the Engineer may direct, from lowest practicable portion of same, and continued upwards; the contractor to exercise every precaution by means of intermediate shoring, plankings, props, &c., and the filling in around and above sewer and shaft lining to be carried on simultaneously with the withdrawing of the timbering. The cost of withdrawing to be included in the price per cubic yard for "filling." Withdrawing timbering.
96. Refilling into excavation shall be measured the net dimensions of excavation less the actual displacement of any permanent works. Any other "filling" shall be measured the actual cross-sections ordered. Measurement of "filling."
97. The schedule price for one (1) cubic yard of filling in any situation shall include the cost of removing the materials from temporary spoil-banks, or from other sources outside the limits of this contract, and the depositing same in accordance with the plans and specification, together with the work and material described in clauses 92, 93, 95, and 107. Work covered by 1 cubic yard of filling.

*Surplus Material.*

98. The excavated material not required, or approved for filling, to be removed off the works to such places as shall be ordered, spread and trimmed, and to be paid for as lead. Lead on spoil.
99. The surplus materials to be measured the actual net excavations less the actual net refilling. Measurements.
100. The distance of lead shall be measured from top of shaft or end of open cutting to centre of spoil-bank or other place of deposit. Length of lead.

*Restoration of Roads and other Surfaces.*

101. After the filling in of sewer trenches and shafts has been consolidated and approved, the surfaces of roads, streets, paths, &c., to be at once restored in the manner hereafter described, viz.: In the case of streets which are wood-blocked on concrete the City Surveyor will replace same on behalf of the contractor, at the rate per square yard stated in specification; in the case of roads or streets which are ballasted and metalled 9 inches of ballast shall be laid thereon, and after this has been blinded with selected and approved material the metal put aside, as specified in clause No. 45, shall be evenly spread and rammed until approved; in the case of roads or streets which are ballasted only 9 inches of ballast shall be laid thereon, and blinded as above; and in the case of other coverings, the surfaces to be restored to the same condition as they were before the commencement of the work. Materials damaged, injured, or otherwise not approved of as fit for reinstating surfaces to be replaced by contractor with new, sound, and approved materials of their respective kinds, together with any additional ballast which may be required, over and above that found on the site of the excavation and referred to in clause 45. If, however, in the opinion of the Engineer sufficient hard rock is excavated from the tunnels, shafts, and open cuttings, the contractor will be allowed to break such rock to a 4-inch gauge, and use same for restoring road surfaces. Wood-blocked streets.  
Ballasted and metalled streets.  
Ballasted only streets.  
Damaged materials from road surfaces.
102. Immediately the pipes are laid, or concrete and other work in connection with shafts, manholes, lampholes, &c., are executed, and the ground filled in over same in any length of sewer, it is to be distinctly understood that all surplus material is to be carted away, the road cleaned until approved, and the road and other surface to be made good, flush with surrounding surfaces of roads, paths, &c., to the satisfaction of the Municipal authorities and the Engineer, in accordance with the specification; and if the contractor fails to do this the Engineer shall be at liberty, without further notice, to get the roads cleaned, and the road and other surfaces made good at contractor's cost. 4-inch gauge sandstone ballast.  
Clearing roads and streets.
103. The contractor shall maintain the surface of the roads, streets, &c., after the excavations have been filled in, where the streets, roads, &c., have been broken up or injured during the progress of the work, during the period of the contract time, and afterwards during the period of maintenance, and shall from time to time make good any sinkings in the surface, and shall provide any additional metal, ballast, or other material that may be necessary during these periods. Maintenance of roads, streets, &c.
104. The whole cost of work and materials in connection with the restoration of road and other surfaces to be solely borne by the contractor. Cost.
105. The contractor shall, at the termination of the period of maintenance, procure certificates from the Municipal authorities concerned that the roads, &c., in their respective districts are in a satisfactory condition. Municipal certificates.

*Restoring Buildings, Walls, Fences, &c.*

106. All buildings, walls, fences, and works of any description met with on the site of the works that it is found necessary to remove or that may be disturbed, are to be replaced or repaired, at the sole cost of the contractor, and left, at the completion of the works, in the same order and condition as they were before the commencement of the works.

*Trimming.*

107. On completion of all embankments, cuttings, and filling, all top surfaces and slopes to be dressed and trimmed off to the specified inclinations and surfaces, and to such other inclinations, slopes, and surfaces as may be directed at the time; and all materials accumulating after trimming and levelling top surfaces and slopes, &c., shall, at the completion of the works, be removed, carted away, or spread about, as may be directed by the Engineer; and the schedule rates for filling and excavation shall include and cover all costs for trimming and dressing surfaces, and of removing, carting away, or spreading about all superfluous accumulations at the conclusion of contract.

*Sodding.*

108. On completion of embanking and filling, where ordered, all top surfaces and slopes to be protected by sodding. The surfaces to be sodded are to be boxed out the widths and depths required for the reception of turf-lining. The materials boxed out to be dealt with as provided in clause 107. The sods to be the best obtainable within a radius of 5 miles, of approved quality, not less than 3 inches in thickness and 10 inches square, full cut, with square arrises, to be laid in approved bond on their flat beds, close jointed over all top surfaces of filling or embanking, to be beaten down as the work proceeds with proper tools, as shall be directed, and when finished to present throughout perfectly smooth and plain surfaces. If the season requires it, the turfing to be properly and regularly watered to ensure the grass taking fresh root. The boxing out and turfing to be carried out simultaneously, and no greater area to be boxed out at any time than can be covered with turfing during two working days. The price for sodding to cover all the work described in this clause.

*Soiling and Sowing.*

109. All slopes of embankments, cuttings, and filling, after they have been trimmed, to be covered, when directed, with a layer of surface soil, to be carefully rolled, and when finished to be of a thickness of not less than 3 inches. All slopes, soiled or not soiled, or embankments, cuttings, or filling (where not sodded), after they have been trimmed, &c., and when ordered, to be sown with couch grass seed, as shall be directed, and to be rolled afterwards.

*Piling, Timbering, &c.*

110. Piling to be executed as required and ordered, but the actual quantities required can only be ascertained during the progress of the excavations, and as the trial piles are sunk. Quantities of piling.
111. The whole of the timber which, in the opinion of the Engineer, is required for each part of the various works, or for such portions of the same as he may determine at the time, shall be cut and delivered on the ground prior to contractor commencing the excavation of such part or portion of said work. All timber when brought on the ground to be at once properly and carefully stacked on even plain surfaces, and all timbers to lay perfectly straight in the stacks; all timbers bent, split, unsound, or objected to on other grounds by the Engineer shall be removed by the contractor from the ground within twenty-four hours after such objections have been made known to him, and if he neglects to do so they shall be removed without further notice by the Engineer at contractor's cost; all rejected timbers to be marked by a brand or axe-mark. Delivery.  
Stacking.  
Rejection.
112. All timbers required and delivered for each respective part of works to be, when dressed, pointed, placed, and fixed in position, of the various lengths and dimensions indicated and shown on the drawings referring to such works, or of such other dimensions which the Engineer may deem suitable for the works. Dimensions.
113. All square or round piles shall be sharpened (pointed) at the lower end, the sharpened sides to be cut to a batter of 1 to 6, finished at lowest end with a flatter diamond-cut point, as shown on drawings; the lowest point to be exactly in the straight line of the true axis of the pile, and the sharpened sides to be cut true to the axis of pile to prevent same from twisting and slanting when being driven. Pointing piling.

- Pointing sheet-piles. 114. All lower ends of sheet-piles to be sharpened on one side only to an inclined edge, as shown on drawings, and as shall be directed, to ensure the pile when being driven to drift towards the pile last driven; all sheet-piles of the same length and thickness within each respective panel to have their ends sharpened exactly the same as regards length of cut surface and inclination of bottom edge.
- Dressing piles. 115. All round, square, and sheet piles to be straight-grown timber, and before being driven all square, angle, and guide-piles to be faced truly straight on the sides against which sheet-piles are to be driven and finished as shown on plans; all round piles for staging across rivers, against which planked sides for concrete filling are to be fixed, to be finished with a straight adzed face the depth required for reception of said planking.
- Ringing and shoeing piles. 116. All sheet-piles to be perfectly parallel, and before being driven to be truly faced and fitted to each other within each panel (between each pair of guide-piles), as shown on drawings, forming a straight close joint.
117. All round, square, and sheet-piles are to be hooped with wrought-iron rings at the top, such rings to be of not less than 2 in. x 1 in. iron for the square and round piles, and of not less than 2 in. x  $\frac{1}{2}$  in. iron for the sheet-piles; stronger rings to be provided and used when directed. All piles are to be pointed, as hereinbefore described, and where driven into hard ground, when directed and ordered, the points to be protected by wrought-iron steel-pointed shoes, weighing, except where otherwise directed, 28 lb. each for the main and guide piles, and 8 lb. each for the sheet-piles. All shoes to be provided and made of such shape and workmanship as the Engineer shall approve of. They are to be carefully and truly fitted and fixed on to points of piles, and the lowest points of shoes for the round and square piles to be fixed exactly in a straight line with the axis of each pile.
- Lining out, &c. 118. The exact lines and positions of all piles shall be carefully and correctly ascertained and staked out by the contractor to the satisfaction of the Engineer, and all stakes fixed in water or river-beds to extend above high-water level before any piles are placed and driven. After the staking out, piles to be placed truly plumb, or to such batters as may be directed, in their respective positions between guide-wales. All sheet-piles to be placed, truly plumb, between each pair of guide-piles, and lowered into their respective positions between two walings, fitted and fixed on both sides of guide-piles, as shown on drawings.
- Pile-driving. 119. After the excavations for the various foundations have been completed, timbered, and approved, the pile-driving as indicated on drawings, or where ordered, to be proceeded with as follows:—In order to ascertain the lengths of piles required for the foundations of the different piers and abutments, as indicated on drawings, the contractor is first to drive trial piles, in the manner hereinafter specified, in positions required for permanent purposes, one for each alternate pier, or as shall be directed. Any extra expense in connection with trial piles to be borne by the contractor. After the different lengths of piles required for the works have been in this manner ascertained the permanent piles to be placed in their exact positions, and then to be driven perfectly plumb (or to such batters as may be directed) until tested and approved, as specified.
- Weight and fall of ram. 120. Long piles from 25 feet and upwards, of 12 inches and greater diameters, to be driven with a ram weighing from 20 to 30 cwt., having a drop over head of pile of not less than 5 feet, the drop to increase in height as the pile is driven, as shall be directed. Any pile driven with a ram of 20 cwt. or more, as the case may be, falling 10 feet, to be driven until at the last stroke it does not drive more than the specified depth, and any pile not standing this test to be drawn when ordered, and to be replaced by a longer pile. Shorter piles may be driven with a ram of less weight than 20 cwt.; and when rams of lighter weight are allowed to be used over shorter piles, sheet-piles, &c., the height of drop to vary from 12 to 18 feet, as the Engineer shall direct.
- Pitching piles. 121. All piles to be pitched of such lengths as will ensure good sound heads at the levels shown on drawings, or as may be given at the time by the Engineer. No pile shall be pitched until measured and marked by an officer of the Department, nor cut off until tested and approved. Tenons, 8 in. x 4 in. x 6 in. deep, to be neatly cut on pile-heads. Any pile which may be too short, or which may have been driven out of plumb, or out of the stipulated batter, or which may split below the level of the required height when driven, to be at once drawn, and to be replaced by a sound pile, driven plumb, or battered, as the case may be, of the required length, at contractor's cost. The contractor must be careful not to pitch any pile which he is not satisfied will be long enough. Scarfing of piles is not permitted. The driving of piles to be commenced and carried on in such order of works as specified, and as shall be directed.
- Short piles. 122. Where close piling is shown on drawings, all angle-piles and guide-piles to be driven first, after which the upper guide-wales are to be fitted and fixed on to heads of main piles, and then the whole of the sheet-piles of one panel, after being prepared and fitted, to be lowered and placed into position for driving, after which they are to be driven each a few feet at a time, so that the whole panel of sheet-piles shall be driven to the specified depth, as near as possible together; in this manner each panel is to be driven, one after another, unless otherwise ordered.
- Close and sheet-piling. 123. As the sheet-piling and excavation between same proceeds the lower guide-wales to be fitted and fixed together with all transverse, diagonal, and angle struts as shown on drawings, and with such additional and intermediate struts as the Engineer may deem necessary during the progress of the works.
- Timbering, framing, staging. 124. Capsills to be accurately mortised, placed upon bearing piles, and to bear truly on pile-heads. Transverse sleepers to be spaced as shown, placed upon capsills, halved out  $1\frac{1}{2}$  inch deep at points of intersection, and planks to be laid and close fitted between sleepers upon the capsills. Sleepers and planks to be secured to capsills with wrought-iron  $\frac{1}{2}$ -inch square 9-inch spikes.
- Capsills, transverse sleepers. 125. The net quantities of all permanent timbering, planking, and piling, as shown on drawing, and where ordered, and of all other shoring, timbering, piling, sheet-piling, which the Engineer has ordered to be covered up shall be ascertained by measurement before any timbers are covered up and paid for at schedule rates, which shall cover and include the cost of timber fixed in works, iron used in fixing same, wrought-iron shoes for piles, packing materials, &c.
- Net quantities. 126. The measurements to be taken to ascertain the net quantities of timber to be paid for under this contract shall be as under, viz.:—For all hewn and sawn timber where ordered, in any situation in the construction of these works, the width multiplied by the depth and the actual length (tenons included) shall be the net measurement. For round timber, other than piles, ordered to be covered up the diameter given is to be measured, exclusive of bark, at the smallest end, and the area of such diameter multiplied by the actual length fixed in the works shall be the net measurement. For piles where ordered, in any situation in the construction of these works, the measurement shall be the actual number of lineal feet (tenons included) of each such pile as placed in position, driven, and fixed in the works.
- Measurements.

#### *Carpenter's work.*

127. The whole of the carpenter's work for girders, planks, working platforms, railings, &c., to be of the timbers specified or approved and of the best workmanship, to be framed, fitted, and fixed, finished, cleaned off, rough parts sand-papered (where directed), and completed in the best possible manner, in strict accordance with drawings and measurements indicated and dimensions figured thereon, with all necessary nails, spikes, screw-bolts, drift-bolts, wood-screws, coach-screws, wrought-iron straps, stays, and other fastenings of the best quality and approved workmanship. All holes for bolts, spikes, nails, &c., to be bored with the exact augers, and all mortise holes and tenons, &c., to be cut so as to fit exactly to prevent timbers from splitting. All timber split during the progress of the work and its term of maintenance to be at once replaced by sound timber. All scantlings requiring scarfing in places are to be joined together as shown on sections, and as shall be directed.

#### *Cylinders.*

128. The cylinders for piers, buildings, &c., to be bolted up in the necessary lengths, accurately placed in position, lowered, and the sinking proceeded with by weighting as long as cylinders continue to go down, the tops to be finished at same level. As the cylinders are sinking into the ground the materials inside to be removed by such excavating appliances as may be approved. On completing the excavation of each cylinder to secure and approved foundations the water to be expelled by pressure of air or other approved method, and on having ascertained the cylinder to be perfectly true in position and plumb the bottom to be thoroughly cleaned and levelled, after which the concrete, as specified in clauses 140 to 145, and 148, to be filled in for the first 6 feet under air pressure, or as shall be directed, till twenty-four hours after having deposited same in position. Above this level the cylinders to be filled in with concrete, as specified, to level of top of cast-iron cap.

Concrete filling.

129. The sinking of cylinders to be continued, if required, to greater depths than shown on drawings; such additional depths to be paid for at schedule rate, which is to include all charges, except cost of extra lengths of cast-iron cylinder; a corresponding deduction to be made if secure foundations are obtained at lesser depths.

Sinking to greater depths.

130. If rock, boulders, dead logs, &c., are met with in an irregular manner, or at one side, while sinking cylinders, Rock, &c. the air-lock, or other approved method, must be applied, and the obstructions removed, so as to ensure the cylinders to sink plumb, and to rest on a perfectly flat and solid bottom; no powder or other explosives to be used in the removal of such obstacles. The sinking to be proceeded with as soon as possible after delivery of ironwork, to ensure the erection of bridges, &c., without delay.

131. After the sinking is completed, making up or fitting lengths are to be provided and cast, at schedule rate, so Fitting lengths. as to bring the top of the cylinders to the exact level shown on drawings.

*Sewers, Storm-water Channels, &c.*

132. As the cross-section area of each respective length of tunnel and open trench has been excavated, cleaned, and approved, the sewers, storm-water channels, and other works specified, shown on drawing and determined by the Engineer, to be built therein.

133. In rock and other compact formation the concrete and brick lining to be filled in solid between internal surfaces Tunnel lining. of sewer, storm-water channel, &c. (less, in the case of concrete,  $\frac{3}{8}$ -inch space required for cement facing), and surfaces of tunnel or open trench.

134. Under all shafts, when ordered, relieving arches of brick or concrete to be built of a thickness, form, and width Relieving as shall be directed at the time. Under temporary shafts excavated by contractor for his own convenience, the extra brick arches. and concrete work to be at the contractor's cost.

135. The thickness and description of the lining, whether concrete only, of brick and concrete, or of brick only, Lining. required for the different portions of tunnels and open trenches, depends upon the nature of the ground through which they are driven or excavated, as the case may be, and shall be determined by the Engineer as the excavation advances.

136. In strong compact rock,  $4\frac{1}{2}$ -inch concrete and brick lining will be requisite; and, as the materials occur less compact, two or three rings of brickwork or brick and concrete lining, as shall be determined by the Engineer as the tunnel proceeds, may be required.

137. Junction chambers for sub-main and reticulating pipes, upper inlet chambers in shafts for junctions with Junctions and reticulating pipe-sewers, drop-shafts, penstock and gas-check chambers, flushing-stations, weir-chambers with storm- inlet chambers. water discharge pipes, ventilating shafts, aqueducts on arches, and on wrought-iron girders, syphons, buildings, bridges, culverts, storm-water channel junctions, intersections with existing roads, sewers, and water pipes, branch inlets, man-holes, gullies, road work, &c., to be constructed in connection with main sewers, branch sewers, and storm-water channels of concrete, brickwork, masonry, cement-facing, iron, timber, stoneware, and cast-iron pipes, &c., of the exact sizes, heights, shapes, forms, curves, and with such ornamental red, white, and other bricks, panels, mouldings, piling, &c., as shown on drawings, and as may be ordered and directed at the time. Shafts to be built of concrete or brickwork, at the option of the Engineer, to the thickness and shape shown on drawings, or as shall be directed. Curved junctions for branch, oval, Curved junctions. or pipe sewers, as shown on drawings, and where ordered, to be constructed in concrete, to enter the main sewers at such levels above the invert, with such radius and longitudinal fall as shown, or as shall be determined at the time.

138. Cast-iron pipes, landing platforms,  $\perp$  bars, scupper boxes, gully gratings, girders, over weir and shaft-chambers, Cast-iron work. or other castings, flushing-valves, gas-check frames, penstocks, man-hole covers, saddles, stop-board grooves, &c., to be walled and built in, as shown on drawings; at points of intersection, branch junctions, gas-check chambers, pipe ventilating shafts, where ordered, &c.

139. Step-irons, supports to wrought-iron ladders, holdfasts, ends of wrought and cast-iron girders, bars, &c., to be Building in built into side walls of shafts, and anchor bolts for fixing cast-iron frame for penstocks, gas-checks, &c., to be built into wrought-iron walls of shaft chambers as shall be directed. Flap-traps to be built in where ordered. Permanent putlog holes in shapes of reveals, for temporary staging, are to be left in walls of gas-check chambers, shaft chambers, and shafts where directed; and, in all cases, unless otherwise ordered, the reveals are to be built round of the same thickness of brick or concrete as shown on walls of shafts or chambers at the places referred to. Putlog holes to be included in the schedule price for brick-work. Stop-board grooves to be formed in concrete where ordered.

*Concrete Work.*

140. Bluestone concrete used in these works to be composed of one part of concrete, two parts of sand, and four Bluestone con- parts of bluestone metal. The bluestone metal to be broken to a size to pass freely with its largest dimensions, through a crete. ring of  $1\frac{1}{2}$  inch in diameter, to be free from dirt, quarry refuse, and to be screened through a sieve of  $\frac{1}{8}$  inch meshes, and then to be washed with fresh water until approved.

141. Special concrete, if required, to be composed of 2 parts of cement, 3 parts of sand, and 7 parts of bluestone Special concrete: metal, prepared as specified in clause 140.

142. Sandstone concrete, where ordered to be used in these works, to be composed of 1 part of cement, 2 parts of Sandstone con- sand, and 5 parts of sandstone metal. The sandstone metal to be free from dirt, quarry refuse, sieved (as specified in clause crete. 140), washed, and of a size to pass with its largest dimensions through a ring of 2 inches in diameter.

143. All concrete to be prepared close to where it is required on a sawn timber plank platform. All proportions to Mixing. be correctly ascertained by measurement, the metal to be well washed when put on the platform and levelled at top, the sand to be placed in a level layer upon the metal, and the cement to be placed in a level layer upon the sand; after which all materials to be carefully mixed and turned over twice, and then the whole to be mixed with fresh clean water, and thoroughly turned over twice, and oftener if required, until, in the opinion of the Engineer, it shall be fit for the work before it leaves the platform; it shall then be conveyed to the works as shall be directed, and be used fresh. Referring to clause 10, the gauge-boxes are to be made to the following internal dimensions, viz.:—For stone 3 feet square in plan, and for sand 2 ft. 6 in. square. The depth of each box to be made so as to give the correct proportion of material.

144. If the concrete is made by machinery, all materials to be prepared as previously described, then to be mixed Mixing by dry, and afterwards with fresh clean water, as may be directed and as shall be approved of; to be used fresh. machinery.

145. The different kinds of concrete described under clauses 140, 141, and 142, as bluestone concrete, special concrete, and sandstone concrete respectively, shall be used in the various parts of these works as specified, and as may be ordered at the time.

146. After the excavation for foundation of each respective part of the works, and the piling, planking, timbering, Order of work staging, &c., for same have been completed, and the bottom of excavations has been cleared and approved, the concrete work to be built thereon to the exact dimensions, and of such forms and shapes as shown on the drawings referring to each respective part of said works.

147. The contractor to provide, at his own cost, approved concrete-boxes, centres, staging, shoring, planking, &c., of Boxing, the exact forms, shapes, curves, &c., required; in a proper, secure, and substantial manner, due allowance being made for timbering,  $\frac{5}{8}$  inch thick cement-facing over all internal exposed surfaces of concrete work; and great care being taken that all centering centering. and concrete-boxes can be easily withdrawn. After completion of any portion of the concrete, the concrete-boxes and the centering, as the case may be, shall not be removed until the Engineer or his Superintending Officer has given written permission to that effect.

148. The concrete, after it has been approved of, to be conveyed into cast-iron cylinders, shafts, excavations for Method of work, piers, and other deep foundations, in skips of approved size, and to every other part of the work as may be directed, and as shall be approved of, and tipped into same and upon the surface of each layer from a height not exceeding 18 inches, to be quickly spread out in layers not exceeding 9 inches in thickness. Commencing at each part of the work at lowest level of excavation or surface of work, the concrete to be brought up in horizontal layers or parallel with specified longitudinal gradients of works; each layer, when spread, to be quickly and evenly rammed all over until approved of.

149. In circular, oval, elliptical, and open channels, the concrete to be filled first into central pads, or, in accordance Below springing with the transverse curvature of invert or bottom of channel, into central strips, not exceeding 2 feet in width for wide line. open channels, then into bottom layer right up to extreme width at sides, and then into the curved sides, as shown on drawings, up to top of side walls in open channels, or to level of springing in closed channels.

150. After the concrete has been carried up to the level of springing, all concrete arches to be commenced at both Above springing walls or abutments simultaneously, and carried on towards centre line in radiating parallel strips, spread 9 inches thick, of line. the whole width of arch, or in lengths as specified in clauses 157 and 158, and as shall be directed at the time, and rammed as before described. Where the arch is thicker than 9 inches, the lower layer to be always completed throughout 12 inches in advance of the upper succeeding layer.

- Above arches.** 151. After completion of the closing arch, all concrete work above springing of the same, at sides of arch, in man-holes, chambers, shafts, &c., to be carried up in the same manner as specified in clause 148, and of the exact dimensions, curves, and thicknesses, &c., as shown on drawings.
- Covering up work.** 152. No portion of the concrete work described in the previous clauses (unless otherwise directed in writing) to be covered up with earth or brickwork until it has been examined and approved of by the Engineer. Any leakage that may appear in each layer to be carefully attended to and be made good and repaired at the time, as shall be approved, before each succeeding layer is put on.
- Leakage.** 153. All end faces of layers of concrete to be stepped back at each respective length of sewer or other work, as shall be directed, to be carefully washed clean with fresh water, and then to be grouted prior to each layer of the adjoining length being commenced and joined on to the same.
- Joining lengths.** 154. No traffic shall pass over any fresh concrete work except where such is duly protected against injury by boarding, planks, or any other means approved of by the Engineer or Superintending Officer at the time.
- Injury to work.** 155. In the event of any stoppage occurring to the work, from whatever cause, or in anticipation of rainfall, the contractor, before temporarily stopping work, shall finish it off at whatever level the work may be raised at the time, by thoroughly grouting the whole of the surface with cement grout. The contractor also to provide and have always on hand approved tarpaulins for the purpose of covering all fresh concrete work and brickwork, when ordered, so as to protect the same during all stoppages in the daytime and at night from sun and rain, and during hot or dry weather, to keep said tarpaulins watered to prevent the work from cracking and setting too quickly on the outside.
- Treatment after any stoppage.** 156. In all cases where a layer at mid-day or at evening is left incomplete the said layer shall not be continued after any stoppage until the surface of the lower and the end of the upper layer have been washed clean and then grouted with cement grout.
- Order of work in open trench.** 157. The concrete and brickwork in sewers and channels to be built in open trenches, in three continuous lengths of 40 feet each (unless otherwise directed), that is to say, when the arching-in of the first 40 feet commences, the next length of 40 feet must be completed up to the springing of arch, and the third 40 feet length must be in progress, and the latter so timed that the work is raised up to springing of arch by the time the closing-in of the adjoining length commences.
- Order of work in tunnel.** 158. The concrete and brickwork in sewers and channels on completion of each length of tunnel to be carried on in each length, from the middle towards each end simultaneously, in three continuous lengths of 16 ft. 6 in. each, unless otherwise directed; that is to say, when the arching of the first 16 ft. 6 in. commences; the next 16 ft. 6 in. length must be in progress from height of invert up to the springing of arch; the third 16 ft. 6 in. length must be in progress between floor of tunnel and level of invert of sewer.
- Order of works.** 159. At all plinths for piers of arches and abutments, piers of arches, abutments, between wings of abutments, pilasters, foundations, of buildings, culverts, &c., unless otherwise directed, each layer to be completed right through the whole length and width of the work before the succeeding layer is put on. Where concrete has to be walled or filled in against and between brick facings or masonry, the latter in each case to be well wetted and grouted, and then to be covered with a coat of cement mortar  $\frac{1}{2}$  inch thick before the concrete is built against it, and it is to be brought up simultaneously with same in layers 6 inches thick after ramming, the brick or masonry facings, however, being always kept 6 inches (or more, as the case may be) higher than the concrete work up to the level of string-course or other defined limit, when the work has to be finished level all through.
- Sundry.** 160. The brickwork, masonry, and concrete-filling between all arches and at sides of end-arches to be carried up simultaneously over the whole length and width of every aqueduct, building, or other structure (unless otherwise directed), so that all arches or other structures shall be simultaneously and equally weighted as the brick, stone, and concrete work rises against and over same.
- Aqueducts.** 161. The concrete in piers of arches of aqueducts, abutments, and approaches to aqueducts to be carried up in the first instance from bottom of excavations to level of top of plinths; in the second instance to level of top of skewbacks; in the third instance to level of underside of stringcourse; and in the fourth instance to level of top of coping of aqueducts.
- Aqueducts.** 162. When all piers and abutments of aqueducts have been built to a level of springing of arches or to top of skewbacks, as the case may be, the concrete, brick, and stone arches, as specified, to be built one after another over the openings upon centres, cambered as shall be directed, of such number as shall be specified, strong enough in every part to carry the weight of the arch to be built thereon, till all openings of one aqueduct are arched over, after which the whole of the arches shall be allowed two weeks' time to set and harden before the brick and stone facings, and the concrete, &c., between the arches and at sides of end-arches is commenced. In filling in, between arches and at sides of end-arches the various layers of concrete, of the thickness specified in clauses 148 and 159, as the case may be, to be brought up extending on to extrados of arches till the thickness of each layer at its end is reduced to  $4\frac{1}{2}$  inches above extrados, when it is to be finished at the time with a radiating end face before the succeeding layer is put on. The junctions of the storm-water sewers to be constructed with such curves, shapes, forms, flat arches between wrought-iron rolled girders, &c., as shown on drawings. On completion of junctions, or any lengths of storm-water channel, as may be specified, to exact level of underside of iron girders, the latter to be laid transversely over side-walls of junctions or channels, bedded in and upon special cement mortar,  $\frac{1}{2}$ -inch thick, truly parallel to each other, and spaced 4 feet from centre to centre, or as may be specified, after which the concrete filling along side-walls, between and over ends of girders, to be completed. The arches of 4-feet span or thereabout, with a rise of 5 inches in centre between the girders, to be commenced from lower end, and to advance to the upper end of the junction or channel in each case (all girders being carefully stiffened and held in position by props, as shall be directed), with not less than twelve centres, or as may be directed, of the exact width of junction or channel between side walls. The arches to be built as specified in clause 150, and on completion to form a level concrete decking 3 inches above level of top of girders.
- Junctions.** 163. The concrete lining round sewer on lines of aqueducts and approaches (between underside of string-course and underside of coping, unless where otherwise specified) to be brought up between brick and stone facings (where such occur) simultaneously with same, as specified in clause 159. The concrete to be finished transversely level with underside of copings. This work to be carried on along each line of aqueduct in the manner and in lengths as specified in clauses 161 and 162.
- Iron girders.** 164. In conjunction with the concrete surrounding sewer, where the latter is built upon arches and in embankments, the contractor to provide, fit, place in position, and wall in with the concrete, longitudinally in each corner at top and bottom of concrete lining  $\frac{5}{8}$ -inch diameter bond-rods in 16 feet lengths. The ends to overlap 12 inches, and tied together with binding-wire, and, transversely,  $\frac{5}{8}$ -inch diameter bond-rods  $4\frac{1}{2}$  inches above soffit of sewer of such lengths as to fit between the outer brick lining, or as shall be directed, spaced 10 feet from centre to centre. The cost of providing, fitting, placing, and walling-in said bond-rods to be included in the schedule price per cubic yard of concrete.
- Jack arches.** 165. Special care to be taken by contractor to prevent the concrete, &c., from cracking at ends of each respective and successive length of sewer and channel in any situation in consequence of the draught in same, by providing and carefully closing up ends of sewers or channels with canvas or wooden shields or doors, and by carrying the works on in continuous lengths, without delays and stoppages, so as to prevent air cracks or shrinkage.
- Lining round sewer on arches.** 166. Should, however, cracks occur at ends of any length of sewer, storm-water channel, or other work, during its construction and time of maintenance, they shall be opened up for their whole length and depth, and of such width as may be directed at the time, and filled in with neat cement mortar and grout by the contractor, at his own expense, to the satisfaction of the Engineer, or he may order such cracked parts of the works to be taken down and rebuilt at contractor's cost.
- Bond-rods.** 167. The concrete work comprised in this contract to be completed to the exact dimensions shown on drawings, less  $\frac{5}{8}$  inch at all exposed inner and outer surfaces, and after the boxes and centerings have been removed, all exposed outer and inner surfaces shall present compact, solid, even, plain faces. All faulty and honeycomb portions, cavities, holes, or other defects, to be at once repaired by the contractor, at his own cost, with concrete or mortar, as the case may require, to the satisfaction of the Engineer. No portion of the concrete work to be covered up with earth or brickwork until it has been examined and approved.
- Cracking.** 168. After the concrete or masonry has been built to the exact height and gradient (leaving sufficient space for jointing), the whole of the cast and wrought iron work, after having been washed clean with fresh water, is to be truly laid and jointed in its exact positions, lines and gradients, on fillets of mortar; and as the concrete rises against and around the castings, bond rods, &c., leaving a space of not less than  $\frac{1}{2}$ -inch all round between the concrete and iron, this space round the invert, or underneath bottom of plates and rods, as the case may be, to be filled in with grout or mortar, as shall be directed at the time, whilst above the springing line the outer surface of the castings, &c., to be grouted, and then to be covered with a coat of special mortar  $\frac{1}{2}$  inch thick before the concrete is built on to and around said pipes, castings, frames, &c.
- Repairing cracks.**
- Allowance for rendering.**
- Bedding and fixing cast and wrought iron-work.**

169. All anchor-bolts in connection with cast-iron and wrought-iron work to be placed in the exact positions required ; Anchor-bolts to be washed clean, wetted, bedded upon, and surrounded with special mortar in each case before the concrete is built round same.

170. All stoneware or cast-iron pipes, &c., where they are shown to be or ordered to be surrounded with concrete, to be clean washed with fresh water, to be laid and jointed in the exact lines and gradients on fillets of mortar, and to be grouted all round as the concrete is being built round same. Laying and fixing cast-iron and stoneware pipes.

171. Prior to commencing any concrete which has to be built on to and against rock faces, all shaken and loose rock to be removed ; all rock surfaces to be well cleaned, washed, and wetted, and all beds, open joints, and spaces between concrete and rock faces to be carefully filled in with cement mortar, and the cost of thus preparing rock faces, washing, grouting, flushing, &c., to be included in and covered by the schedule price per cube yard for the concrete. Building on or against rock.

#### *Brickwork.*

172. In executing the brickwork in any situation in the construction of these works, all bricks to be thoroughly soaked in clean fresh water immediately before being used, and all work to be built with whole bricks (except where otherwise directed), of approved shape and dimensions, to ensure the bond of each particular part of the work being executed, in the manner as shown on drawings, and as may be ordered at the time with  $\frac{1}{4}$ -inch joints, each brick to be set full upon and rubbed in cement mortar, and every course to be carefully and thoroughly grouted, and well wetted before the succeeding course is put on, care being taken to keep the inner and outer faces of work clean by placing fillets of mortar on outer and inner edges before grouting. Method of work.

173. The brickwork in arches up to 12-foot span to be built as shown on longitudinal and cross sections in radiating courses, with radiated bricks where ordered, in  $4\frac{1}{2}$ -inch rings in approved bond, the bricks of each course to break joint over the centre of those above or below. Where the brickwork consists of two or more rings, said rings to be built simultaneously, the lower ring to be always completed throughout  $4\frac{1}{2}$  inches in advance of the upper succeeding ring, each brick to be set full upon and rubbed in cement mortar, and each ring to be keyed in centre and to be covered with a coat of cement mortar  $\frac{1}{2}$  inch thick, to ensure the thorough bonding between the different rings. When completing any length of brick closing arch of main sewer, storm-water channels, &c., the courses at end of same to be stepped back, as shall be directed, and the end face of each ring or course to be well wetted, and then grouted, prior to each ring of the succeeding length being commenced. Radiating bricks.

174. The brickwork in arches over 12-foot span to be built in radiating through-courses, of rubbed and gauged bricks if directed, in approved bond ; to be commenced at both abutments simultaneously, the whole width of same, and to be completed in the most perfect manner throughout the full width and thickness of arch, and to be keyed in centre. Arches over 12-foot spans.

175. The brickwork in abutments, abutment piers, wings, parapets, pilasters, spandrels, piers, facewalls, &c., to be built of the various heights, thicknesses, and other dimensions, together with all recesses, projections, panelling, &c., and carried up at each special part or length of work simultaneously with the concrete and masonry, in English or other approved bond, in truly level courses or in courses truly parallel with longitudinal gradient of work, and in such other lines and curves as shown on drawings, or as may be ordered at the time. Where directed, all outer and inner faces of walls to be carried up straight, square, and plumb, with perfectly fair and even faces. Simultaneous progress of various works.

176. Weep-holes of the sizes shown to be left through the brick walls where directed, and everything to be made good where necessary. Faces.

177. The brick-on-edge flooring of invert of storm-water channels on steep gradients, as shown on drawings, and where ordered, in any situation in the construction of these works, to be laid in approved bond ; each brick to be set full upon and rubbed in special cement mortar, after which the whole of the surfaces of the brick-on-edge flooring to be carefully and thoroughly grouted. Weep-holes.

178. The  $\frac{1}{2}$ -inch thick mortar covering (pargetting) of outside faces of brickwork or concrete of ventilating shafts, manholes, sewer-chambers, and sewers, as shown on drawings, shall not be measured and paid for as cement facing, but included in the measurement of the brick or concrete work, and paid for as such. Brick inverts in storm-water channels.

179. All putlog holes to be filled in, taking particular care to match the bricks and the mortar. All external faces of brickwork to be thoroughly cleaned, and all joints to be raked (if ordered  $\frac{3}{4}$  inch deep), and pointed with special cement mortar, and to be finished off with a neatly struck and cut joint. Pargetting shafts.

#### *Cement Facing.*

180. The whole of the internal and external concrete (and brick surfaces, if ordered), where such is shown on drawings, and in any situation in the construction of these works, to be protected by a cement facing to be put on in two thicknesses ; the facing throughout, when finished, to be  $\frac{5}{8}$  inch in thickness. All surfaces of concrete or brickwork to be well wetted before the cement facing is put on. The cement facing of all surfaces of works to be finished, as shown on drawings, and, where directed, with joints struck in imitation of ashlar masonry. Thickness.

181. The different kinds of cement facing with which the exposed surfaces of these works are to be protected are :—  
Cement facing, prepared of cement and sand in the proportion of 1 of cement to 2 of sand ; and special cement facing, prepared of cement and sand in the proportion of 1 in cement and 1 of sand. The different qualities of cement facing, as above described, to be executed in the various parts of these works as shall be specified, and as may be ordered at the time. Proportions.  
Qualities.

#### *Masonry.*

182. All freestone and bluestone ashlar of the exact sizes, forms, and shapes, to be built in where shown on drawings, and where directed, simultaneously with the concrete and brickwork. Stones to be washed clean and to be well wetted with fresh clean water immediately before being used, to be laid upon their natural beds in approved bond, and set solidly upon and in cement mortar in the exact positions required ; after which all joints between stones, between stones and brickwork, and between stones and concrete, to be carefully filled in with grout. Prior to each succeeding course being put on, the surface of the previous course to be well wetted and washed clean. All ashlar stones to be properly lifted by lewis, or as shall be directed when being placed in position. All beds and joints to be punched, axed, and picked, so as to form  $\frac{3}{4}$ -inch joints throughout. All exposed joints of masonry, and between masonry and brickwork, &c., to be carefully raked out,  $\frac{3}{4}$  inch deep, and filled in solid with special mortar, neatly pointed, finished flush with outside faces of work. All masonry to be left perfectly clean at completion of works. Method of building ashlar.

183. Freestone ashlar, to be provided in any situation in the construction of these works, of the exact dimensions, moulded, sunk, weathered, throated, checked, grooved, radiated, curved, channeled, fine-axed, battered, hammer-dressed, worked, rubbed where directed, and finished off in the best possible manner, as shown on drawings, and in accordance with any details which the Engineer may provide during the progress of the works. All stones to be in lengths, as shown, and as shall be directed, with truly squared and axe-dressed beds, joints, and backs. All joints from exposed surfaces of stones, and from faces of concrete work, as the case may be, to be axed-in 2 inches deep. The plinths, where shown on drawings, to be weathered with 2 inches parallel drafted margin, under edge of weathering and at all external angles of same. All external faces of plinths, skewbacks, abutments, piers, wings of abutments, &c., to be pitched-faced, no part of which to project more than approved of beyond true line of wall, with a true pitched line along each exposed arris, and with 2-inch parallel drafted margin as shown. All capstones over pilasters to be of one stone. Holes for lewis-bolts to be sunk where directed, of the depth and size required. All quoins, of the exact sizes specified, to be set in and out bonds to all angles. Freestone ashlar.

184. Bluestone ashlar to be provided in any situation in the construction of these works, of the exact dimensions, forms, shapes, moulded, weathered, throated, fine-axed, sunk for reception of cast-iron bearing plates ; and faces of weir-crest stones to be radiated, and to have vertical bird's-mouth grooves sunk along centre line of joints, as shall be directed ; to be built in with the concrete, brickwork, and freestone masonry, as the case may be, and as the latter rises, where shown on drawings, and as may be directed, to be lewised and set as specified in clause 182. All stones to be washed clean and to be well wetted before being used. Holes for lewis and anchor bolts to be sunk, where directed, of the depth and size required. Bluestone ashlar.

185. Squared freestone rubble masonry in any situation in the construction of these works, to be built of squared hammer-dressed throughstones, unless otherwise directed, in from 10 to 14 inch level courses, as may be directed at the time, or on lines of open channels in courses parallel with longitudinal gradient. Said masonry to be built straight, curved, battered, or sloped, every stone to be set full up on and in cement mortar. When the exposed face of wall is battered, the surface of each course to be at right angles with line of batter, the top course to be built of larger stones, level at top and squared. Squared rubble masonry.



squared at back. All stones to be punched, dressed, and picked to the exact thicknesses, sizes, and forms required, and set in the most approved bond, with joints throughout not exceeding  $\frac{1}{2}$  inch in thickness. All stones to be washed clean and wetted with clean fresh water before being used. Every course to be carefully grouted before the succeeding course is put on. All masonry to be finished with a neatly struck and cut joint as the work proceeds, and to be left perfectly clean on completion.

*Squared Bluestone Pitching.*

186. Squared bluestone pitchers, in any situation in the construction of these works, to be set in sand, in regular 9 inch courses, lengthwise across the channel, in the most approved bond, and in single ring or course round manhole covers, &c. All stones to be dressed and picked so as to ensure the joints all through not to exceed  $\frac{1}{2}$  inch in thickness. No stone to be less than 9 in. x 9 in. x 9 in., but to be longer, curved, and radiated if directed.

*Squared Freestone Pitching and Channeling.*

187. Squared freestone pitchers, in any situation in the construction of these works, to be set upon their natural beds in sand or in cement mortar, as may be specified, in regular 12-inch courses, lengthwise across the course of the channel, in approved bond, with  $\frac{1}{2}$ -inch wide joints throughout. No stone to be less than 12 inches deep, 12 inches wide, and 12 inches in length, but to be longer, curved, and radiated if directed. If the pitchers are set in cement, all stones to be washed clean and well wetted with clean fresh water before being used, to be set full upon and in cement mortar, and on completion of pitching, all joints to be carefully filled with cement grout. All pitching in road channels to be set in sand in regular courses parallel with kerb-stones, in approved bond, with  $\frac{1}{2}$ -inch joints, no stone to be less than 12 inches wide, 3 inches deep, unless otherwise specified, and 18 inches long, but to be longer, curved, and radiated, if directed. On completion of pitching set in sand all joints to be carefully filled in with sand.

*Freestone Kerbing*

188. Kerb-stones in such lengths, picked and axed dressed to such widths, depths, shapes, and forms, with squared and axed ends, insuring  $\frac{1}{4}$ -inch joints throughout, to be set upon their natural beds in sand, in any situation in the construction of these works, along such lines, levels, gradients, and curves as shown on drawings, and as may be directed at the time.

*Pipe laying and Jointing.*

189. After the trenches have been excavated to the exact depths, levels, and gradients, and after the foundation layer of concrete has been filled in where ordered, as the case may be (leaving sufficient room for jointing), glazed stoneware pipes of the required diameter to be laid thereon, along such lines, curves, and inclinations as shown on general plans and longitudinal sections, true, straight, and solid; and for all vertical branch pipe-sewers and ventilating pipe-shafts, the pipes to be set true, straight, and plumb.

190. In clay or similar soil the pipes to rest direct and solid upon the soil. In rock they are to be laid as shown on drawing, on a 1-inch bed of poor mortar, composed of one part of cement and six parts of sand, the cost of same to be included in items for pipe-laying. In soil liable to be scoured out or easily shifted they shall, if directed by the Engineer, be laid on sandstone concrete, as shown on drawing.

191. In every case the pipes shall be laid in such a manner that their barrels shall bear firmly and evenly on their bed, the sockets being entirely free from pressure in the joint-hole, and the spigots concentric with the sockets.

192. The pipes are to be jointed as follows—The 6-inch pipes with tarred gasket  $\frac{1}{2}$  inch deep after setting, and special cement mortar  $1\frac{1}{4}$  inch deep within socket of pipe; the 9-inch pipes with tarred gasket  $\frac{3}{4}$  inch deep after setting, and special cement mortar  $1\frac{3}{8}$  inch deep within socket of pipe; the 10-inch pipes with tarred gasket  $\frac{1}{2}$  inch deep after setting, and special cement mortar  $1\frac{3}{8}$  inch deep within socket of pipe; the 12-inch pipes with tarred gasket  $\frac{5}{8}$  inch deep after setting, and special cement mortar  $1\frac{3}{8}$  inch deep within socket of pipe; the 15-inch pipes with tarred gasket  $\frac{3}{4}$  inch deep after setting, and special cement mortar  $1\frac{3}{8}$  inch deep within socket of pipe; the 16-inch pipes with tarred gasket  $\frac{7}{8}$  inch deep after setting, and special cement mortar  $1\frac{1}{2}$  inch deep within socket of pipe; the 18-inch pipes with tarred gasket  $\frac{1}{2}$  inch deep after setting, and special cement mortar  $1\frac{3}{4}$  inch deep within socket of pipe; the 21-inch pipes with tarred gasket  $\frac{5}{8}$  inch deep after setting, and special cement mortar  $1\frac{1}{2}$  inch deep within socket of pipe; the 24-inch pipes with tarred gasket  $\frac{3}{4}$  inch deep after setting, and special cement mortar 2 inches deep within socket of pipe.

193. The tarred gasket to be placed in the faucet and set tight round spigot end of pipe, after which the remaining space in faucet to be cleaned, wetted, and filled in with stiff special cement mortar, packed in solid, splayed off outside to an angle of 45 degrees, and neatly finished off. The inner joints between pipes to be carefully filled with special cement mortar all round, neatly wiped off as a finish. Each pipe-length thus finished to be carefully cleaned out before another pipe-length is added.

194. Junction pipes of any desired size are to be laid into the line of pipe-sewers wherever required by the Engineer. The socket ends of all junction pipes, junction blocks, junction holes, ventilating pipes, and dead ends are to be protected against the ingress of foreign substances, and made easily accessible for effecting future connections, by being closed with earthenware discs having a temporary watertight joint all round, the cost of providing and fixing same to be included in items for pipe-laying.

*Cast-iron Pipe laying.*

195. After the pipe-trenches have been excavated to the exact depths, levels, and gradients required, cast iron pipes of the diameters shown or ordered, to be laid along lines (curved or straight), and solid upon the bottom of the trench, or upon a foundation layer of concrete, and the vertical pipes placed as shown, leaving sufficient room for jointing.

196. The pipes are to be jointed as follows—The 6-inch and 7-inch diameter pipes with spun-yarn  $2\frac{3}{4}$  inches and 3 inches deep respectively after setting up, and soft lead  $1\frac{1}{2}$  inch deep after setting up; the 8-inch, 9-inch, and 10-inch diameter pipes with spun yarn 3 inches,  $3\frac{1}{4}$  inches, and  $3\frac{1}{2}$  inches deep respectively after setting up, and soft lead  $1\frac{1}{2}$  inch deep after setting up; the 11-inch, 12-inch, 14-inch, 15-inch, and 18 inch diameter pipes with spun yarn 3 inches, 3 inches,  $3\frac{1}{2}$  inches,  $3\frac{1}{2}$  inches, and  $3\frac{1}{2}$  inches deep respectively after setting up, and soft lead  $1\frac{3}{8}$  inch deep after setting up; the 20-inch, 22-inch, 24 inch, 26-inch, 28-inch, 30-inch, 32-inch, 34-inch, and 36 inch diameter pipes with spun-yarn 3 inches,  $3\frac{1}{4}$  inches,  $3\frac{1}{2}$  inches,  $3\frac{1}{2}$  inches,  $3\frac{1}{2}$  inches,  $3\frac{1}{2}$  inches,  $3\frac{1}{2}$  inches, and  $3\frac{1}{2}$  inches deep respectively after setting up, and soft lead 2 inches deep after setting up.

197. Should the faucets of pipes used in these works, in places, be of greater or lesser depths than indicated in the previous clause, then the spun yarn packing is to be of greater or lesser depths as may be required, the depths of the lead joints to remain as specified. Expansion joints to be made in the same manner, but of such special depth of lead joint, with or without spun-yarn packing, as shown on drawings and as may be ordered at the time. All curves on lines of pipe-sewers to be accurately formed with the spigot and faucet joints of the pipes without any abrupt horizontal and vertical dip, rise, or bend. The spun-yarn to be tightly platted or laid round each spigot end, so as to fill the socket of each pipe after setting up to the exact depth specified, leaving in each instance the remaining depth of faucet for the specified lead joint, the latter to be made at each joint in the trench with one running, and when cold to be set up with proper irons to one smooth, even, plain surface all round the pipe, and  $\frac{1}{8}$  inch within socket of same.

198. The setting up of all lead joints to be made with a proper set of setting irons, commencing from outer surface of spigot end with  $\frac{1}{8}$  inch thick setting irons, and continuing towards outer edge of lead joint, with setting irons advancing gradually by  $\frac{1}{16}$  inch in thickness at the time. Special setting irons to be used for setting up expansion joints. After the pipes have been laid and the joints of every description made, examined, and approved, they are at once to be covered up, but in no case are they to remain longer than twelve hours uncovered after they have been approved of.

199. Faulty and objectionable lead joints to be immediately and carefully chiseled out (they are not allowed to be burnt out) and fresh lead joints to be made and set up until approved of. Attempts to repair defective joints are under no consideration to be permitted.

*Road-making.*

200. The different roads shown on drawings are to be formed 30 feet wide between edges of slopes, whether on embankments or in cuttings. The longitudinal gradients of approaches to be at an inclination of 1 in 20, or as shall be directed. All roadways to be formed with a crown, which at the centre line is to be 6 inches higher than the edges.

201. After the roadway has been formed and approved, it is to be carefully boxed out along centre line, if ordered, for the reception of the road material, 8 inches deep for ballast, and 4 inches deep for metal—12 inches in all, by a width of 24 feet.

202. After the boxing-out has been completed, its bottom surface to be covered by a layer of 4-inch gauge sandstone ballast, spread 8 inches thick throughout, and then covered with bluestone metal spread 4 inches thick throughout. Ballasting and metalling.

203. After the metalling has been completed and approved, the whole of its surface to be covered with about one-eighth of its own bulk of bluestone chippings of a uniform thickness, after which the whole road surface to be watered and rolled until approved. Blinding.

204. The stone used for metalling to be basalt or other similar hard stone of approved quality; to be broken to angular fragments of a size to pass freely with their largest dimensions through a ring  $2\frac{1}{2}$  inches diameter, and to be free from dirt, quarry refuse, &c. Quality of metal, size.

The prices per cubic yard for bluestone metal and sandstone ballast for road surface to include the cost of providing and spreading blinding.

#### *Tarred Metal Deck.*

205. After the tarring of upper surface of metal flooring, and after the sand-filling over arches and abutments of aqueducts has been completed, levelled, and approved, or in any other situation in the construction of these works, the whole of these surfaces as shown on drawings, to the thickness figured or ordered at the time, to be covered with the tarred metal decking, as follows:—

206. The stone to be basalt, broken to a 2-inch gauge, free from dirt; the screenings to be crushed from the same stone, and to pass through a  $\frac{5}{16}$ -inch sieve. All stones and screenings to be perfectly clean and dry, to be heated before admixture with tar. The tar to be coal-tar, free from all adulterations, and boiled a sufficient time to get rid of the light oils before being used. Stone for tar.

The stones and screenings to be mixed with the boiled tar separately; to be then stacked where directed, so as to allow the surplus tar to drain away for at least three weeks before being laid in position. Tarring and stacking.

207. The 2-inch stone to be spread over the whole bridge, upon the concrete filling of roadway, and upon the 7-inch thick sand layer of footpaths, between kerb-logs, to such thicknesses and surfaces, and with such curvature to roadway, when rolled, as shown in drawing, and to be then covered with about one-eighth of its own bulk of screenings. Both layers to be well rolled and cross-rolled with a 30-cwt. roller, having not less than a 3 feet width of face, until they form solid compact surfaces to the required levels and curvature. Laying and rolling.

208. The sides along kerb-logs and all places where the roller cannot work, to be well punned by hand with a flat-faced 42-lb. iron rammer. When approved by the Engineer, the whole of the surfaces to be brushed over with a coat of hot coal-tar, and a layer of heated fine bluestone screenings, with dust left in, spread over it. Punning.

#### *Coke Concrete Deck.*

209. Coke concrete to be provided, placed in position where directed in the manner specified for other concrete, and to be mixed as described in clause 143, but in the following proportions:—16 cubic feet of approved coke broken to a strict 1-inch gauge, 8 cubic feet of sand, and 1 cask of cement.

#### *Fencing.*

210. Fencing is to be erected in such line and situation, and of such description as shall be directed, and as marked out by the Superintending Officer, and of the form and to the dimensions marked on the drawings. Land to be fenced where required.

211. Ordnance fences to be provided, framed, fitted, and erected where ordered, of sawn hardwood timber, unless where otherwise specified, as viz.: Posts 6 in. x 4 in. x 6 ft. 6 in., top rail 4 in. x 4 in., intermediate and lower rails, 4 in. x 3 in. Posts spaced 6 ft. 6 in. from centre to centre, sunk in rock not less than 18 in., and into other ground not less than 2 ft. 6 in. deep. On road embankments, where ordered, posts to be 7 ft. 9 in. long, mortised into sills 9 in. diameter x 5 ft. long, secured by 1 inch diameter hardwood tree-nail, stayed to posts by 4 in. x 4 in. struts, secured to posts and sills by  $\frac{5}{8}$ -inch screw-bolts; and  $\frac{3}{4}$ -inch diameter spikes,  $7\frac{1}{2}$  inches long. Angle and end posts, 10 inches diameter at smallest end, x 8 feet long, to be sunk 3 feet deep in the ground, mortised 6 inches deep for reception of ends of rails. Tops of round posts to be protected by caps of 6-lb. sheet-lead, secured to posts by lead-headed nails 2 inches long, and wrought-iron 2 in. x  $\frac{1}{4}$  in. rings, secured each by four 3-inch wood screws. Sawn posts to be notched at top for reception of top rail and halved out for reception of intermediate and lower rails, spaced as shown. Top rail to be laid aris uppermost into notches, secured to posts with 2 in. x  $\frac{1}{8}$ -in. hoop-straps, and four 2-inch long wood screws to each strap. Intermediate and lower rails to be fitted flush with inner faces of sawn posts, and secured to each with two 4-inch wood screws. All sawn timber above ground to be planed, all scarf-joints of rails to be made as directed, over posts only, and all sills, struts, and ends of posts under ground to be charred thoroughly. The ground round posts to be well rammed, and the clearing spaces round ends of posts stepped in rock holes, to be carefully filled in with cement grout. Ordnance fencing.

212. The split timber fencing may be of one or more of the three following descriptions:—

1st. Fence, consisting of split hardwood posts, two split rails (wired if shown), and round posts where required. Description of split timber fences.

2nd. Fence, consisting of split hardwood posts, three split rails, and round posts where required.

3rd. Fence consisting of split hardwood posts, two split rails, covered with split hardwood palings, with round posts where required.

213. Posts to 6 ft. 6 in. long, 8 inches broad by  $2\frac{1}{2}$  inches thick, except those for the paling-fence, which shall be 7 feet long, with mortises 6 in. x 3 in., cut square to the gauge shown on the drawings. All posts to be charred for a length of 2 ft. 6 in. from the bottom, sunk 2 feet into the ground, set uniform and upright, and spaced 8 ft. 3 in. apart from centre to centre, and the earth well rammed in round them until the posts stand solid and firm. Posts.

214. Rails to be 9 feet long, the top rail not less than 7 in. x 2 in., and the bottom rail not less than 8 in. x 2 in. in the two-rail fencing, and in the three-rail fencing the centre rail to be not less than 8 in. x 2 in., and the bottom rail 7 in. x 2 in. Tenons to be 6 inches long, carefully adzed to fit closely into the mortises, shouldered square with the saw, and fitted so as to butt close up to the posts. Rails.

215. Palings are to be sound, straight, cleanly split, and free from sap, and of approved timber, 5 feet long, not less than 4 inches wide, and  $\frac{1}{2}$  inch thick. They are to be sawn off square, placed upright, close together, and to a straight line on top, and securely fixed by  $1\frac{1}{2}$  inch strong wire nails, two nails to every paling in each rail. They are to be further secured along the rails by galvanised hoop-iron of 18-gauge, 1 inch wide, well nailed by  $1\frac{1}{4}$  inch clout nails at intervals not exceeding 12 inches apart. Palings.

216. At all intersections with existing fences, and at all angles, a round post is to be provided and fixed, 9 inches in diameter, charred for a length of 3 feet from the bottom, and sunk 2 ft. 6 in. into the ground, and the earth well rammed in until the post stands solid and firm. These posts are to be of such length as to leave the top 6 inches above the upper rail. At existing fences the junctions are to be made good and connected with these posts, which are to be mortised for the rails to suit the fence in the same manner as shown on drawing. Round posts.

217. Where necessary, posts, either round or split, are to have a hardwood strut 6 in. x 3 in., checked at upper end into the post, and secured by a 6 in. x  $\frac{1}{2}$  in. round spike. A hardwood stake, 3 ft. long x 8 in. x 3 in., to be driven close into the foot of the strut, as shown on drawing. Post strutted where necessary.

218. The crossing of ditches, watercourses, or hollows in the ground, are to be made secure, either by supporting the fence on logs, extra long posts, or as may be directed. Crossing ditches or sudden depressions.

219. The fencing is to be erected to a true line on top, and is not to follow the minor irregularities of the ground.

220. The wire used in fences to be that known as No. 8 "best best annealed drawn," or other approved fencing wire; to be passed through the posts, which are to be bored for the purpose with a quarter ( $\frac{1}{4}$ ) inch auger, and strained tight by means of F. Morton & Co.'s or other approved straining bracket, fixed to the straining posts by wood screws or spikes, so as to suit the gauge, as shown on the drawing. Fencing wire and straining brackets.

The works and materials comprised in clauses Nos. 217, 218, and 220 to be included in the schedule rates for fencing.

#### *Wrought-iron Work.*

221. All wrought-iron spindles, bolts, L, T, and U irons, flat and round bar, plates, straps, axles, pins, anchor-bolts, rolled girders, nuts, washers, rods, rivets, holding-down bars, gratings, frames, keys, chains, &c., to be of the exact dimensions and forms shown on drawings. The greatest care to be taken in any welds to ensure perfect soundness, and the contractor to be at the expense of any test which the Engineer shall think fit to submit the welds to. All plates, bars, channel-irons, rods, &c., to be perfectly true and of even uniform thickness; all angle-irons and bars to be sound, uniform, and Wrought-iron work.

and Welds.



and regular on edges; all joints and edges to be truly planed to the dimensions on drawings; all wrought-iron parts to be rolled or forged out of one piece, unless otherwise specified and directed. Ends of spindles, shackles, &c., to be forged with eye-holes, and holes for male and female joints of the exact forms. All bolts, handles, hand-rails, spindles, keys, chains, pins, axles, bars, crosses, &c., to be forged with protecting necks, and welded with ends of large diameters or otherwise for screw ends, and made of the exact shapes, forms, dimensions, lengths, widths, and diameters shown on drawings, with angular and square threads, as the case may be, to all bolts, spindles, &c., with the correct pitch, angle, and depth. All portions fastened with screws, bolts, or rivets to fit close together. The chains attached to blades of penstocks, and the whole of the wrought-iron gratings, channel-irons, &c., connected therewith, wrought-iron girders to working platforms, hand-rails to platforms and stairs, to be galvanised before being fixed in the works.

- Joints.** 222. All joints in plate, angle T irons, &c., to be made only in such positions as shown on drawings and where directed; and all covering plates, wrappers, T, and angle irons to be truly cut at ends to insure a perfect fit.
- Screw-bolts and screws.** 223. All screw-bolts and screws to flanged pipes, penstocks, valves, all other castings and wrought ironwork of every description to be of the exact diameters and lengths shown on drawings, with hexagon heads and nuts, and to be angular threaded with the correct pitch and angle of the Whitworth screw.
- Joints of shafts, &c.** 224. Joints of shafts, spindles for penstocks, axle shafts for strainers and traveller, engines, &c., to be made by said shafts being truly turned and cut at ends, and cast-iron flanged and turned sockets, with turned spigot and faucet, the internal diameter of socket to be turned exactly, and slightly of less diameter than ends of shafts. Sockets and ends of shafts to be grooved, as shown for steel key. Sockets to be heated and then fitted on to ends of shafts with keys, after which the flanges to be bolted together, forming coupling, as shown on drawings.
- Joints and working parts.** 225. All joints and working parts of wrought iron on penstocks, valves, strainers, standards, engines, travelling cranes, travellers, gratings, troughs, louvre shutters, brackets, &c., to be turned, scraped, or ground and glazed bright, as the case may require, and as shall be directed.
- Handles and levers.** 226. All handles and levers for working penstocks, valves, strainers, travellers, travelling cranes, &c., to be ground and glazed bright.
- Rivets and bolts.** 227. The rivets throughout to be made from  $\frac{1}{2}$ -inch,  $\frac{3}{8}$ -inch,  $\frac{1}{2}$ -inch,  $\frac{3}{4}$ -inch, 1-inch, and  $1\frac{1}{2}$ -inch iron respectively, with heads and necks, as shown on drawings. The Engineer may require any holes to be drilled and the bolts turned for same, or he may order bolts to be substituted for rivets, or other changes of the kind, in such places as he may consider necessary, without extra charge.
- Holes for rivets, bolts, &c.** 228. All rivet, bolt, and screw-holes to correspond as to diameter and position with the drawings, and to be carefully drilled parallel, and at right angles with face of work. All the holes in booms of main girders, bearing-plates, lattice-bars, wrought-iron aqueduct pipes, rolled L, channel, T, and flat bar irons to be drilled—the respective pieces being clamped in their proper positions and secured under drill and bored right through; holes in cylinder-bracing, cross-girders, and wind-bracing girders may be punched. No drifting or rhymering to be done without the consent of the officer in charge, and then rhymering only when the plates can in no other way be made to coincide. Holes which are directed to be punched or drilled at the building site to be about  $\frac{1}{16}$  inch narrower than the diameter of the rivet required, so as to ensure a good fit after its being enlarged with the rhymer. Where several holes meet each other in the parts to be united, a horizontal dislocation of not more than 5 per cent. of the diameter of the hole is allowable, the hole then to be made perfectly equal with the rhymer, and not by filing on one side, and rivet-bolts of proportionately large size to be used in holes thus enlarged.
- Riveting.** 229. All rivets to be inserted at a bright heat, after being carefully freed from scales, into the duly cleared holes, to be quite firm after the head is completed. If not firm, rivets to be at once removed and replaced by others, and of larger size when directed. In putting together parts, care to be taken that none of them are forced into one-sided tension; any portions distorted in riveting the connections to be at once loosened and the faults remedied. All rivets to be finished with cup heads, and when countersunk the sinking to be drilled and the heads to be finished perfectly flush. All rivets and heads of bolts to be countersunk where plates, when fixed, will bear on other work, and where they form the inner surfaces of aqueduct pipes. All riveting to be done in the neatest and most workmanlike manner.
- Wrought-iron gratings.** 230. Wrought-iron gratings to be of the exact dimensions, straight or curved, as the case may be, the bars spaced and riveted as shown, all bars to have rounded-off top surfaces. All hooks, rings, and chains attached to flushing-valves, &c., to be galvanised before being fixed in the works.
- Wrought-iron ladders.** 231. Wrought-iron ladders, in lengths shown on drawing, and as may be ordered, consisting of  $2\frac{1}{2}$  in. x  $\frac{5}{8}$  in. uprights, spaced  $13\frac{3}{4}$  inches apart, and  $\frac{3}{4}$ -inch round bar-rungs spaced 12 inches from centre to centre. Joints of uprights to occur only at supports, where directed. Supports, spaced as shown, to consist of two 6 in. x 3 in. x  $\frac{3}{4}$  in. channel-irons fixed to uprights with  $\frac{3}{4}$ -inch screw-bolts, stiffened off at ends, at top and bottom, with  $\frac{1}{4}$ -inch plates varying from 12 inches to  $13\frac{1}{2}$  inches in length, riveted on to top and bottom flanges of channel-irons, as shown.
- Cast-iron Work.*
- Castings.** 232. The whole of the castings to be perfectly sound, free from all cold shuts, honeycomb, holes, or other defects; to be cast in dry sand moulds, unless where otherwise directed.
- Castings.** 233. All castings to be true in sectional form, straight longitudinally where shown to be so, or of such shapes, projections, curves, angles, and forms as shown on drawings; and each portion of such castings to be of equal strength and of the specified thickness throughout its respective length.
- Castings.** 234. The external and interval services of all castings to be perfectly clean and smooth, and in strict accordance with sections.
- Castings cylinders and pipes.** 235. All cylinders and pipes to be cast vertically, with the socket or flanged end downwards; to be straight longitudinally; all straight pipes with faucet, or flanged, and with spigot ends, to have the latter cast 9 inches longer than shown on drawings; all cylinders to be cast with such head of metal as shall be directed. After the castings have been cleaned and coated, the head of metal over the cylinders, and the 9 inches at spigot ends of pipes to be cut off, so as to leave same perfectly square on section and true and equal in circumference, so as to fit the socket, leaving an equal space all round of the exact thickness shown on drawings for lead joints.
- Faucet ends.** 236. The faucet of each pipe or casting to be perfectly square and true, of the exact dimensions shown on drawings, and to be cast with a groove of the size and depth as required by the Engineer. The faucet of large circular and oval pipe for expansion joints to be cast as shown with an inner narrower faucet and projecting rim, and both inner sides of narrower faucet and of projecting rim to be truly turned and polished.
- Faucet for expansion joint.** 237. The feathers and flanges, where such are shown, to be of the exact widths, forms, and thicknesses, and all surfaces of contact to be planed and turned to true and even faces.
- Feathers and flanges.** 238. All spigot ends for expansion joints, where shown on drawings, to be cast with a recessed end for reception of wrought-iron ferrule on inner face, and a corresponding projecting face on the outside; said recessed inner and projecting outside faces to be truly turned and polished to the exact cross section for reception of lead joint, gun-metal packing ring, and wrought-iron cover-plate, as the case may be.
- Spigot ends for expansion joints.** 239. The thimbles for expansion joints for large, circular, and oval pipes, to be cast with faucets as described in clause 236, and with web-plates, ribs, and bed-plates cored out, with bosses truly bored for heads of anchor-bolts; the whole to be of the exact shapes, forms, and dimensions as shown on drawings.
- Thimbles for expansion joints.** 240. The flanges of gas-check frames to be provided with a projecting face, planed and turned to true and even faces, of the exact dimensions shown on drawings.
- Gas-check frames.** 241. All holes in hinge-brackets at top of gas-check frames to be truly bored to the diameter required for the reception of hinge-bolts.
- Boring holes.** 242. All bolt-holes to be of the exact sizes, spaced as shown, and to be truly bored and turned.
- Bolt holes.** 243. All flange-joints, unless where otherwise directed, to be made tight with red lead.
- Flange joints.** 244. Frames of penstocks to be of the different parts, and of the exact shapes, forms, and dimensions, with all screw and bolt holes, and the exact circular valve openings, with flanged end at back, projecting rim round opening in front and at sides of same, with cap-pieces on top, upright slide frames, flanged, bolted together, cored out with bosses and web-plates between, to receive front guide-plate, with inner projecting faces screwed into bosses of upright frames. Guide-pieces, with flange and web, faced on surface of contact, with boss in centre, the latter truly bored and turned for reception of brasses and spindle to pass through, fitted with bolt-holes, and screwed on to guide-plates.
- Penstock frames.** 245. All landing and other plates and grates to be complete with ribs, flanges, hinged and other lids, close or ventilating covers, girders of the exact shapes, forms, dimensions, projections, recesses, &c., as shown on drawing.
- Landing grates and plates.**

246. Valve blades to be of the exact diameters, forms, shapes, and dimensions, with circular projecting faces back and front, and vertical projecting faces corresponding with and bearing on projecting faces of guide-plates and framing, and vertical racks or brackets, with eyeholes truly bored for fixing foot of valve spindle, as the case may be. All seatings to be truly faced and bored out to receive gun-metal faces, and all stuffing boxes, glands, foot-step bearings, and journal boxes to be bored and turned and polished where directed. Valve blades for penstocks.

247. All girders, brackets, standards, wheels for chains, and balance weights, tubes, boxes, glands, plumber-blocks, and boxes for lifting or turning spindles, as the case may be, foot-brackets for upper spindles, flanged pipes for spindles, street-boxes, &c., of the different parts, and of the exact lengths, forms, and dimensions, to be truly faced, turned, and polished at all joints, bored and turned for reception of screws, nuts, and brasses, with all bolts and screw-holes of the sizes shown, bolted at all joints, and all faces of flange-joints and working parts and other faces, where directed, to be truly planed, turned, faced, and scraped, to the necessary surfaces. Sundry ironwork to be turned and bored.

248. All penstocks, scour-valves, &c., to be carefully and truly fitted and fixed together, with all lifting and turning gear, gun-metal facings, spindles, wrought-iron work, street-boxes, screws, bolts, nuts, &c., complete, in strict accordance with drawings and dimensions figured thereon, and all valves to close watertight. Penstocks, scour-valves to be fitted.

249. The frame and flap-valve of flushing valve, with bracket, pulley, &c., to be complete, with wrought-iron galvanised chain, to be cast of the exact diameter, shapes, forms, and dimensions; the flushing valves to have a projecting rim all round, the inner face truly faced and turned to a "V shape" of the exact dimensions, so that when the flap is placed in position the edge of the V rim to lie exactly against the centre line of the square tuck or lead-packing of opposite groove in frame, planed out to a dovetail for the purpose. Flushing valve.

250. Couplings, flanged, turned, bored, faced, with turned and bored spigot and faucet, and bolt-holes of the exact diameters, to be of the exact forms and dimensions for making joints of valve-spindles, &c. Couplings.

251. Cast-iron frame with 22-inch diameter opening, with non-ventilating lid fitting easily into frame, complete, with sawn and tarred ironbark wood-bricks fitted into panels, the whole to be in strict accordance with drawings and dimensions shown thereon. Cast-iron frame.

252. Scupper-pipes, with cistern-heads and grating-cover for inlets of scupper-pipes, and plain cover-plates over inlets of scupper-pipes, as shown, to be cast to the exact shapes, forms, with the exact openings, and to the dimensions figured on drawings. Scupper-pipes, grating-covers, and cover-plates.

253. All grooves for stop-boards to be cast with a connecting ledge at top, to be cut off when casting is completed. All grooves to be cast true, of the exact dimensions, shapes, and forms; and all working parts of frames and slide-valves, grooves, and stop-plates, to be truly planed and faced so as to fit, but not too tight. All stop-plates to be complete with wrought-iron shackles, 12-foot galvanised chain, hook, and rings. Stop-board grooves.

#### Gun-metal Work.

254. All portions tinted yellow on drawings, as in nuts, bolts, shackles, bearings, and working parts, nuts and naves of wheels, seatings of valves, penstocks, standards, hangers, and brackets, and all other brasses in working and lifting gear, &c., to be made of gun-metal. The gas-check flaps to be of muntz or delta metal. Gun-metal tinted yellow. Gas-check flaps.

255. The whole of the castings to be solid and perfectly sound, and free from all honeycomb, holes, or other defects. Castings.

256. All spindles to be cast on end, having a riser on top of each not less than 3 feet in height, after which they are to be turned and finished to the exact lengths and diameters; to be straight, and work true in stuffing boxes, nuts, glands, &c. Spindles.

257. All screw ends and nuts, unless where otherwise specified and directed, to be angular, threaded with the correct pitch and angle; and all naves of wheels, nuts for lifting gear in standards and for off-let valves, bearing nuts of end brackets for shafts, &c., where shown, to be turned with the square thread and correct pitch and angle of the Whitworth screw. Nuts and screws.

258. All nuts, naves, pins, lubricators, shackles, eyeholes, sockets, hinges, hinge-bolts, guide and other brasses in plumber-blocks, brackets, standards, valves, penstocks, &c., to be truly bored, turned, faced, and finished to the exact lengths and diameters, shapes, and forms, and to be straight and work true on all bearings and working faces. General directions for finished work.

259. All projecting rims, straps, eye-hole brackets, &c., to be provided and fitted on to gas-check flaps, to be cast of the sizes, shapes, and forms as shown on drawings, to be faced on surface of contact, and to be soldered on to the flaps with zinc, after having been placed truly in position, and then riveted as shown. All gas-check flaps to be of the exact thickness shown on drawings. When the rims and straps for each flap are not cast in one casting, then they are to be cast in parts as shall be directed; and prior to fixing such parts in position, they are to be truly fitted and jointed together. All such joints to be scarfed and braced, as, viz., the edges filed or scraped clean and bright, covered with spelter and powdered borax, and exposed in a clear fire to a heat sufficient to melt the solder, which, for all scarf-joints, to be an alloy composed of four parts of copper to three of zinc. All scarf joints to be placed where directed. All hinge-axes to be truly turned. All links of shackles to be made with one joint, scarfed, brazed, and riveted together. Gas-checks. Soldering.

260. At expansion joints of large cast-iron pipes, where shown, a gun-metal packing ring of the size specified to be provided, placed, and fitted round spigot end of pipe, carefully set up flush with end face of inner recess of faucet. Packing ring.

261. All portions of castings, as exposed surfaces of nuts, hinge-bolts, hinges, shackles, rims, straps, brackets, hooks, links, &c., are to be cleaned as they leave the mould, and all irregularities to be removed. All other portions of gun-metal work to be truly faced on all surfaces. All gun-metal facings and fittings to be truly turned and faced on all surfaces, to fit exactly, to be forced into positions, screwed where shown, and to sit perfectly firm and true.

#### Wrought-iron Work, Gun-metal Work, and Cast-iron Work.

262. The whole of the wrought-iron, cast-iron, and gun-metal work to be of first-rate quality and workmanship, in strict accordance with the specification and the dimensions and patterns shown on the drawings, and any details which the Engineer may provide during the progress of the contract. Quality and workmanship.

263. Wrought and cast ironwork and gun-metal work not to be more than 3 per cent. below the scheduled weight, and the contractor shall only be entitled to payment of the weights as per schedule, at the various prices set forth therein, and payment will not be made for any excess on such weights. Weights.

264. All ironwork and gun-metal work supplied by Government to the contractor to be delivered free of charge at the various sites of the works where they are required. For each article so delivered the contractor shall give a written receipt, after which he shall be held solely responsible for same; and shall, if any such article be lost, stolen, damaged, or destroyed, refund the cost to the Government. Contractor to give a receipt for ironwork supplied.

265. All ironwork and gun-metal work, &c., provided by the Government which, at the completion of the contract, by direction of the Engineer has not been built or permanently fixed in the works shall be conveyed by the contractor to the site of the Field Office, or to the iron store at Camperdown, as may be directed. Surplus ironwork.

#### Painting.

266. All wrought-iron work (except where otherwise specified and directed) before leaving the foundry to be scraped and cleaned, and well coated with boiled linseed oil; and prior to being fixed in position (excluding internal surfaces of circular and oval wrought-iron tubing, and excepting all working parts) after it has been cleaned and scraped free from scales, &c., and inspected, to receive two coats of anti-corrosive paint over all surfaces, and after being fixed in position, to be finished with two coats of best oil-colour, in approved tints. Wrought-iron work.

267. All bolt-heads, washers, nuts, straps, and all other exposed ironwork of timber bridges above level of kerbs, ordnance fencing, &c., to be finished with two coats of black varnish instead of oil-colour.

268. The whole of the cast-iron work to be properly cleaned immediately after completion; and, after being inspected, except where otherwise specified, to receive over all surfaces two coats of anti-corrosive paint (except working parts and joints), and to be finished afterwards with two coats of best oil-colour, in approved tints. Cast-iron work.

269. All carpenter's work of timber bridges above level of kerbs, and all ordnance fencing above ground, handrails, travelling cranes, &c., to be properly prepared, knotted and primed, and painted with four coats of best oil-colour, finished with approved tints. All tenons, mortises, notches, halvings, joints, scarfs, and butting surfaces to receive two coats of approved paint before being fixed in position. Carpenter's work.

270. No paint to be applied during or immediately after wet weather, or while surface of timber or metal work is wet; and an interval of forty-eight hours must elapse between each application.

#### Tarring.

*Tarring.*

- Castings.** 271. All cast-iron cylinders, pipes, short lengths, bends, junctions, and any other castings, &c., which will be placed or laid under water, or which are to be covered up in earth, concrete, &c., and all non-ventilating man-hole covers, street-boxes, flushing-flaps and frames, scupper pipes, precipitating tanks, grooves, landing-plates and frames, grates, cover-plates, gully grates, &c., as soon as they have been cast and inspected, to be properly cleaned and then heated, and whilst hot to be dipped or coated twice in hot gas-tar.
- Wrought-iron work.** 272. All flat, segmental, and buckled plates, rolled girders, bulb T irons, &c., before being placed in position, unless otherwise ordered, to receive one coat of tar, and after erection is completed to receive a second coat; the tar to be coal-tar, mixed with kerosene in the proportion of three of tar to one of kerosene, and applied hot.
- Timber work.** 273. Kerbs, flooring planks, timber in girders, longitudinal stringers, cross-girders, corbels, capsills, sills, piles, pier-bracing, abutment platforms, ends of handrail posts below level of tops of kerbs to receive three coats of tar and composition; the first coat to be all tar laid on hot; the second and third coats to be composed of seven parts coal-tar, four parts of Stockholm tar, and one part of pitch thoroughly melted together and applied hot, the last coat on top of deck to be well sprinkled with a layer of clean sharp sand and lime. All joints and butting surfaces to be well payed with the hot composition before fixing, and in finished work the composition to be poured into interstices and joints. Any timber inaccessible for tarring when fixed to receive three coats before being placed in position.
274. No tar to be applied during or immediately after wet weather, or while surface of iron or timber is wet; and an interval of forty-eight hours to elapse between each application.

*Tar Varnish.*

- Interior surfaces of wrought-iron work.** 275. The whole of the interior surfaces (working parts and joints excepted) of the wrought-iron circular and oval tubes, cast-iron thimbles, expansion joint castings, short lengths of cast-iron circular and oval pipes, &c., after having been placed in position in the works, to be thoroughly cleansed of all scales, rust, and previous coating of linseed oil or paint, &c., and then to be coated twice with a tar varnish composed of 30 gal. of coal-tar, fresh, with all its naphtha retained, 6 lb. tallow, 1½ lb. resin, 3 lb. lamp-black, and 30 lb. freshly-slacked lime finely sifted; all materials to be approved of, and then to be intimately mixed as shall be directed, and applied hot, like paint.

*Day Labour.*

- Prices given in schedule.** 276. When "day labour" is required by the Superintending Officer to execute any works other than those for which a special price is given in the schedule of quantities and prices, the contractor shall provide the same at the several rates for "day labour" inserted in said schedule.
- To include.** The price for day labour is to include supervision as well as all tools, lighting, and implements of every kind necessary for carrying on the work, and shall be returned in the usual monthly progress certificate.
- Accounts to be sent in half-weekly.** 277. The accounts for this "day labour" shall, however, be rendered by contractor to the Superintending Officer in half-weekly intervals, that is to say, during the forenoon of every Monday and Thursday, failing this he shall lose all claim to payments for the "day labour" performed by him during the preceding three days.
- Length of day.** 278. The schedule rates per day are for the day of eight hours. In the event of overtime and night-work being ordered, it is to be paid for at 25 per cent. advance on the time rates set down for day-work.

*Measurements and Payments.*

- Contractor to be present.** 279. The contractor shall be present at all measurements, and, if required, assist in making the same. If he fail to attend after twenty-four hours' notice in writing has been delivered to him of the Superintending Officer's intention to take measurements, and clearly setting forth the locality of such intended operation, the measurements made by the Superintending Officer shall be binding on the contractor.
- When and how measurements are to be made.** 280. On satisfactory completion of any portion of the works, and at all other suitable times, the dimensions of such work shall be measured by the Superintending Officer, as specified, and recorded in a book kept for that purpose; and these quantities shall serve as the basis for arriving at the contract sum on completion of contract.
- Progress payments.** 281. For the purpose of making progress payments, the dimensions of still unfinished portions of the work will be measured in a summary way monthly, or as near as may be, but without prejudice to the ultimate acceptance or rejection of such unfinished portion of work.
- Contractor to sign measurement book.** 282. The contractor shall sign the measurement book each month, before the monthly progress payments are made, accepting the detailed quantities, prices, and amounts. Should he, however, disagree with the detailed quantities, prices, and amounts, he is at once to state in the measurement book in what particulars he disagrees, and the grounds of his disagreement; and unless this is done it is to be distinctly understood that the detailed quantities, prices, and amounts, as recorded in the measurement book, shall be binding.
- Final measurements.** 283. The final measurements, based upon the measurements made during the progress of the works, will be prepared within thirty days, or as nearly as may be after the completion of the work; and the contractor will be required to accept such measurement before the fixed deposit is returned.

*Junction with other Contracts.*

284. If two different contractors execute simultaneously two adjoining sections of the works, they shall be held jointly and severally responsible for effecting a proper junction of the sections.

*Suspension of Works.*

285. The contractor shall suspend the whole or any portion of the works, on receiving a written notice to that effect from the Engineer. He shall have no claim for loss or damage on this account, and such suspension shall in no wise vitiate the contract, but a commensurate extension of time for completing the works will be granted to the contractor, as set forth in clause 24 of the general conditions.

*Duties.*

286. In the event of any materials being imported by contractor for use on this contract, no refund will be made of any duties which may be legally chargeable on such materials; and the contractor shall bear and pay all duty stamps, licenses, building or surveyor's fees or other charges or fees whatsoever legally demanded by any municipal or other authorities.

*Testing the whole of the Works.*

287. It is to be distinctly understood that on completion of the works the Engineer shall have the power of ordering, and having the sewers, or portions of same, &c., closed in such order as he shall direct, and the whole of the sewers and aqueduct tubes, &c., filled with water for such a time as he may deem necessary for the purpose of testing the works; and any injuries, faults of whatsoever description, caused by or detected in consequence of such testing, to the work, shall be at once repaired, replaced by new work, and made good, the whole expense being borne solely by the contractor; and after the completion of these repairs, replacing with new works, and making good any damages, injuries, faults, &c., the whole of the works shall again be tested, as before described, until they shall be satisfactory to the Engineer.

This is the schedule to specification marked "C" referred to in our annexed agreement with Her Majesty the Queen, dated the 16th day of May, A.D. 1895.

Witness,—HAROLD F. NORRIE.

JOHN CARTER.  
FRANK MOOREHOUSE GUMMOW  
(By his Attorney, JOHN CARTER).  
D. G. SNODGRASS.

This is the schedule to specification marked "C" referred to in my annexed bond to Her Majesty the Queen, dated 16th day of May, A.D. 1895.

Witness,—HAROLD F. NORRIE.

JAMES GILLAN.

This is the schedule to specification marked "C" referred to in my annexed bond to Her Majesty the Queen, dated 16th day of May, A.D. 1895.

Witness,—HAROLD F. NORRIE.

GEO. FORREST.  
"D."

## "D."

## GENERAL CONDITIONS.

*Interpretation of Terms.*

1. WHENEVER the terms hereafter explained in the present clause occur in these or any special conditions, or in the contract or specification, they shall be held to mean, and shall mean, as follows:—

"Government" shall mean the Government of New South Wales promoting this undertaking.

"Minister" shall mean the Secretary for Public Works of the Colony of New South Wales for the time being.

"Engineer" shall mean the Engineer-in-Chief having the principal charge of the works, or the person acting as such for the time being.

"Superintending Officer" shall mean any person or persons who may from time to time be entrusted with the superintendence of the works on behalf of the Government.

"Contractor" shall mean the person or persons who contracted to execute the works.

"Special conditions" shall mean any "special conditions" hereto attached and forming part of the contract; and such special conditions shall be read with the general conditions as part and parcel of the contract.

"Schedule of prices" shall mean the rates at which the contractor has offered or agreed to execute the contract, where the same is based on a schedule of prices; and be the basis on which the value of any extra works or of any deductions shall be calculated, and progress payments made, whether the contract be one of a schedule of prices or a bulk sum.

"Plans" shall mean and include all drawings referring to the works and explanatory of, or supplementary to, the specification.

"Works" shall mean the works set out in the specification and plans, or, in the event of there being no plans, in the specification only.

"Net claim" shall mean the sum claimed by the contractor after deducting therefrom the sum acknowledged by the Department to be due.

"Net award" shall mean the sum awarded on arbitration, after deducting therefrom the sum acknowledged by the Department to be due.

*Supply of Labour, Materials, and Plant.*

2. The contractor shall, except in so far as the specification may expressly state to the contrary, provide at his own cost and expense all labour, materials, and plant, and everything which the Engineer may consider necessary for the proper and complete performance of this contract. No materials or plant placed on the site of the works shall be removed therefrom, or otherwise disposed of, without the consent of the Engineer.

*Plans, Specifications, &c.*

3. The plans and specifications represent generally the form, dimensions, and description of the several works. Where any discrepancy exists between the dimensions as indicated by the scale and those marked in figures, the figures are to be considered as correct, and are to be taken in all cases in preference to the measurements by scale. Or if there be any discrepancy between the figures or dimensions, or the form of construction, or the material as indicated in the plans; and the dimensions and materials given in the specification, the directions of the specification shall be adopted; and in all cases of defective description, or any ambiguity, the explanation given by the Engineer shall be binding upon the contractor. Also, anything contained in the plans, and not in the specification, or anything contained in the specification and not shown in the plans, shall be equally binding as if it were contained in both. If neither specification nor plans contain any mention of minor parts, which, in the opinion of the Engineer, are reasonably and obviously necessary for the satisfactory completion of the works, such parts are to be provided by the contractor without any extra charge, as if they were specially mentioned, and shall be deemed to be, and hereby are, included in this contract.

All works described in, or implied by, the specification or shown in any of the plans, or set forth in any lists or tables thereon, or attached thereto, as well as those expressly provided for, are to be made and executed in every detail conformably to the several plans already prepared or which may be prepared hereafter for the purpose of this contract, in strict accordance with the provisions of the specification and conditions, and to the entire satisfaction of the Engineer.

*Copies of Plans, &c.*

4. A copy of all plans and specifications required by the contractor for carrying on the works will be provided by the Government, but must be returned before a final certificate for the work can be given. Any additional copies which may be required and are supplied by the Department shall be paid for by the contractor at a rate to be fixed by the Engineer.

*Setting out Works.*

5. The works will be set out—that is to say, all necessary centre lines and levels will be given to the contractor—except in the case of buildings, when, in the absence of setting out, a block plan will be supplied, from which he must work; but the contractor must satisfy himself of the accuracy of the setting out, as no work incorrectly set out or improperly executed will be paid for.

*Protecting and Maintaining Signals and Marks.*

6. All bench marks, pegs, and signals on the surface, and all alignments, and level marks underground put in by the Engineer or Superintending Officer for the purpose of checking the contractor's work, will be confided to the care of the contractor. He shall, at his own expense, take all proper and reasonable precaution and care to preserve and maintain them in their true position; in the event, however, of their being disturbed or obliterated by accident or from any other cause whatever, they may, if necessary, be replaced by the Engineer or Superintending Officer at the contractor's expense, and the cost thereof deducted from any moneys then due or thereafter becoming due to the contractor.

*Possession of Ground.*

7. In giving the contractor possession of the site it shall not be deemed that he is to have the exclusive possession, but only a limited possession—that is to say, such possession as will enable him to perform the works comprised in this contract. The Minister may at any time take possession of any portion of the works or ground or intended site of the works for the purpose of carrying on any other works or for any purpose whatsoever. The contractor must procure for himself all other land which he may deem requisite for any temporary purposes, or for his own convenience.

*Access to Works.*

8. The Engineer, or any other person authorised by him, shall have free and uninterrupted access at all times to the works, and during working hours to any workshop or premises, not on the site of the works, where materials may be in preparation or stored for the purpose of this contract. The contractor shall give the Engineer all particulars as to the mode and place of manufacture of any of the materials proposed to be used in connection with this contract, and shall facilitate in every way the inspection of the same.

*Contractor's Risk.*

9. The contractor shall take upon himself the whole risk of executing the works to the satisfaction of the Engineer, and in accordance with the plans, sections, and specifications.

*Contractor to be represented.*

10. The contractor at all times during the progress of the works, when he is not personally superintending them, must have a responsible agent or overseer in charge to receive instructions from the Superintending Officer or Engineer, and to represent the contractor for all purposes of this contract.

Any notice or any written instructions to be given or delivered to the contractor under this contract shall be deemed to have been so given or delivered when given or delivered to the contractor or his representative at the work, or left at the contractor's usual or last-known place of abode or business.

*Order*

*Order of Procedure.*

11. The Engineer shall have full power to decide in what order in point of time the various parts of the work or works comprised under this contract shall be carried out.

*Power of Entry.*

12. The Engineer shall have the power, at his discretion, without vacating this contract, to enter upon, by himself or his agents, and make use of any part or parts of the work comprised under this contract, and his doing so shall in no wise be held as a waiver of the responsibility of the contractor in respect of this contract, except in so far as any injury may accrue to such work so entered upon, by reason of any proved carelessness, to the satisfaction of the Engineer, of any employee of the Government, in which event the contractor shall be free from liability on account thereof, but not otherwise.

*Instructions to be obeyed.*

13. Should the contractor refuse or neglect to carry out the instructions of the Engineer or the Superintending Officer, the Engineer shall have the power of suspending the usual monthly certificate until such instructions have been complied with.

*Power to dismiss men*

14. The Engineer may require the dismissal, within twenty-four hours, by the contractor, of any agent, overseer, foreman, workman, or other person employed on the works, and in the event of the contractor refusing or neglecting to comply with such requisitions, all further payments on account of the work may be stopped until such dismissal is effected.

*Bad Materials or Improper Works to be removed.*

15. The contractor shall be bound to remove, within twenty four hours, if written notice from the Engineer or Superintending Officer to that effect be given, any materials or work, whether fixed or not, which may appear to the Engineer to be of an inferior or improper description, and, in case of refusal, the Engineer shall have the power to get such materials or work removed at the contractor's expense, and to withhold all payments until such instructions have been complied with.

*Extra Works—Omissions of Works.*

16. If at any time whilst the works are in hand it shall be deemed expedient by the Engineer to order material or work of a different description to that specified, or to increase or diminish the dimensions or extent of any works to be done under this contract, or to alter their situation or vary the form or dimensions of any of the said works, or of any part thereof, or to make any deviation or to substitute one class of work for another, he shall have full power to do so, and to order and direct any such increase, diminution, alteration, deviation, or substitution, and the works involved in any such increase, alteration, deviation, or substitution, shall be executed by the contractor if of the class of works provided for in the schedule of prices, at such schedule prices; and no such increase, diminution, alteration, deviation, or substitution of works shall in any way annul or set aside this contract, or extend the time for the completion thereof, unless the Minister shall see fit to grant such extension; but such additions or alterations shall be measured and paid for, or deducted from the contractor's account, as the case may require, according to the schedule of prices. Provided that if any portion of the works so ordered to be done shall not be, in the opinion of the Engineer, of the same value or class of works provided for in the schedule of prices, the same shall be executed by the contractor at such prices as may be agreed upon with the Engineer; but if the contractor and Engineer cannot agree as to the price to be paid, the Engineer may order and direct the same to be done by such person or persons as he may think fit. Before any extra work, or work of an altered value or class, is undertaken by the contractor, it shall be imperative for him to procure an order in writing from the Engineer for carrying out such extra or variation of work, and the contractor shall not be entitled to any payment for such extras or variations unless he produce the written order for the same, as aforesaid, and he shall not be entitled to plead that the Engineer omitted to give such written order, as it is to be distinctly understood that the onus of obtaining such order shall be on the contractor. The contractor shall not be entitled to any other rate than the schedule rate on any plea that the work was in a different position, or of a different class from, or in a more difficult position than that shown on plan or specification, or carried out under circumstances not contemplated in the specification, unless an agreement entitling him to payment by other than the schedule rates shall have been previously made and signed by the Engineer and the contractor.

*Valuation of Omissions.*

17. The Engineer shall have the power to direct the omission of the carrying out of any part or parts of the said works, but not amounting to the omission of the whole; and the value of such work so omitted in such case, calculated at the schedule rates, or in the event of there being no schedule rates, calculated on the basis of the proportionate value which such work bears to the lump sum, as ascertained by the Engineer, whose decision on that point shall be final, shall be deducted from the contract sum, subject, however, to arbitration clauses Nos 36 to 41.

*Net Measurements.*

18. The whole of the work shall be executed and paid for according to the contract dimensions, and no allowance will be made for any excess of dimensions above those found on the working plans now exhibited, or which may be afterwards supplied, notwithstanding any general or local custom to the contrary, unless such excess has been expressly ordered. In the case of dressed masonry all cubic measurements will be taken at the extremes, and in the case of rock faced masonry all measurements will be taken to the draft. With regard to timber, all framed work will be paid to extremes, but in no case will scarfs in hewn or round logs be paid for.

*Contractor liable for injury to adjoining Lands, Properties, &c.*

19. The contractor shall not commit any act of trespass, and shall effectually protect all adjoining properties and owners thereof against any loss, damage, or injury that may occur through the carrying on of the works, whether to buildings, goods, property of any kind, or to persons; and in case any such trespass be committed, or any such loss, damage, or injury occur, the contractor shall make full compensation, and shall make good all or any such loss, damage, or injury; and if any such compensation for trespass, or any such loss, damage, or injury be recovered against the Government in the first instance, it may be deducted from any money due or coming due to the contractor under this contract, or may be recoverable from the contractor or his sureties as liquidated damages in that respect incurred.

*Damages, &c., to be paid for by the Contractor.*

20. All damage, injury, or loss that may happen to the works from any cause whatever during their progress must be made good by the contractor at his own expense; and the whole of the works must be delivered up complete in every respect, according to this contract, and the care and maintenance of all works under this contract shall remain with the contractor until the Engineer shall, by notice in writing under his hand, inform the contractor that he has taken charge thereof; and until such notice shall have been given, the contractor shall be responsible for all accidents, from whatever cause arising, and shall make good all damages thereto.

*Contractor not to Sublet Works or Assign Moneys.*

21. The contractor shall not assign or underlet this contract, or any part thereof, or assign or mortgage, charge or encumber all or any of the moneys payable or to become payable under this contract, or any other benefit whatsoever arising, or which may arise, under this contract, to any person without the consent in writing of the Minister being first obtained. The contractor for each and every breach of this condition shall be liable to pay to the Government the sum of £50 as and for liquidated damages; and the sum or sums payable as such damages may be deducted from any sum or sums due to the contractor under this or any other contract with the Government. And any permission to assign or underlet works to be done under this contract shall not discharge the contractor from any liability in respect of this contract, and shall extend only to the permission actually given, but not so as to prevent any proceedings for any subsequent breach of this condition; and all rights under these conditions shall remain in full force, and shall be available as against any such subsequent breach.

*Truck System not allowed.*

22. The workmen and labourers of every class employed on the works shall be paid their wages in full, in money, current coin of the Colony, at least once in every month, and no ticket or other system of payment by provisions, liquors, or goods will on any pretence be allowed; nor shall the contractor, or any person or persons employed by him, or in any way connected with him, establish any shop for the supply of provisions, liquors, or goods; nor shall the contractor oblige his workmen to take provisions, liquors, or goods of any kind from any person in particular. The workmen and labourers of every class shall be paid on the works if it be possible, or in some building in the vicinity; and in no case shall they be paid at a public-house or other place where liquors or refreshments are sold. The contractor, for each and every breach of this condition, shall pay to the Government the sum of £50 as and for liquidated damages; and the sum or sums payable as such damages may be deducted from any sum or sums due to the contractor under this or any other contract with the Government.

*Power of the Government to pay Workmen and Tradesmen.*

23. Before the payment of any money to the contractor, the Engineer may require from him a statutory declaration that the tradesmen supplying materials for or incidental to the works, and the workmen and labourers of every class employed on the works, have been paid their claims of every kind in full, in current coin of the Colony, and to the latest date at which such wages or claims are due; and the Engineer may withhold the payment of any money that may be due or become due to the contractor until such declaration has been made and delivered to him.

If the contractor shall fail or omit to pay the claims of any such tradesmen, workmen, or labourers, in the current coin of the Colony, it shall be lawful for the Minister or the Engineer, as often as the same shall happen, upon complaint of such failure or omission made by any such tradesman, workman, or labourer, and upon proof to the satisfaction of the Minister or Engineer of such failure or omission to pay the amount of such claim to such tradesman, workman, or labourer, and to deduct the same amount from any money then due or owing, or thereafter to become due or owing, to the contractor under this contract.

*Delay by Minister.*

24. If the contractor shall not be able to obtain possession of any portion of the ground required for the execution of the works to be done in connection with this contract, or if from the non-delivery, or any delay in the delivery to the contractor, of any materials which under this contract the Minister is to supply, or from any cause whatever arising out of the acts or defaults of the Minister, or any officers or servants in his employment, or from any accident happening to the said works during their progress not arising from the neglect or default of the contractor or his servants or workmen, the contractor shall be delayed or impeded in the execution of his contract, the contractor may from time to time within seven days of the happening or occurring of such act, default, or accident, apply in writing to the Engineer for an extension of time on account of such act, default, or accident, setting forth the cause of such application, and the Engineer shall, if the Minister think the cause sufficient, but not otherwise, allow by writing under his hand such an extension of time as the Minister shall think adequate; and the penalties, sets-off, and deductions to which under this contract the contractor is liable shall not attach until the expiration of such extension of time, but shall attach, and the contractor shall become liable to the same from the date of the expiration of such extended time or times. And unless the contractor shall make such application within the time and in the manner aforesaid, and unless and until the Minister shall allow such extension or extensions of time as aforesaid, the contractor shall not by reason of any delay arising from the cause or causes aforesaid, or any of them, be relieved in any way or to any extent of his liability to finish and complete the works within the time in this contract specified; and in default of his so doing, to pay and be subject to the liquidated damages, deductions, and sets-off as in these conditions provided; nor shall the Minister be deprived in any way or to any extent of his right to deduct or recover any sum or sums as liquidated damages, and not as or in the nature of a penalty or to make deductions or sets-off which under this contract he is entitled to make, deduct, set-off, or receive from the contractor for or by reason or on account of any delay in the completion of the work or any portion of the same, nor shall the rights, powers, and authorities by these conditions given to or vested in him be in any way affected.

*Patent Rights to be included.*

25. The contractor is to include in his tender the amount of all patent rights and royalties which may be claimed by any patentee or patentees for the manufacture and use of any portion of this work, and must undertake to liquidate the same when required to do so.

*Free Passes, &c.*

26. No free passes on any of the Government railways will be granted either to the contractor or his agents, nor will any materials or articles of any description be conveyed free of charge.

*Conditions not to be Waived.*

27. None of the conditions of this contract shall be varied, waived, and discharged, or released, either at law or in equity, unless by the express consent of the Minister, testified in writing under his hand.

*Progress Payments without Prejudice.*

28. No progress payment given to the contractor shall prevent the Engineer from at any future time before the final settlement rejecting all unsound materials and improper workmanship discovered subsequently to the giving of any previous payment; and notwithstanding any approval given or made by the Superintending Officer that portions or the whole of the works have been satisfactorily performed, the Engineer may require the contractor to remove or amend at any future time previously to the final payment on account of the work, any work that may be found not in accordance with this contract; and the contractor must remove and amend at his own cost all such work when so required; and if he refuse or neglect to do so, the Engineer shall have the power to carry out such work, and to deduct the whole cost thereof from any moneys that may be due, or that may become due, to the contractor.

If, in the opinion of the Engineer, further inquiry is necessary or desirable before any progress payment is made, he shall have the power to withhold the certificate on which such payment would have been made, for any period which he may consider necessary for the purpose of such inquiry.

*Security.*

29. Within fourteen days after the notice of the acceptance of his tender shall have been given to the contractor, or posted to the address of his last-known place of business or residence, he shall deposit with the Minister, or at the option of the Minister, in some bank or banks in Sydney, upon fixed deposit in the name of the Minister, a sum calculated at the rate of £5 for every £100 or part thereof on the amount of his tender up to the sum of £100,000, and at the rate of £1 for every £100 or part thereof in addition, for any amount over that sum, to be held by the Minister as security for the due and proper performance and completion of this contract until the Engineer has certified that the whole of the work in the said contract has been completed to his satisfaction, or until this contract has been cancelled by the Minister under the power given to him in that respect under clause 32 of these conditions, in which last-mentioned event happening the money so deposited shall become forfeited to the Crown, and shall be held by the Colonial Treasurer, for and on behalf of Her Majesty the Queen, as liquidated damages. If, however, this contract shall not have been cancelled under the said clause, and if the works comprised in this contract are not completed within the time mentioned in clause 34 of these conditions, the liquidated damages which under the last-mentioned clause are made payable to the Minister may be deducted and taken from the money so deposited.

If the contractor fail to deposit the sum as hereinbefore provided within fourteen days from the acceptance of the tender, or if he fail to execute the contract for the due performance of the works mentioned in the said tender, the Minister shall have the option of and full power and authority to declare such acceptance to be annulled, in which case the amount of the preliminary deposit will be absolutely forfeited to the Crown, as provided by the Regulations of the Tender Board.

No tenderer will be authorised to proceed with the work tendered for until he has made the deposit as aforesaid, and has executed the required contract for the due performance of the said works, it being hereby declared that for all or any work done or materials found and provided by the contractor before the due execution of the said contract, or the said moneys being deposited as aforesaid, he shall not have any right of action, claim, or demand against the Minister.

The



The contractor will be entitled to receive any interest that may be payable upon the fixed deposit of the money, if the money be placed in a bank at fixed deposit, as such interest becomes payable; but it is expressly declared that the Minister is not to be held liable or answerable in any way for any loss on the money so deposited, or for any loss of interest from the fixed deposit not being renewed.

*Payments.*

30. Progress payments may be made once in every month, unless the same shall become not payable by reason of anything contained in these conditions, on the certificate of the Engineer, as the work proceeds, in the proportion of 80 per cent. of the value of the work returned, until the sum retained reaches the amount of the deposit provided for in the preceding clause, when no further deductions will be made. The amount of the retention money will be held by the Minister, in addition to the cash security, unless otherwise provided for in the specification, until the Engineer has certified that the whole of the works have been satisfactorily completed, and the period specified for the maintenance of the said works has expired, and all accounts finally adjusted, when the retention money, in addition to the cash security, will be paid to the contractor; and it is expressly declared that until a certificate has been given by the Engineer to the Minister that the work done by the contractor has been executed and completed to his satisfaction, the contractor shall have no right or claim in respect of any work done or materials provided, nor to the payments from time to time to be made under this contract, or to the final payment upon the whole of the works being finished.

*Delay or Bad Work, Bankruptcy, &c.*

31. In case the Engineer shall be at any time dissatisfied with the mode of proceeding, or at the rate of progress of the works or any part thereof, or in case the contractor shall at any time neglect or omit to carry out the instructions of the Engineer, or to dismiss any person employed when required, or shall neglect or omit to remove any materials or work which he is required to remove under condition 15, or in case the contractor shall assign or underlet this contract, or any part thereof, or assign or mortgage, charge or encumber, or attempt to assign, mortgage, charge or encumber, all or any of the moneys payable or to become payable under this contract, or any other benefit whatsoever arising or which may arise under this contract, without the consent in writing of the Minister being first obtained, or in case the contractor shall make default in insuring and keeping insured, in cases where insurance is specified, and depositing the policies and receipts for premiums in accordance with these conditions, or in case the contractor shall become bankrupt, or shall make an assignment of his estate for the benefit of creditors, or shall make an arrangement or composition with his creditors, then and in every such case the Minister shall be at liberty, without vitiating this contract, and without prejudice to any right that may have accrued to liquidated damages under any of these conditions, to take the works wholly or partially out of the hands of the contractor, and to employ or contract with any other person or persons to execute the same, and for that purpose to take possession of and use all horses, materials, plant, tools, implements and things on, or about the said works, without making any allowances for the same, and all damages and expenses thereby incurred shall be ascertained and certified by the Engineer, and, together with any sum payable as liquidated damages under these conditions, shall be deducted from any money that may be then due, or may thereafter become due to the contractor, or may have been deposited by him; and if the money then due, or thereafter becoming due, to the contractor, or deposited by him, be not sufficient for that purpose, the balance remaining unpaid shall be a debt due by the contractor to the Minister, and may be recovered accordingly.

*Cancellation of Contract.*

32. In any or either of the events mentioned in the last preceding clause of these conditions, the Minister shall have the option and full power and authority in lieu of proceeding under such clause, and without prejudice to any right that may have accrued to liquidated damages under any of these conditions, to cancel this contract, whether there are any works remaining to be done or not; and in such case the moneys which shall have been previously paid to the contractor on account of the works executed shall be taken by him as full payment for all works done under this contract; and upon notice in writing under the hand of the Minister that he, under the authority of this condition, cancels this contract, being given to the contractor, this contract shall be cancelled, and thereupon all sums of money that may be due to the contractor, or unpaid, together with all implements in his possession, and all materials provided by him, upon the ground upon which the work is being carried on, or adjacent thereto, shall be forfeited, and all sums of money held as security or named as liquidated damages for the non-fulfilment of this contract, within the time specified, shall also be forfeited and become payable to the Government, and the said implements and materials shall become and be the absolute property of the Government, and with the moneys so forfeited and payable as aforesaid shall be considered as ascertained damages for breach of contract.

*Insurance.*

33. The contractor shall from time to time, when required to do so by the terms of the specification, insure the works against loss or damage by fire, in an office to be approved, in the name of the Minister, for the amount of the full value of the work completed, as determined by the Engineer, and shall lodge with the Engineer the policies and receipts for the premiums for such insurance, and shall continue such policies until possession is given up by the Government; in default of which the Minister shall be at liberty to insure and deduct the amount of the premiums paid from any moneys payable to the contractor, and may refuse payment of any certificate until such policies and receipts are handed in as aforesaid; but this insurance is to be no limit or bar to the liability and obligation of the contractor to deliver up the works to the Minister completed in all respects according to the contract. In case of loss or damage by fire the moneys payable under any such insurance shall be received and retained by the Minister until the works are finally completed, and shall then be credited to the contractor in the final settlement of accounts in the event of the contract not having been previously cancelled under these conditions.

*Time of Completion, &c.*

34. The contractor shall complete the whole of the works comprised in this contract within seventy-eight weeks from the date of the acceptance of his tender, and in the event of their non-completion at the specified times, should the Engineer not have proceeded under clauses Nos. 31 and 32 of these conditions, or either of them, the contractor shall pay, by way of liquidated damages, and not as or in the nature of a penalty, the sum of \_\_\_\_\_ pounds sterling for every week, or for every part of a week, that shall elapse after such specified time, until their completion, and which sum or sums may be deducted from any money payable to the contractor under this or any other contract. The contractor shall have no right to a certificate for payment after the date specified in these conditions for the completion of this contract until the whole of the works shall have been properly completed to the satisfaction of the Engineer, unless the time for the completion of this contract shall have been extended by the Minister, in which case such extended time shall become the time for the completion of this contract, and it is to be expressly understood that the fact of the time having been so extended shall not in any way be taken as a waiver of this contract, or as annulling or setting aside this contract in any respect, nor be taken as releasing the contractor from any of the responsibilities or obligations of this contract, which, in all other respects, shall remain the same as if the time had not been extended.

The like liability also shall hold good as to the obligation of the contractor in the event of any advance being made to him from the retention money, or on material on the ground and not *in situ*.

*Maintenance.*

35. The contractor will be bound to maintain the works for a period of three months after their final completion and use by the Government; and if any part should within that period show signs of weakness, or of giving way, or if any defective workmanship or materials be detected, the contractor, when called upon to do so, shall make good the same at his own expense, to the satisfaction of the Engineer, before any moneys held by the Government on account of this contract will be paid. It is also to be distinctly understood that the Government shall have the full, free, and unrestricted use of the said works, without any interference whatever on the part of the contractor during the currency of this period of maintenance; and such use of the said works on the part of the Government shall not be held as relieving the contractor of any liabilities or obligations whatever in respect of his contract.

*Arbitration.*

36. The following matters shall be decided by the Engineer, whose decision shall be absolute and final:—(1) All questions or disputes which shall arise respecting the true construction or meaning of the plans or specification, or the quality of the workmanship, or quantity or quality of materials necessary for the whole or any part of the contract. (2) All questions and disputes when the net claim shall not amount to the sum of £500.



37. All questions and disputes not hereinbefore provided for shall, if the net claim be £500 or upwards, upon the completion of the works under the said contract, and before payment of the retention money and the money deposited as security for the due carrying out of the contract, be fixed and determined by arbitration as hereinafter provided.

38. If either party consider that he has claims in respect of any matter in which arbitration may be claimed, he shall, within one month of the date of the final certificate, furnish to the other party full particulars in writing of such claims, breaches, doubts, disputes, and differences in respect of which he desires arbitration, giving distinct and separate items, and the amount, if any, claimed under each item; and the other party may thereupon furnish particulars of all claims he has in respect of such matters, irrespective of the aggregate amount of such claims; and the party furnishing the same shall be bound by such particulars; and no claim not included in such statement shall be taken into consideration at such arbitration, or become subject of arbitration or action; and the claim or respective claims so made as aforesaid shall be determined by arbitration, in the manner as hereinafter provided.

39. If both parties concur in the appointment of a single arbitrator, then the reference shall be to such single arbitrator; but if the parties for twenty-one days after the particulars first mentioned in the last preceding clause shall have been furnished, cannot concur in the appointment of a single arbitrator, the reference shall be to two arbitrators, one to be appointed by each party, or their umpire to be appointed in writing by such arbitrators before they commence the business of the reference; and the arbitration shall, subject to the express provisions herein contained, be made and held pursuant and subject to the Arbitration Act of 1892, or any statutory modification or re-enactment thereof for the time being in force.

40. The costs of and incidental to the arbitration shall be paid or borne by or between the parties in manner herein after mentioned, that is to say:—

1. If the sum awarded does not exceed the amount acknowledged by the Department to be due, the contractor shall pay all the costs of and incidental to the arbitration.
2. If the sum awarded shall amount to the sum claimed by the contractor, the Government shall pay all the costs of and incidental to the arbitration.
3. If the sum awarded exceeds the amount acknowledged by the Department to be due, but is less than the sum claimed by the contractor, the costs of both parties shall be added together and the total cost so ascertained shall be paid by the parties in the proportions following, namely:—The Government shall pay such sum as bears the same proportion to the total cost as the net award bears to the net claim, and the balance shall be paid by the contractor.

The award shall direct to, and by whom, and in what proportions the costs shall be paid, in accordance with the provisions hereinbefore contained; but the award need not specify the amount of such costs. Such amount shall, in the event of disagreement, be taxed or settled by the arbitrators or umpire, as between party and party, after the award is made. No costs shall be allowed as between solicitor and client. If either party shall be dissatisfied with the costs allowed by the arbitrators or umpire, the same may be taxed by the Prothonotary or other proper officer of the Supreme Court.

41. It is to be distinctly understood that all claims by either party to have any of the matters which may be submitted to arbitration so dealt with, must be made upon the whole of the work being completed, and before payment to the contractor of the retention money, or of the money deposited as security for the due performance of the contract, and that the acceptance by the contractor of payment of the retention money in cases where a bond to secure the completion of the works has been given, and in other cases of the retention money, or of any balance thereof, and of the money deposited as security for the due performance of the contract, shall be conclusive proof that the contractor has no such claim or claims.

Roads and Bridges and Sewerage Branch,  
Department of Public Works.

ROBT. HICKSON,  
Commissioner and Engineer-in-Chief,  
Roads, Bridges, and Sewerage.

These are the general conditions marked "D" referred to in our annexed agreement with Her Majesty the Queen, dated the 16th day of May, A.D. 1895.

Witness,—HAROLD F. NORRIE.

JOHN CARTER,  
FRANK MOORHOUSE GUMMOW,  
(By his Attorney—JOHN CARTER).  
D. G. SNODGRASS.

These are the general conditions marked "D" referred to in my annexed bond to Her Majesty the Queen, dated the 16th day of May, A.D. 1895.

Witness,—HAROLD F. NORRIE.

JAMES GILLAN.

These are the general conditions marked "D" referred to in my annexed bond to Her Majesty the Queen, dated the 16th day of May, A.D. 1895.

Witness,—HAROLD F. NORRIE.

GEO. FORREST.

"E."

SPECIAL CONDITIONS.

*Rates of Wages to be Paid.*

NOT less than the several rates of wages as set out in the schedule herein shall be paid by the contractor (or—in the event of the Minister approving of the subletting of any portion or portions of the works—by the subcontractor) for the various services to be performed under this contract, and in case of dispute as to the classification of workmen, the decision of the Engineer shall be final; the rates, however, do not include those to be paid to apprentices or boys.

With respect to overtime, the recognised rules of the particular trade then prevailing in the district where the work is situated shall be observed.

If it shall at any time be proved to the satisfaction of the Minister that the contractor or any approved subcontractor is paying or has paid a lesser rate of wage for services rendered during the progress of the works to any workman employed thereon than is set out in the following schedule, the Minister shall have the option and full power and authority to cancel the contract, as if such breach was and is one of the events mentioned in clause 32 of the general conditions. Any permission to sublet shall not discharge the contractor from any liability in respect of the rate of wages to be paid under this contract.

In all classes of labour forty-eight hours shall be considered as a week's work. This rule, however, shall not apply to those workman, the necessities of whose employment demand that longer hours shall be worked, as in the case of firemen, who usually have to get up steam in readiness for the day's work. The necessity for longer hours of labour in special cases shall be determined by the Engineer, whose decision shall be final.

The following is the schedule referred to:—

| Trade.   | Rate.        |
|--|--------------|
|  | s. d.        |
| Carpenters .....                                 | 8 0 per day. |
| Masons .....                                     | 10 0 "       |
| Bricklayers .....                                | 9 0 "        |
| Plasterers .....                                 | 9 0 "        |
| Blacksmiths .....                                | 8 6 "        |
| Boilermakers and riveters .....                  | 9 0 "        |
| Fitters .....                                    | 9 0 "        |
| Painters .....                                   | 7 6 "        |
| Plumbers .....                                   | 8 6 "        |
| Shipwrights .....                                | 9 6 "        |
| Copper and brass workers .....                   | 9 0 "        |
| Moulders .....                                   | 7 0 "        |
| Engine drivers .....                             | 7 6 "        |
| Workmen not included in the foregoing list ..... | 6 0 "        |

These are the special conditions marked "E" referred to in our annexed agreement with Her Majesty the Queen, dated the 16th day of May, A.D., 1895.

Witness,—HAROLD F. NORRIE.

JOHN CARTER.  
FRANK MOOREHOUSE GUMMOW  
(By his Attorney—JOHN CARTER).  
D. G. SNODGRASS.

These are the special conditions marked "E" referred to in my annexed bond to Her Majesty the Queen, dated 16th May, A.D., 1895.

Witness,—HAROLD F. NORRIE.

JAMES GILLAN.

These are the special conditions marked "E" referred to in my annexed bond to Her Majesty the Queen, dated 16th day of May, A.D., 1895.

Witness,—HAROLD F. NORRIE.

GEO. FORREST.

"F."

Department of Public Works, Roads, Bridges, and Sewerage Branch.

TENDER FORM.

IN pursuance of advertisement in the *Government Gazette*, we the undersigned, do hereby tender to provide the material and perform the various works required in about the full and proper construction, erection, and completion of the Northern Main Sewer, Leichhardt and Amundale section (Contract No. 77), agreeably to the plans, specification, schedule to specification, special condition, and general conditions, which have been inspected and lodged by us for the sum of £15,500, and to complete the same within eighteen months from the date of the acceptance of this tender; and we hereby undertake that we will, within fourteen days from the date of notification of the acceptance of the said tender, execute and deliver to the Minister for Public Works, a valid legal contract with Her Majesty the Queen, embodying the terms and conditions above mentioned, and to provide the security required by clause 29 of the said general conditions; and we enclose herewith our cheque for the sum of £160 as a preliminary deposit; and we agree that such sum shall be absolutely forfeited if we at any time within thirty days after the said tender is opened withdraw same, or if, in the event of this tender being accepted, we fail to complete the abovementioned contract within fourteen days thereafter; and further, that this tender is made subject to the conditions contained in the Tender Board Regulations, printed on the back hereof, and by which we agree to be bound.

Dated this 13th day of March, 1895.

CARTER, GUMMOW, & CO.,  
Box No. 10, North Sydney.

Witness,—A. R. BURKITT.

TENDER BOARD REGULATIONS.

No Tender shall be received after eleven a.m. on the day named for the receipt of such Tender unless there are circumstances which, in the opinion of the Member, of the Board then sitting, render it desirable to do so.

It shall be the duty of the President, Vice-President, or the senior member present, as the case may be, as soon as the Tenders shall have been opened and the necessary particulars ascertained, to publicly announce the number of Tenders received for each work and the name of the lowest Tenderer; but no Tender shall be accepted until the head of the branch, under whose directions the work is to be carried out, has reported upon the whole of the Tenders received.

The Secretary shall, as soon as practicable after the Board has adjourned, exhibit in a conspicuous position, in the Public Works Office, a full statement of the Tenders received, showing the work, the name of the Tenderer, and the amount of each Tender.

All envelopes containing Tenders must be addressed to the President of the Board, and have legibly endorsed upon them the name of the work for which the Tender is submitted.

Every Tender must, as a guarantee of good faith, be accompanied by a preliminary deposit, calculated according to the following scale, viz. :—

|   |         |
|---|---------|
| For amounts up to £500 inclusive...                 | £5 0 0  |
| For amounts exceeding £500 and not exceeding £1,000 | £10 0 0 |

For all sums over £1,000 one per cent. on the amount of Tender up to a maximum deposit of £500. Such deposit to be in the form of a cheque in favour of the President of the Board, endorsed by the Manager of the Bank upon which it is drawn, or a bank draft.

All deposits, with the exception of that of the successful Tenderer, shall be returned by the Secretary to the person entitled thereto, as soon as possible after the Board shall have adjourned, and the deposit made by the successful Tenderer shall be returned to him on his executing the bond for the fulfilment of the Contract. When the Contract is for a less sum than £200 the deposit with Tender shall not be returnable until the service is satisfactorily completed.

Any Tender which may be received without such preliminary deposit shall, unless otherwise directed by the Board, be deemed to be informal, and rejected accordingly.

In the event of any Tenderer failing to take up his Tender, complete the bond, and proceed with the Contract, within the time specified, or withdrawing his Tender after it shall have been opened, whether such Tender shall have been accepted or not, all moneys deposited by him on account thereof or in connection therewith, shall be forfeited to the Crown, and in such case be paid to the credit of the Consolidated Revenue of the Colony.

Whenever a Tenderer shall fail to proceed with a Contract as aforesaid, fresh Tenders shall be invited at short notice for the work, unless in the opinion of the President there are circumstances which make it desirable for another Tender in the same series to be accepted; but the Tenderer by whose default such a course has been rendered necessary shall be excluded from the competition, and from any competition for other works, at the pleasure of the President.

In submitting a Tender, the full Christian name of the Tenderer must be given, or when the offer is in the name of a firm, the names in full of each member. When bondsmen are required, the names in full, occupations, and addresses must be stated in the Tender. The omission of this information will render the Tender liable to be declared informal.

The Board shall not be bound to accept the lowest or any Tender.

The Board-room shall be open for the admission of the public while the Tenders are being opened and declared.

This is the tender marked "F" referred to in the annexed agreement with Her Majesty the Queen, dated the 16th day of May, A.D., 1895.

Witness,—HAROLD F. NORRIE.

JOHN CARTER.  
FRANK MOOREHOUSE GUMMOW  
(By his Attorney—JOHN CARTER).  
D. G. SNODGRASS.

This is the tender marked "F," referred to in my annexed bond to Her Majesty the Queen, dated 16th day of May, A.D., 1895.

Witness,—HAROLD F. NORRIE.

JAMES GILLAN.

This is the tender marked "F," referred to in my annexed bond to Her Majesty the Queen, dated 16th day of May, A.D., 1895.

Witness,—HAROLD F. NORRIE.

GEO. FORREST.

The plans herein referred to are those exhibited by the Department (with the exception of aqueduct plans), together with plans on our patent system lodged with Public Works Department.

"G."

## "G."

## SUPPLEMENTARY SPECIFICATION.

THE structure above the level of the skewbacks of main arches to be constructed as shown on drawing which accompanies the contractor's tender of cement mortar (except the cement facing), composed of one part of cement to three parts of sand, and wrought-iron rods on the "Monier system."

The foundations of piers are to be in conformity with the drawings attached to the contract, except as regards to the extra size necessitated by the larger pier shown on the contractor's plan, and are to be to the satisfaction of the Engineer.

Should the piers be required to be put down to a greater depth than shown on the drawings, or a greater number of them require piling than shown, the work is to be executed as ordered without extra payment being made.

The piers are to be built with sandstone concrete of the quality specified, and faced with cement mortar composed of one part of cement and two parts of sand.

The cement facing of the structure, above the level of the springing of main arches, is to be composed of one part of cement and one part of sand.

The works generally are to be carried out in accordance with the specification, schedule to specification, and the plans therein referred to, save and except such structural parts as are to be carried out under the "Monier system," or necessarily enlarged to meet the requirements of the contractor's plan, and within the time set out in the general conditions.

The contractors shall continue to maintain the said works at their own cost after the period of maintenance set forth in the general conditions, for a further period of three years, computed from such date, to the satisfaction of the Engineer, whose decision shall be final and conclusive upon all points concerning workmanship and materials, and the permanency and durability of the said works, and the contractors shall enter into a bond to Her Majesty the Queen in the penal sum of £12,000, and find two sufficient sureties to enter into separate bonds in the penal sum of £6,000 each, to secure the removal of so much of the said works as shall have been constructed on the "Monier system," if the Engineer shall be dissatisfied with the same at any time during the said periods of maintenance, and to re-erect and construct the said works at their own cost and expense in accordance with all things with the specification, schedule to specification, and plans therein referred to, within thirty-nine weeks from the date of being called upon so to do.

This is the supplementary specification marked "G" referred to in our annexed agreement with Her Majesty the Queen, dated the            day of            A.D. 1895.

JOHN CARTER.  
FRANK MOOREHOUSE GUMMOW  
(By his Attorney, JOHN CARTER).  
D. G. SNODGRASS.

This is the supplementary specification marked "G" referred to in my annexed bond to Her Majesty the Queen, dated the 16th day of May, 1895.

Witness,—HAROLD F. NORRIE.

JAMES GILLAN.

This is the supplementary specification marked "G" referred to in my annexed bond to Her Majesty the Queen, dated the 16th day of May, A.D. 1895.

Witness,—HAROLD F. NORRIE.

GEO. FORREST.

## Appendix No. 2.

## "H."

THIS is the Schedule of Quantities and Prices hereinbefore referred to.

| No. of Item. | Description of Work.  | Unit.                            | Probable Quantity. | Rate per Unit.   |
|--------------|---|----------------------------------|--------------------|------------------|
| 1            | Excavation in opening cutting, as specified in Clause No. 3 .....   | Cubic yards .....                | 800                | £ s. d.<br>0 1 0 |
| 2            | Refilling and embankment, as specified in Clause No. 4 .....  | " .....                          | 1,400              | 0 0 6            |
| 3            | Rubble stone filling, as specified in Clause No. 4, hand-packed where ordered.  | " .....                          | 150                | 0 3 6            |
| 4            | Sandstone road ballast, 4-inch gauge, spread 9 inches thick, as specified in Clause No. 4.                                      | " .....                          | 200                | 0 4 0            |
| 5            | Concrete work, as specified in Clause No. 9 .....   | " .....                          | 391                | 1 6 0            |
| 6            | Cement facing, as specified in Clause No. 10 .....  | Square yards .....               | 1,025              | 0 2 3            |
| 7            | Brickwork, as specified in Clause No. 11 .....  | Cubic yards .....                | 3                  | 2 5 0            |
| 8            | Supplying and fixing in position rolled iron girders, as specified in Clause No. 12.  | Ton.—J.C.<br>Cwt.—F.M.G.<br>G.C. | 9.1                | 8 0 0            |
| 9            | Fascine work, as specified in clause No. 13 .....   | Cubic yards .....                | 70                 | 0 3 0            |
|              | Supplying and fixing in position glazed stoneware pipes, including providing and fixing discs, as specified in Clause No. 14 :— |                                  |                    |                  |
| 10           | 18 inches internal diameter .....   | Lineal foot .....                | 10                 | 0 4 0            |
| 11           | 9 " " " .....   | " .....                          | 10                 | 0 1 0            |
| 12           | 6 " " " .....   | " .....                          | 10                 | 0 0 6            |

If tenderers are not desirous of abiding by the prices fixed, they must quote only one rate of percentage above or below all prices in the schedule, and not one rate of percentage upon certain items and another rate or rates upon others.

The quantities are approximate, and are merely for the guidance of tenderers, and are subject to omissions, deductions, alterations, and additions.

The prices in the schedule are for each kind of work in place, complete, as specified.

They also include continual maintenance of the works during the whole time of construction and up to the day of their being formally taken over by the Engineer.

G.C. NOTE.—Item No. 8 should be read as "ton" and not "cwt."

Witness,—GEO. CHAPMAN.

JOHN CARTER,  
F. M. GUMMOW.

This is the schedule of quantities and prices marked "H" referred to in our annexed agreement with Her Majesty the Queen, dated the 7th day of May, A.D. 1896.

Witness,—GEO. CHAPMAN.

JOHN CARTER,  
F. M. GUMMOW.

## Appendix No. 3.

95-283—Sewerage.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 29 July, 1895.

W. Schill v. Carter, Gummow, &amp; Co. ; A. Schill v. Carter, Gummow, &amp; Co.

Amount paid verdict to plaintiffs' cost of actions.

Engineer-in-Chief for Public Works,—

THESE actions were brought to recover compensation for damage to the plaintiff's houses which, it was alleged, had been caused by blasting on the sewerage Contract No. 69.

The cases were tried in the District Court, and whilst the officers of the Department who gave evidence considered that no damage had been sustained by the plaintiffs, the jury thought otherwise, and assessed the damage in the case of W. Schill to be £20, and in that of A. Schill £30.

The costs in the actions, it appears, amounted to £146 17s. 4d.

In September, 1892, the question of liability in connection with such cases as those under consideration was referred to the Crown Solicitor for his advice, and he replied as follows:—

“ No. 92/663—92/2165.

92/2385, 29/10.

“ Sir,

Crown Solicitor's Office, Sydney, 26 October, 1892.

“ I have the honor to return herewith the minute of the Engineer-in-Chief of the Sewerage Branch relating to the liability of the Department for damaged property caused by blasting in sewer tunnels, sent to me for advice on two questions submitted.

“ It is stated that claims are frequently made on the Department for damage done to houses owing to blasting operations carried out by sewerage contractors, and that hitherto the Department has been able, acting under clause 11 of the General Conditions, to transfer the liability to the contractors.

“ It is understood that one of the contractors has recently been advised by his solicitor that the Department is liable, on what grounds is not known.

“ I am now asked to advise:—

“ 1. Whether the contractor who carries out the work as specified, as regards size of charges, is liable.

“ 2. Whether an action lies against the contractor or the Department.

“ The questions involved in the consideration of this matter have frequently come before Courts in England, and the result of these cases, and the general principles on which they go, have been stated by a learned judge in a Scotch case, which is accepted as a correct interpretation of the law. He says as follows:—

“ On carefully considering the very numerous cases on this branch of the law, and of which we have had in the argument a very full citation, I think that the principle which governs the decision in such cases is that the principal or superior, be he called either master or employer, who has reserved or who has assumed the *direct and personal control* over the subordinate, be he called servant or workman, who committed the fault or negligence, is liable for the damage thereby caused. In such case ‘*Respondeat Superior*’—the superior is answerable for the negligence of his subordinate: and the test always is, I think—had the superior personal control or power over the acting or mode of acting of the subordinate? I use the expression ‘*personal control*’ because I think that this is always the turning-point in such cases. Was there a control or direction of the person in opposition to a mere right to object to the quality or description of the work done? Where this element of personal control is found, then responsibility, either for malfeasance or nonfeasance, for fault or negligence, will attach, not only to the servant or workman (he is always liable), but to him who has the personal control over him who was his superior in the sense of the maxim. On the other hand, if an employer has no such personal control, but has merely the right to reject work that is ill-done, or to stop work that is not being rightly done, but has no power over the person or time of the workman or artisan employed, then will he not be their superior in the sense of the maxim, and not answerable for their fault or negligence.

“ From this it will be seen that the test of who is liable, the contractor or the employer, is which retained the power of controlling the work. If this power of control is retained by the employer, it would seem that he is liable as well as the contractor for any damage that may be done in carrying out the work.

“ Turning to the General Conditions used in this case, I find in clause No. 14, under the head of explosives, the following condition:—‘The use by the contractor on the work of blasting powder or any other explosive material shall be confined strictly to the limit which shall be set by an *order in writing* of the Engineer as to the locality, time, quantity, particular kind of material, and precautions to be taken during its use.’

“ Under this clause it is quite clear that the Department, through its Engineer, exercises a complete ‘*personal control or power*’ over the use of these explosives, and, on the principle above stated, I think the Department would be liable for any damage that might be caused. On turning to clause 11, referred to in the minute of the Engineer-in-Chief, it will be seen that it is provided as follows:—

“ During the whole time of construction of the work, and during the period of their maintenance, the contractor shall be liable for any accident, damage, or injury, whatsoever, to the public or to any individual which may be caused by his operations or his neglect.’

“ Under this clause, I think that as between the Department and the contractor, the damage caused by the operations must be paid by the contractor, but this does not affect the liability of the Department to the person injured.

“ I have, therefore, the honor to advise as follows:—

“ 1. The contractor who carried out the work, as specified, as regards size of charges, is liable to an action for damage caused by his operations, although he may have received the directions in writing of the Engineer under clause 14.

“ 2. An action would, in my opinion, lie not only against the contractor but also against the Department for any damage that is caused by operations carried out under the direction of the Engineer in accordance with clause 14.

“ As between the Department and the contractor, however, I think clause 11 will give the Department the right to charge the contractor with any damage which the Department may have been called upon to pay.

“ In view of the liability attached to the Department, I think it is the duty of the engineer-in-charge, and he should be so instructed, to take every possible care, in exercising his functions under clause 14 with regard to explosives, that in authorising the use of any such explosives no possibility of any damage to any building or property could arise.

“ If there is any risk, I think that he should not give his order in writing.

“ I have, &c.,

“ E. A. SMITH,

“ Crown Solicitor.”

## Appendix No. 4.

W. SCHILL v. CARTER, GUMMOW, &amp; Co. ; A. Schill v. Carter, Gummow, &amp; Co.

Minute by Mr. Davis upon Crown Solicitor's opinion.

FROM this it would appear that the contractors are, strictly speaking, liable, and that the Department, seeing that it had “*personal control*” by specifying the sizes of charges to be used, and by measuring depth of holes, &c. (see clauses 65 and 66 of the Schedule to Specification), is also to some extent responsible.

When in carrying out work under instructions damage has been done to property, not through any neglect on the part of the contractor, but what might be regarded as incidental to the carrying out of the work, and to be expected in the natural course of events, the Department, and not the contractor, has satisfied the claims, except in those cases in which the compensation sought has only been very small.

In the present instance, if the claimants had brought their suit against the Department, as they should have done, according to the Crown Solicitor, the cases could no doubt have been defended, because:—

Firstly,—The officers of the Department were strongly of opinion that no damage had been done to the properties in question.

And Secondly,—Many other property-owners who were asking for compensation were similarly situated to the Schills, and, if they had been settled with, the others must have been treated in the same way.

The contractors, knowing what was involved, determined, and properly, I think, to resist the claims.

There were three of these cases up to the end of March. The first two went against the contractors, but the third against the property-owner, and the failure in that instance has, I believe, had the effect of making many hesitate before bringing a suit to recover compensation for alleged damages.

Under

Under these circumstances, I am inclined to think that the Department would only be acting in accordance with its usual custom in refunding the £196 17s. 4d. At the same time, I desire to point out that, so far as I am aware, this is the only case in which matters of this description have been dealt with through the contractor.

J. DAVIS.

Papers might be forwarded to Mr. Darley. When the Minister has decided the question, I should like to see the papers, for my guidance.—ROBT. HICKSON, Engineer-in-Chief for Public Works, 5/8/95. Under Secretary. Mr. Darley, J.B., 9/8/95.

### Appendix No. 5.

Mr. R. A. Arnold to The Under Secretary for Public Works.

Contract No. 79A.—North Sydney Sewerage Works.

Sir,

I desire to bring under your notice the following facts, and ask for your prompt and favourable consideration of the same.

During the tunnelling from the upper shaft in M'Dougall-street (just completed) for that portion of the North Sydney Sewerage Scheme, I had on several occasions to complain to the Engineer in charge of the work (first Mr. Boys, and latterly Mr. Weedon) that the vibration from the blasting was so severe as to shake my whole cottage (a solidly built stone structure); that some of my windows had been broken; and that the walls and ceilings were cracking in all directions. I also made similar communications to the contractors Messrs. Carter, Gummow, and Co., and intimated that I should expect the damage done to my building to be made good.

The damage actually apparent is the breakage of six large panes of glass (one of which I was obliged to have replaced in August last at a cost of 22s. 6d.), cracks in many places in the walls and ceilings, and the opening of what were before mere hair cracks, and the breaking of several slates in the roof.

I estimate that it will cost me to repair the damage:—

|   | £   | s. | d. |
|---|-----|----|----|
| Five large panes of glass, about 5 ft. x 3 ft.; labour of fitting, &c., at, say, 22s. each.....               | 5   | 10 | 0  |
| One smaller pane, about 2 ft. 6 in. square, say .....   | 0   | 10 | 0  |
| Cleaning out and refilling cracks in plaster of the walls and ceilings, say .....                             | 3   | 0  | 0  |
| Towards recolouring the walls, &c., a work only rendered immediately necessary for the damaged one, say ..... | 10  | 0  | 0  |
| Damage to slates on the roof .....  | 1   | 0  | 0  |
|   | £20 | 0  | 0  |

Besides this, there is the damage done to the structure by the shaking it has received, which is difficult to estimate at a fixed sum, but on which I shall be pleased to confer with any officer who may be able to report on the matter.

As I am desirous of having the necessary work of repairing done as soon as possible, I shall be glad if you will have my claim inquired into at once.

I am, &c.,

RICHD. A. ARNOLD.

Mr. Smail for report for U.S.—JNO. P., 26/6/95. Mr. Smail for report.—C.D., 1/7/95. Mr. Cook.—T.G., 1/7/95. Report and tracing herewith.—W.E.C., 3/7/95. Fwd. J. M. Smail, Esq.—T.G., 4/7/95. Mr. Boys might be asked if he knows anything about this claim.—J.M.S., 15/7/95. Mr. Griffiths. Mr. Cook saw Mr. Weedon yesterday and discussed the matter with him, the latter gentleman handing in two letters herewith attached. It was thought that £10 might be offered as a reasonable compensation.—T.G., 16/7/95. Mr. Arnold's claim does not on the face of it appear an unreasonable or made-up claim. If our works did all the damage stated, he should be recompensed by either the Department or the contractor. The two officers who had charge of the work at the time (Messrs. Weedon and Boys) have not been transferred to this Branch, so perhaps Mr. Hickson might be asked to obtain their reports as to what they know of the occurrence. I gather from Mr. Arnold's letters that they visited the house.—C.D., 17/7/95. The U.S., P.W. Mr. Hickson for report for U.S.—JNO. P., 18/7/95. Mr. Boys for report in first instance.—W.S., 19/7/95. Messrs. Boys and Weedon's reports attached.—J. DAVIS, 30/7/95, for Engineer-in-Chief for Public Works. Under Secretary. Mr. Darley, for U.S.—JNO. P., 30/7/95. From perusal of the reports, there is no doubt but that the blasting must be in a great measure the cause of the injury to Mr. Arnold's house. I, therefore, recommend that the sum of £10 be offered in full discharge.—C.D., Engineer-in-Chief, Metropolitan Sewerage Division, 2/8/95. The U.S., P.W. For approval, £10 without prejudice.—J. BARLING, Secretary for Public Works, 5/8/95. Appd.—J.H.Y., 6/8/95. Write, 6/8/95. R. A. Arnold, Esq., 7/8/95. Resubmit with reply.—JNO. P., 7/8/95.

### Appendix No. 6.

Inspector G. A. Fowle to Resident-Engineer Weedon.

Sir,

19 February, 1894.

I beg to report that on several occasions I have had to complain about the time the sandstone concrete is mixed for packing brickwork in shafts. To-day two 20-foot mixings were made up at 2 p.m. at No. 5 shaft. This concrete will not be put down shaft for use till 5.30 p.m. I have instructed Connors' foreman, who has charge of this work, not to have the concrete mixed so long before being used. He states to me that he has to take his instructions from the firm.

I saw Mr. Snodgrass last Friday, and complained to him about this matter, when he promised it should not be mixed until one hour before it is required to be used. I spoke to Reid (contractors' representative) to-day, and he states that they shall mix the cement when convenient for themselves.

Inspector Reid informs me that on Saturday last, 17th February, about 1 p.m., at No. 6 shaft, it required half mixing 10 feet of sandstone concrete to finish brickwork packing in shaft. Henderson, bricklayer, working in shaft, was on mixing board, and started to assist labourer gauge the stone. Inspector Reid instructed Henderson to use the fork in place of shovel in filling gauge-box, as the stone which is broken close to mixing-board is not free from refuse. Inspector Reid asked Henderson the second time to use fork. Henderson replied that it did not want forking. Connor's foreman came on the scene and said to Henderson, "Go on; don't take any notice of him; he is only a damn big buck navy."

G. A. FOWLE,

Inspector.

### Appendix No. 7.

Mr. A. Armstrong (Agent for Messrs. Carter & Co.) to The Hon. W. J. Lyne.

Sir,

5, Spring-street, Sydney, 3 April, 1893.

I have the honor to direct your attention to a patent, No. 4,084, issued on 3rd November, 1892, to Messrs. Carter, Snodgrass, and Baltzer, for the purpose of strengthening, and at the same time cheapening, the construction of sewer and other arches, as described in such patent as "invention of improvements" in concrete, cement, and mortar building, and other constructions and manufactures.

I am desired by my clients to state that they are willing to dispose of their sole powers and rights granted in such patent, and to offer the same to your Department for the sum of £1,500.

I have, &c.,

A. ARMSTRONG,

Agent for Messrs. Carter & Co.

## Appendix No. 8.

Messrs. Carter, Gummow, &amp; Co. to The Engineer-in-Chief for Sewerage.

Marrickville, 11 November, 1894.  
 Sir, In reply to your letter of 11th October, with regard to alteration of design between Premier-street shaft and Illawarra Road, we beg leave to state that we will accept the terms therein, provided a special item be arranged for the filling, at the rate of 5s. per cubic yard.

Yours, &c.,  
 CARTER, GUMMOW, & CO.,  
 Contract No. 69.

Mr. Davis.—R.H., 11/11/94. Commissioner for Roads.—D.C.M.L. (*pro* U.S.), B.C., 15/11/94. Will Mr. Weedon please let me have quantity of filling.—J.D., 17/11/94. Quantity of filling, due to alteration in design, 410 cubic yards.—S.H.W., 20/11/94.

The schedule rate for filling is 6d. per cubic yard; but it is manifest that the contractors, in giving this low price, did not contemplate doing the kind of filling required in connection with the western branch sewer, between Premier-street and Illawarra Road. The 5s. asked is, I consider, a little high; but I suppose, as they will lose something by the reduction of concrete and brickwork, occasioned by the alteration, it will be just to take this into account, and allow them what they ask. There will be about 400 cubic yards of this filling, which, at 5s. per cubic yard, would amount to £100. I recommend that the price named be approved.—J.D., 21/11/94. Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage.

This addition is caused by an alteration in the original design, which has the effect of reducing the cost of the work in this contract by about £750, and a further reduction on the whole work of £10,000. Recommended for approval.—R.H., 21/11/94.

For approval.—J.B., 28/11/94. Approved.—J.H.Y., 29/11/94. Roads.—D.C.M.L. (*pro* U.S.), B.C., 29/11/94. Seen.—R.H., 30/11/94. Mr. Weedon to note.—J.D., 4/12/94. Noted.—S.H.W., 6/12/94. File.—J.D., 7/12/94.

## Appendix No. 9.

No. 1.

C. H. Ohlfsen-Bagge, Esq., to The Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage.

21 September, 1894.

WESTERN OUTFALL SEWER—4TH DIVISION—ABOUT 40 CHAINS IN LENGTH.

THREE designs are herewith submitted for the consideration of the Engineer-in-Chief, each design with an open aqueduct carried upon arches and piers. The aqueduct, or main carrier, is capable of discharging 11,000 cubic feet of sewage per minute, which is equal to two 6-foot diameter outfall sewers, running three-quarter full, with a gradient of 1 in 2,000.

The sewerage aqueducts have hitherto been constructed here in such a manner, method, and of such materials, that any competent tradesman, in his special line, obtainable in the Colony, could do the work.

Now, however, as it is a matter of the greatest importance to reduce the cost of the works, there seems to be no other way of accomplishing this object, but to adopt for this Colony a more or less experimental system of construction for these aqueducts,—of increasing the spans of arches, introducing arches with joints, of constructing the whole in concrete, and of constructing the whole of the work of concrete and mortar and iron.

In the Old Home countries these novel systems of construction have caused in the commencement failures, owing to the works being carried out by more or less inexperienced and untrained engineers and artisans; hence the various State Governments would not entertain and construct works on these novel methods until special companies established themselves, who made it their special business to carry out such works with artisans who had had time to gain the necessary experience, and who had been practically and specially trained in the construction of such work.

It was only to such companies that works, which are termed purely and simply specialities, were entrusted, after they had given adequate security for the faithful, careful, and competent execution of same.

1st Scheme.

To be constructed on the system of Road-Engineer Koch, of Ulm, as reported by the Association of German Cement Manufactures, in their publication of 1892.

The concrete aqueduct rests on 50-foot span arches, concrete piers, and pile foundations. The piers are to be built on sixteen 18-inch diameter hardwood round piles, assumed to be 30 feet in length; each pile will have to carry 25 tons.

The pile-heads to be cut off level at a depth of 7 feet below datum, and from 9 inches below heads of piles, to a depth of 3 feet. They are to be filled in between with rubble packing, to make a footing for the concrete foundation course; the latter to be built of sandstone concrete.

The pier itself to be built of bluestone concrete, rounded on top as shown, and the rounded surface to be covered  $\frac{3}{4}$ -inch thick with asphalt (bitumen and cork), while the faces of the skewback are to be covered with Val de Travers' asphalt,  $\frac{5}{8}$ -inch thick.

In former sewerage aqueducts, which were built on piers and brick arches, it was specified, in order to reduce the cost of the centering, that not less than six arches should be constructed at a time, which necessitated an abutment-pier at the end of each series of six arches. These abutment-piers are, for economical reasons, not to be introduced in any of these schemes. It will, therefore, be necessary to at once provide in the construction for more centerings, perhaps fifteen at a time, which would be sufficient for about one-third of the length of the aqueduct, as all arches built of concrete require at the very least four weeks' time to harden before the centres can be removed.

A concrete arch of 50 feet span settles the moment the centres are removed. The more rigid and the more watertight the centres are made the less settlement of the arch takes place, which will vary from 5 inches to 1 inch accordingly; and the longer the centres are left under the arch, the less settlement takes place, provided always that the centres are made thoroughly watertight.

The removal of the centres has to be done with utmost care. The 50-foot span arches, having each a radius of 47 feet, and a rise of 7.2 feet, are 12 inches thick at the crown and 18 inches at the springing, with a  $\frac{3}{8}$ -inch thick transverse butt-joint at the crown, filled in with Val de Travers' asphalt, and the total horizontal thrust at this joint is 235 tons, with a safety factor of 8.7 at the area of cross-section in centre of arch. The arches are calculated upon Scheffler's theory, as described in Ira O. Baker, C.E., treatise on masonry construction, pages 474 to 479, of 1891. This arch is given liberty to contract and expand and move up and down without cracking. The tendency of concrete is the same as wrought-iron as regards expansion and contraction. The rise and fall of the arch should not exceed 1 inch at a difference of 60 degrees in the temperature.

The arches are to be built of bluestone concrete, and jointed, require very rigid centerings, and very careful, uniform manipulation, handling, and filling in of the concrete.

After the arches are completed, the concrete between the haunches (spandrels) to be built in, the outer faces 18 inches thick of bluestone concrete, and the inner filling of gravel concrete in the proportion of 1 cement, 3 sand, and 6 gravel.

There is to be a vertical butt-joint over centre of pier of  $\frac{5}{8}$ -inch, filled in with  $\frac{5}{8}$ -inch mastic plate. The joint extends right across and from top of pier to 9 inches below invert of aqueduct. It is to allow the arch to expand and contract without causing cracks in the concrete.

The main carrier (aqueduct, 8 ft. 8 $\frac{1}{2}$  in. x 5 ft. 3 in.) is to be built of bluestone concrete, its side walls on the reservoir dam principle, and to prevent its cracking, in consequence of expansion and contraction taking place, the concrete is strengthened and held together longitudinally at the base of each side-wall by four  $\frac{3}{4}$ -inch diameter iron bond-rods, and in the upper part of each side-wall by six  $\frac{3}{8}$ -inch diameter iron bond-rods, spaced as shown, and walled in with the concrete as the work progresses. The cement adheres to the iron rods with a force of about 675 lb. to the square inch surface of iron rod.

Over the centre of each pier the concrete of aqueduct has a transverse vertical butt-joint,  $\frac{5}{8}$ -inch wide, filled in with mastic plate, and the joint is made watertight by a 5-in. x 10-in. channel, built down in the side-walls and underneath invert of carrier, filled in with mastic.

PROBABLE

## PROBABLE Estimate of the Cost of 58 feet length of Aqueduct, from centre line of Pier to centre line of Pier.

| No. of Item                         | Description of Work.  | Unit.       | Quantity. | Rate.            | Amount.           |
|-------------------------------------|---|-------------|-----------|------------------|-------------------|
| 1                                   | Sixteen 18-inch diameter 30-ft. piles .....                             | lineal foot | 480       | £ s. d.<br>0 3 6 | £ s. d.<br>84 0 0 |
| 2                                   | Rubble packing, 3 feet deep, at top of piles .....                      | cubic yard  | 19        | 0 5 0            | 4 15 0            |
| 3                                   | $\frac{3}{4}$ -inch round wrought-iron bond-rods .....                  | cwt.        | 16        | 0 15 0           | 6 0 0             |
| 4                                   | Asphalt joints, $\frac{3}{8}$ -inch and $\frac{1}{2}$ -inch thick ..... | square foot | 168       | 0 0 3            | 2 2 0             |
| 5                                   | Mastic-plate joint .....  | "           | 120       | 0 0 3            | 1 10 0            |
| 6                                   | Mastic-channel joint .....  | lump sum    | .....     | .....            | 1 14 6            |
| 7                                   | Excavation .....  | cubic yard  | 58        | 0 2 0            | 5 16 0            |
| 8                                   | Sandstone concrete .....  | "           | 22.84     | 1 8 0            | 31 19 6           |
| 9                                   | Gravel concrete .....   | "           | 51.62     | 1 1 0            | 54 4 0            |
| 10                                  | Bluestone concrete .....  | "           | 155.45    | 2 2 0            | 326 9 0           |
| 11                                  | Rendering .....   | square yard | 366       | 0 2 0            | 36 12 0           |
| Total for a length of 58 feet ..... |   |             |           |                  | 555 2 0           |

At per lineal foot, £9 11s. 5d. ; or at per lineal yard, £28 14s. 3d.

## 2nd Scheme.

The 2nd scheme proposed is to be built on the same principle, the rise and spans of arches, &c., as the 1st scheme, with the exception of the main carrier, which, although of the same internal dimensions, is to be built with much thinner side walls, which reduces the outside width of aqueduct from 14 feet to 10 ft. 8 in., and thus materially diminishes the general quantities.

The side walls of the aqueduct, being so much thinner, are to be strengthened, each wall, by vertical  $\frac{3}{8}$ -inch diameter wrought-iron bond-rods, spaced 2 ft. 7 $\frac{1}{2}$  in. from centre to centre, and nine longitudinal  $\frac{3}{4}$ -inch diameter wrought-iron bond-rods, spaced and built in as shown. Along the outside faces of copings a 4-in. x 2-in. x  $\frac{1}{4}$ -in. channel-iron to be built in, and transverse, 2 $\frac{3}{4}$ -in. x 2 $\frac{3}{4}$ -in. x  $\frac{3}{8}$ -in.  $\Gamma$  iron braces are to be placed, spaced 7 ft. 10 in. from centre to centre, and bolted on to the channel-iron of each side wall.

The transverse butt-joints in concrete work of aqueduct are similar to those of the 1st scheme, with the exception of the 5-in. x 10-in. channel-joint round the aqueduct, which is to be left out in this instance, and a  $\frac{3}{8}$ -in. straight transverse joint is provided instead over centre line of pier, filled in with mastic plate.

The 50-foot span arch, with rise of 7.2 feet, is 12 inches thick in centre and 21 inches at the springing, and has a transverse butt-joint in the centre of  $\frac{3}{8}$  inch, filled in with asphalt (Val de Travers). The total horizontal thrust at centre is 144 tons, with a safety factor of 10 at the area of cross-section in centre of arch.

The piers to be built on twelve 18-inch diameter piles, filled in between at top, 3 feet deep, with rubble-stone packing to make sound footing for concrete pier. Each pile has to carry 22 tons, as against 25 tons of the 1st scheme.

The foundation courses under each pier to be built of sandstone concrete; the pier, arches, aqueduct, and outer faces of spandrels to be built of bluestone concrete, while the filling in between the haunches of arches to be done with gravel concrete.

## PROBABLE Estimates of the Cost of 58 feet length of Aqueduct, from centre line of Pier to centre line of Pier.

| No. of Item.                        | Description of Work.   | Unit.       | Quantity. | Rate.            | Amount.           |
|-------------------------------------|--|-------------|-----------|------------------|-------------------|
| 1                                   | Twelve 18-inch diameter 30-ft. long piles .....  | lineal foot | 360       | £ s. d.<br>0 3 6 | £ s. d.<br>63 0 0 |
| 2                                   | Rubble-stone packing at top of piles, 3 feet deep .....  | cubic yard  | 10.5      | 0 5 0            | 2 12 6            |
| 3                                   | Wrought-iron 4 in. x 2 in. x $\frac{1}{4}$ -in. channel-iron, 116 feet .....   | cwt.        | 7.954     | 1 2 0            | 8 15 0            |
| 4                                   | " eight 2 $\frac{3}{4}$ in. x 2 $\frac{3}{4}$ in. x $\frac{3}{8}$ in. x 11 ft. $\Gamma$ irons, with thirty-two $\frac{3}{4}$ in. screw-bolts—24 lb. in all.  | "           | 5.125     | 1 2 0            | 5 12 9            |
| 5                                   | Eighteen longitudinal $\frac{3}{4}$ in. x 60 ft. diameter bond-rods—1,594.7 lb., forty-four vertical bond-rods $\frac{3}{8}$ in. diameter x 66 ft.—3,003 lb. | "           | 16.92     | 0 15 0           | 12 13 10          |
| 6                                   | Mastic and asphalt in joints .....   | lump sum    | .....     | .....            | 2 8 0             |
| 7                                   | Excavation .....   | cubic yard  | 39        | 0 2 0            | 3 18 0            |
| 8                                   | Sandstone concrete .....   | "           | 7.07      | 1 8 0            | 9 18 0            |
| 9                                   | Bluestone concrete .....   | "           | 101.25    | 2 2 0            | 212 12 6          |
| 10                                  | Gravel concrete .....  | "           | 40        | 1 1 0            | 42 0 0            |
| 11                                  | Rendering .....  | square yard | 336       | 0 2 0            | 33 12 0           |
| Total for a length of 58 feet ..... |  |             |           |                  | 397 2 7           |

At per lineal foot, £6 16s. 11.3d. ; or per lineal yard, £20 10s. 10d.

In support of the system applied for the construction of the two schemes just described, I can refer, amongst similar structures, to the one built by Mr. Road-Engineer Koch, of Ulm, as reported in the publication of the Association of German Portland Cement Manufactures in 1892, and to one road bridge built by Von Liebbrand, as reported in the Proceedings of the Association of German Engineers of 28th July, 1894 (page 908).

Mr. Koch's concrete bridge was built near Erbach, on the Danube, in Württemberg, with a jointed arch of 104.98-foot span, rise of arch 13 feet, thickness at the crown 1 ft. 7 $\frac{1}{2}$  in., and at the springing 2 ft. 4 in., and a width of roadway between parapets of 19 ft. 6 in. The arch was built in transverse slips 31.49 inches in width, with radiating end faces held by boards, well rammed. On removal of centering (after two months) the arch settled at the crown about 1.9685 inch, and after the road material had been placed in position the total settlement at the crown amounted to 4.7244 inches. This bridge was built by the Association of German Portland Cement Manufacturers.

Mr. Von Liebbrand's concrete bridge was built over the Danube in one arch of 162.5-foot span, with a rise of 16.25 feet, 3.25 feet thick in centre, and 3.6 feet thick at the springing. The arch rests at one side upon hard limestone rock, and on the other side on a pile foundation. The bridge is also a road bridge, 25 feet wide between parapets; it has been built near Munderkingen, in Württemberg, and has stood, at the time when it was reported, from 16th November, 1893, till 28th July, 1894.

These bridges carry roadways, whereas those of the two schemes herein described will have to carry an aqueduct, with such precautionary arrangements, however, which should be sufficient to prevent the concrete from cracking.

## Drawings accompanying Schemes Nos. 1 and 2.

Schemes Nos. 1 and 2 are accompanied each by one sheet of drawing, showing the proposed general design, and one sheet of drawing showing diagram of forces on the arch and at the abutment pier at Muddy Creek. The blue lines in arches and abutments show the line of pressure as the result of Scheffler's theory, and the red lines in the other diagrams show the resultants in size and direction.

The diagram at side wall of aqueduct of the first scheme shows the resultant in position, size, and direction of water pressure and weight of water at a point 45 inches below top of wall when aqueduct is supposed to be running full up to level of top of coping.



## 3rd Scheme.

Proposed to be constructed on the Monier system, with concrete piers on pile foundations, 75-foot span arches of 80 feet radius, rise of arch 9.3 feet; spandrels of dwarf-piers and small arches carrying the aqueduct.

The piers to be built on 12 18-inch diameter piles, assumed to be 30 feet in length, each pile to carry 22.25 tons. Pile heads to be cut off level at a depth of 7 feet below datum. From 1 ft. 6 in. below heads of piles, and for a depth of 3 feet, the piles to be filled in between with rubble-stone packing to ensure a solid foundation for the concrete foundation courses, to be built of bluestone concrete.

The piers to be built of bluestone concrete, excepting recesses for reception of footing of arch, which, when the latter is being built, will be filled in with cement mortar the same as arch.

The 75-foot span arch to be constructed on perfectly rigid and watertight box centering, of which no less than 10 should be provided at a time.

The arches to be 10 inches thick at the crown and 14 inches thick at the springing; total width, 9 ft. 5 in., to be constructed of cement mortar in the proportion of 1 to 3, strengthened by a wrought-iron network for the whole length and width, placed  $\frac{3}{4}$  inch above intrados of arch, and a similar network placed  $\frac{3}{4}$  inch below extrados of arch, extending from each springing for a length of about 29 feet up the arch. The building of each arch to be commenced at both ends simultaneously and continued towards the crown without intermission until completion.

The lower and upper wrought-iron network to consist of  $\frac{3}{8}$ -inch diameter longitudinal rods, spaced 2 $\frac{1}{2}$  inches from centre to centre, and the cross-bars to be  $\frac{1}{2}$ -inch diameter rods, spaced 3 inches from centre to centre.

The total horizontal thrust at crown of arch is 180 tons, equal to 356 lb. per square inch of sectional area of same, whereas a square inch ought to stand 2,000 lb. (factor of safety, 5.618).

The spandrels, between extrados of main arches and underside of aqueduct, to be constructed of dwarf-piers and small arches as shown. The dwarf-piers to be built of bluestone concrete, but the plinths of said piers to be built of cement mortar of the same quality as to be used in the main arches, and simultaneously with the arches. Dwarf-piers to be 12 inches thick, excepting the 2-foot piers between main arches; all piers to be built of concrete up to springing of small arches, and above that level they are to be completed with cement mortar, built in simultaneously with the small arches. The upper part of central pier to be rounded off at top as shown, and covered 1 inch thick with asphalt (bitumen and cork).

The vertical 1-inch joint to be filled in with mastic plate, and the 3-inch by 4-inch channel joint to be filled in with mastic.

The piers in the first instance to be built up to level of springing throughout a length of 660 feet at a time, and, on completion of the piers of the second length of 660 feet, the small arches of a series of 60 at the time to be constructed over the piers over the first length of 660 feet, and so on, to ensure the whole structure being evenly and uniformly weighted as it progresses.

The piers are spaced 7 ft. 3 in. apart, and closed in at top with arches built of cement mortar (1 to 3) and wrought-iron. The small arches with a radius of 6 ft 7 $\frac{1}{2}$  in. and 13 inches rise, to be built on rigid watertight box centerings; they are to be 3 inches thick at the crown and 5 inches thick at the springing, 9 ft. 5 in. in width, and strengthened by a wrought-iron network of the same description as that for the 75-foot span arches, placed  $\frac{3}{4}$ -inch above intrados of arches.

The total horizontal thrust at crown of small arches is 13 tons, which gives 85 lb. per square inch of sectional area, equal to twenty-three times security.

The spandrels between extrados of small arches and underside of aqueduct and the narrow portion of spandrels near crown of main arch to be built in with fine bluestone (bluestone toppings) concrete.

The aqueduct to be 8 ft. 1 $\frac{1}{2}$  in. wide at top and 5 ft. 3 in. deep, although a few inches less in width than the aqueducts of the 1st and 2nd schemes, its sides are less battered, and its bottom or invert being straighter, has the same cross-section area, and can therefore discharge the same quantity of sewage.

The side walls and invert to be constructed of cement mortar in the proportion 1 in 2, the side walls at the top to be 4 $\frac{1}{2}$  inches thick, and at a depth of 3 ft. 9 in. from the top to be 6 inches thick; the level portion of invert to be also 6 inches thick. The walls and invert to be strengthened by wrought-iron network, one to be placed 1 $\frac{1}{2}$  inch below inner face of aqueduct, and one to be placed vertical 1 $\frac{1}{2}$  inch below outside faces of side walls of same.

These networks to be made of  $\frac{1}{4}$ -inch diameter longitudinal rods, with the exception of the six upper rods in each side wall, which are to be  $\frac{3}{8}$ -inch diameter; all to be spaced 2 $\frac{3}{4}$  inches from centre to centre, and the cross-bars to be  $\frac{3}{8}$ -inch diameter, spaced 2 $\frac{1}{2}$  inches from centre to centre on the inside of aqueduct, while for the outside faces of same the longitudinal rods to be 3 inches and the vertical cross-bars 4 inches from centre to centre.

To prevent the aqueduct from cracking there is to be an inch butt-joint right across same over the centre of the main pier, to be filled in with mastic plate. The joint to be made water tight by a 3-in. x 4-in. channel joint running vertically down the side walls and underneath invert of aqueduct, to be filled in with mastic.

The inner and outer surfaces of aqueduct, front elevation of main arches, dwarf-piers, and small arches, and main piers all round, to be rendered  $\frac{5}{8}$ -inch thick with cement mortar (1 to 2).

The main piers of aqueduct are corbelled out on elevations of same, as shown, to be built up to the level of top of side walls, leaving an inch space between it and outer face of side wall, to be filled in with mastic plate.

## Drawings accompanying the 3rd Scheme.

Scheme No. 3 is accompanied by one sheet of drawing, showing the proposed general designs, and by a second sheet of drawing showing diagrams of forces on the 75-foot span arches, loaded and not loaded, and on the 7 ft. 3 in. arches loaded only. The blue lines in the diagrams show the line of pressure as the result of Scheffer's theory, checked by the theory of elastic arches (by W. M. Cain, C.E.), and the red lines in the diagrams show the resultants in size and direction.

## PROBABLE Estimates of the Cost of 83 feet length of Aqueduct, from centre line of Pier to centre line of Pier.

| Item | Description of Works.  | Unit.           | Quantity. | Rate.   | Amount.  |
|------|--|-----------------|-----------|---------|----------|
| 1    | Twelve 18-inch diameter piles, 30 feet long .....  | lineal foot     | 360       | £ 0 3 6 | £ 63 0 0 |
| 2    | Rubble-stone packing at top of piles, 3 feet deep .....  | cubic yard      | 10.5      | 0 5 0   | 2 12 6   |
| 3    | Excavation at pier foundation.....   | "               | 39        | 0 2 0   | 3 18 0   |
| 4    | Bluestone concrete in main and spandrel pier .....   | "               | 34.41     | 2 2 0   | 72 5 3   |
| 5    | Fine bluestone concrete in spandrels .....   | "               | 11.8      | 2 2 0   | 24 15 7  |
| 6    | Cement mortar in aqueduct (1 to 2) including wrought-iron network .....  | "               | 26.5      | 4 10 0  | 119 5 0  |
| 7    | Cement mortar in (1 to 3) main and spandrel arches, including wrought-iron network .....   | "               | 39.81     | 4 0 0   | 159 5 0  |
| 8    | Cement rendering in aqueduct, piers, front faces of arches, spandrel fillings.....   | square yard     | 323       | 0 2 0   | 32 6 0   |
| 9    | Asphalt in joints.....   | square foot     | 14        | 0 0 3   | 0 3 6    |
| 10   | Mastic in joints .....   | cubic foot      | 2.88      | 0 12 0  | 1 14 6   |
| 11   | Patent right fees due on account of work done on the Monier system in arches and aqueduct, at rate of 15 per cent., on items 6, 7, 8, 9, 10, amounting to £310 0s. 4d. | at 15 per cent. | .....     | .....   | 46 10 0  |
|      | For a length of 83 feet—Total.....   | .....           | .....     | .....   | 525 15 4 |

At per lineal foot, £6 6s. 8.3d.; or at per lineal yard, £19 0s. 1d.

## Calculations.

All that we know so far of the mode of constructing works designed on the Monier system is described in pamphlets giving a number of works carried out by the patentees, accompanied by sketches and photos of said works, and furnishing the reason for which the work was carried out, and the sizes and dimensions on the sketch drawings, but giving no clue whatever as to any formula or principle that ought to be used in calculating the forces which should have to be contended with in the various structures enumerated in said pamphlets.

In order to meet this difficulty the radius of the 75-foot span arch of Scheme No. 3 had to be so selected that the centre line of forces (line of resistance) should always keep within the middle third of the arch ring.

The centre line of resistance was constructed by Scheffler's theory, and checked by the theory of elastic arches (W. M. Cain, C.E.), after which the thickness of the arch was determined in a manner so that at no part the compression exceeds 400 lb. per square inch, which, in this instance, fixed the minimum thickness of arch at 10 inches at the crown and at 14 inches at the springing, giving a safety factor of 5.618.

The wrought-iron network was mainly to be laid in as additional security, to strengthen the arch, on account of the low factor of safety and the light structure of the arch.

Exactly the same system has been adhered to in the construction and calculation of the arches in the spandrels.

With respect to the aqueduct in connection with the third scheme, on the Monier system, it must be borne in mind that the office had also to adopt its own method for ascertaining the strength and dimensions for the invert and sidewalls of same, which resulted in fixing the width of top of sidewall at 4½ inches, the outer faces of sidewalls to be vertical, and at a depth 3 ft. 9 in. from top of sidewall, the latter to 6 inches thick, the invert at end of side curve to be always 6 inches thick.

Summary.

| Name of Scheme.  | Span of Arch. | Rise of Arch. | Factor of Safety. | Cost per lineal foot. | Cost per lineal yard. | Length of Work. | Total Cost. |
|------------------|---------------|---------------|-------------------|-----------------------|-----------------------|-----------------|-------------|
|                  | feet.         | feet.         |                   | £ s. d.               | £ s. d.               | feet.           | £ s. d.     |
| 1st scheme ..... | 50            | 7.2           | 8.7               | 9 11 5                | 28 14 3               | 58              | 550 2 0     |
| 2nd „ .....      | 50            | 7.2           | 10.0              | 6 16 11.3             | 20 10 10              | 58              | 397 2 7     |
| 3rd „ .....      | 75            | 9.3           | 5.618             | 6 6 8.3               | 19 0 1                | 83              | 525 15 4    |

Mr. Ahern's present outfall sewer, Contract No. 101, if calculated for two sewers  
of 6 feet diameter, would cost ... .. £10 16 1 £32 8 3

C. H. OHLFSEN-BAGGE.

No. 2.

Mr. C. H. Ohlfesen-Bagge to The Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage.

Sydney, 14 March, 1894.

THE tenders for the construction of the northern main sewer, Annandale and Leichhardt sections, Contract No. 77, have now been checked, the lowest being that of Messrs. Carter, Gummow, & Co., at 28½ per cent. below schedule rates, amounting to £15,757 ls. 9d.

The following are the other tenderers :—

|                                       |  |
|---------------------------------------|--|
| Messrs. J. M'Sweeney .....            | At 25½ per cent. below schedule rates. |
| J. F. Carson .....                    | „ 20 <sup>1</sup> / <sub>100</sub> „ „ |
| Gilliver and Curtis .....             | „ 18 <sup>7</sup> / <sub>8</sub> „ „   |
| Holloway Bros. ....                   | „ 18 <sup>3</sup> / <sub>4</sub> „ „   |
| J. Stewart & Co. ....                 | „ 18 <sup>1</sup> / <sub>5</sub> „ „   |
| Howie Bros. ....                      | „ 17 <sup>1</sup> / <sub>2</sub> „ „   |
| Hugh Owen.....                        | „ 15 „ „                               |
| Phillips, Rhodes, and Broughton ..... | „ 13 „ „                               |
| R. and S. Butcher .....               | „ 11 „ „                               |
| E. Taylor.....                        | „ 10 <sup>1</sup> / <sub>2</sub> „ „   |
| Maddison and Ewing .....              | „ 8 <sup>1</sup> / <sub>2</sub> „ „    |
| T. Williams.....                      | „ 6 <sup>1</sup> / <sub>4</sub> „ „    |
| T. E. Spencer .....                   | „ 5 „ „                                |
| Carter, Gummow, & Co. ....            | Lump sum of £15,500.                   |

With respect to Messrs. Carter, Gummow, & Co.'s second tender for a lump sum of £15,500, I find that it is accompanied by a special design on the "Monier" system.

The plans for the White's Creek and Johnstone's Creek aqueducts as designed in this office, for which tenders were invited, were prepared with a view to securing the most substantial and enduring structure at the most reasonable cost. At the time that this design was made I had as full particulars regarding the "Monier" principle as it was possible to obtain in the Colonies. I would also like to point out that in Europe this class of work is made a speciality, being patented, and is wholly in the hands of private companies, who are required to give a substantial guarantee for the stability of their work. I think it would not be advisable to construct at the outset a work of such importance on the "Monier" principle.

|  |         |
|--|---------|
| The total for the office design amounts to ..... | £15,757 |
| „ contractor's Monier design .....               | 15,500  |
| Difference .....                                 | £257    |

C. H. OHLFSEN-BAGGE.

No. 3.

List of Tenders received for Contract No. 77.

Wednesday, 13 March, 1895.

|  |                                      |              |
|--|--------------------------------------|--------------|
| Number of tenders received .....         | Fifteen.                             |              |
| Estimated amount .....                   | £22,037 17s. 8d.                     |              |
| Amount of lowest tender .....            | 28½ per cent. below schedule rates.  |              |
| Name of lowest tenderer .....            | Carter, Gummow, & Co.                |              |
| Vote .....                               | £830,000. 53 Vic. No. 33.            |              |
|  | Amount. Deposit. Nature.             |              |
| 1. Carter, Gummow, & Co.....             | 28½ per cent. B.S.                   | £160 Cheque. |
| 2. J. M'Sweeney .....                    | 25 <sup>1</sup> / <sub>2</sub> „ „   | 166 „        |
| 3. J. F. Carson .....                    | 20 <sup>1</sup> / <sub>100</sub> „ „ | 177 „        |
| 4. Gilliver and Curtis .....             | 18 <sup>7</sup> / <sub>8</sub> „ „   | 180 „        |
| 5. Holloway Bros.....                    | 18 <sup>3</sup> / <sub>4</sub> „ „   | 180 „        |
| 6. J. Stewart & Co. ....                 | 18 <sup>1</sup> / <sub>5</sub> „ „   | 220 „        |
| 7. Howie Bros. ....                      | 17 <sup>1</sup> / <sub>2</sub> „ „   | 182 „        |
| 8. Hugh Owen .....                       | 15 „ „                               | 190 „        |
| 9. Phillips, Rhodes, and Broughton ..... | 13 „ „                               | 190 „        |
| 10. R. J. S. Butcher .....               | 11 „ „                               | 200 „        |
| 11. E. Taylor .....                      | 10 <sup>1</sup> / <sub>2</sub> „ „   | 192 „        |
| 12. Maddison and Ewing .....             | 8 <sup>1</sup> / <sub>2</sub> „ „    | 220 „        |
| 13. T. Williams .....                    | 6 <sup>1</sup> / <sub>4</sub> „ „    | 205 „        |
| 14. T. E. Spencer .....                  | 5 „ „                                | 200 „        |
| 15. Carter, Gummow, & Co.....            | For lump sum of £15,500              | 160 „        |

ROBERT HICKSON,  
Vice-President of Tender Board.

No. 4.

No. 4.  
Report by Board of Reference.

Board of Reference.—Tenders for Contract No. 77, Main Northern Sewer, Annandale and Leichhardt Sections.

THE tenders for this work were submitted to the Board to-day. In doing so, Mr. Hickson pointed out that fifteen tenders had been received, the lowest being that of Carter, Gummow, & Co., at 28½ per cent. below schedule rates—amounting approximately to £15,757 ls. 9d. The same firm also submitted a lump sum tender for carrying out the work, according to a plan sent in by them, for the sum of £15,500. The plan submitted is for constructing the work on the "Monier" arch principle. This system has been extensively used during recent years on the Continent of Europe with successful results, and Mr. Hickson sees no reason why, under certain restrictions, the opportunity should not be taken to introduce the system in the public works of this Colony. The advantages claimed by the patentees are that works can be carried out at a much cheaper rate wherever this method of construction is used. Mr. Hickson said he had no doubt that the design submitted was thoroughly suitable and likely to be effective, and as the main principles as regards size and inclination of sewer were as provided for in the Departmental design, he was prepared to recommend it; but if it was decided to accept the tender, a short specification of the work should be included in the bond, and provision also made for the maintenance of the work by the contractors for a certain period after completion.

Mr. Hickson further said, that as Mr. Darley would be the responsible officer for carrying out this work, he had gone into the matter very thoroughly with that gentleman, and Mr. Darley was quite prepared to endorse his views.

The Board, in view of the fact that Messrs. Darley and Hickson are satisfied that the principle is a sound one, and that the adoption of the plan will result in considerable economy, are prepared to endorse the recommendation of these gentlemen, and now submit the matter for the Minister's consideration.

J. BARLING,  
Chairman.  
C. W. DARLEY,  
Engineer-in-Chief, Harbours and Rivers.  
ROBERT HICKSON,  
Commissioner for Roads.  
H. DEANE,  
Engineer-in-Chief, Railway Construction.  
W. L. VERNON,  
Government Architect.

J. W. HOLLIMAN, Secretary,  
20 March, 1895.

Submitted.—J.B., 27/3/95. Before approving of this proposal I should like an estimate of the actual value of the work to be carried out by the contractors under the substituted scheme.—J.H.Y., 27/3/95. Mr. Hickson.—J.B., 28/3/95.

To comply fully with the Minister's minute would mean the taking out of quantities in the plan submitted by Messrs. Carter and Gummow. This would take at least a week to do. I think, however, I can answer sufficiently for the Minister to come to a decision. When plans were being prepared for the extension of the sewers on to the sewage farm, estimates were made for the work on the Monier system, as well as on the Department's designs. The result was that the estimate of both works was practically the same. Applying that comparison to this case, it would mean that the Departmental estimate for the work under consideration would be £22,000.—ROBERT HICKSON, 28/3/95. Under Secretary.

Submitted.—J. BARLING, 28/3/95. This is quite sufficient for me, and I now approve of the recommendation of the Board being carried out.—J.H.Y., 29/3/95. Accept.—D.C.McL. (*pro* U.S.), 29/3/95.

No. 5.

Messrs. Carter, Gummow, & Co. to The Secretary for Public Works.

Sir,

North Sydney, 4 April, 1895.

We have the honor to draw your attention to the conditions upon which the acceptance of our tender depends for Contract No. 77, Balmain Sewerage Works, and to our conversation with you of even date in connection with security required for its due performance.

We respectfully submit that our personal sureties for the amount necessary should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work.

We are a firm of sound financial standing, well and favourably known to your Department as contractors for many large and important contracts extending over a period of eight or nine years under the Departments of Harbours and Rivers, and Roads, Bridges, and Sewerage, which facts we trust will satisfy you as to our *bona-fides* in this matter.

We have, &c.,  
CARTER, GUMMOW, & CO.

No. 6.

The Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage to The Under Secretary for Public Works.

Sydney, 5 April, 1895.

THE accompanying letter of 4th April, 1895, from Messrs. Carter, Gummow, & Co., is a protest against the stringent supplementary specification prepared by Mr. Norrie, at my suggestion, with regard to the alteration in the design of Contract No. 77.

The last paragraph of this specification states: "And the contractors shall enter into a bond to Her Majesty the Queen in the penal sum of £12,000, with two sufficient sureties in the penal sum of £6,000 each, to secure the removal of so much of the said works as shall have been constructed on the Monier system, &c., &c."

The amount of £12,000 is the sum it would cost the Department, at Departmental rates, to renew that portion of this sewer which is built on the Monier system.

It is right, however, to say, that the tendered rates for this portion of the work would only come to £9,000, but prices being abnormally low, I think it is only right to put in a sum at which the Department really values the work.

Messrs. Carter and Gummow ask that their own "personal sureties for the amount named," *i.e.*, £12,000 (an amount which they do not dispute), "should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work."

They go on to say that they are "a firm of sound financial standing, well and favourably known to the Department as contractors." This is quite true. They are a firm in which I have every confidence. They have done a great deal of work under me, and I can testify that their aim always has been to turn out the very best class of work possible. At the same time, misfortunes happen the very soundest firms of contractors, and the Department must look a little way into the future. Their own bond of £12,000 would be really of no use if they were unfortunate enough in the meantime to become bankrupt.

I think, therefore, it is right that the sureties should be insisted upon. They give the names of two men, Mr. George Forrest and Mr. James Gillan. From inquiries made, I believe these men to be financially sound, and I think, if their names were accepted as the sureties in the penal sum of £6,000 each, the Department would be secured as far as it is reasonably possible to be.

This work will be carried out under Mr. Darley, and I recommend that the whole of the papers be sent him to give his opinion thereon.

ROBERT HICKSON.

Mr. Darley for report.—J.B., 5/4/95.

I concur with Mr. Hickson. I think in accepting a new patent of this kind, and adopting it in a large and costly contract, that the Department cannot be too careful in securing its position by leaving all the risk in the hands of the contractors and patentees. I, therefore, recommend that the personal names be required for further security. The names mentioned may, I think, be accepted.—C.D., Engineer-in-Chief, Metropolitan Sewerage Construction, 8/4/95.

For Minister's approval as to course suggested in regard to sureties.—J. BARLING, Under Secretary, 9/4/95. Approved.—J.H.Y., 10/4/95. Mr. Norrie.—J.No. P., 10/4/95. Messrs. Carter, Gummow, & Co., Auditor-General, Mr. Norrie, 11/4/95.

## No. 7.

## Purchase of Messrs. Carter, Snodgrass, and Baltzer's Patent.

THE patent herein referred to is, I believe, based upon the "System Monier." Monsieur Monier was the proprietor of a garden near Paris, who, in endeavouring to construct large and durable flower pots of cement mortar, which enclosed a frame of wire netting, detected the extraordinary strength of this material as compared with cement only, and in this manner speedily developed this system in manufacturing and constructing upon the same principle—bridges, roofs, gas and water tanks, ceilings, walls, &c., until the extraordinary strength of the Monier material became gradually very favourably known. Messrs. G. A. Wayfs & Co., in Berlin and Leipzig, are the patentees for Germany. They manufacture from the "Monier material," floors, wells, tanks, arched ceilings, roofs, bridges, stairs, pipes, columns, &c., in such a manner and to such an extent that the Monier system has been very creditably mentioned in the proceedings of the Association of Engineers in Germany since early in 1888.

The Monier construction system has been founded and developed by experiments on natural scale (which have been carefully watched by this Department for some years) and can only be carried on by persons trained in the works, or trained by experiments under the guidance of initiated persons. It should therefore be introduced here in a manufactory, and by an agent of the company experienced in the work, who should be in a position to offer the manufactured articles at their prices, subject to any tests which the authorities might deem necessary to enforce.

As regards the patent offered by Messrs. Carter, Snodgrass, and Baltzer, I have not had the opportunity of examining it to discover in what way it differs from the "Monier patent," nor do I know if the Monier system has been patented in this Colony. If it has not, I presume it is free to public use, as it has been known in the Colony for some years.

The patentees might be requested to furnish a copy of their patent, with drawings and calculations of strength, so that further examination of its merits may be made.

C. H. OHLFSEN BAGGE, 7/4/93.

Ask one of the firm to see me.—R.H., 10/4/93.

Carter & Co. informed.—F.C.P., 11/4/93.

I find Messrs. Carter & Co. have patented in Australia "Monier's patent concrete arch." This arch has been under my consideration for some time, long before it was patented here, and as soon as funds are available I have arranged for the erection of a small culvert on this principle, without a patent fee. In any case I could not recommend compliance with this request. A small fee per bridge might be granted if it is found desirable to erect any more on this design.—R.H., 12/4/93.

List to so inform.—J.B., 17/4/93. Approved by Minister.—W.J.L. Order No. 1,225.—D.C.M'L., 24/4/93. Inform.—J.B., 24/4/93. A. Armstrong, Esq., 28/4/93. Will Mr. Hickson kindly see me about this at his convenience.—J.B., 8/5/93. Put away for the present.—R.H., 16/6/93.

## Appendix No. 10.

Divisional Engineer.—August, 1894.—Metropolitan Division.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 18 July, 1894.

Minute Paper.

Subject:—"Monier System of Concrete Arching."

THE Monier system of concrete arching has been patented in the Colony by Messrs. Carter & Co. Where applicable, it reduces the cost of spanning an opening by about 50 per cent.

The patentees are willing to allow the Department to use the patent on payment of a royalty of 15 per cent. on the cost of the arch. I recommend this for the Minister's approval.

I might state I have just completed (with the permission of the patentees) a culvert on the Parramatta Road, built on this principle, with most satisfactory results, financially and otherwise.

ROBT. HICKSON.

Mr. Hickson's recommendation approved.—J.H.Y., 6/8/94.

## Appendix No. 11.

Divisional Engineer.—2 July, 9.—Metropolitan Division.

Sir, Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 2 February, 1894.

Referring to our conversation *re* the use of our patent system of bridge and culvert building, we hereby inform you that the royalty we require for the use of the same by your Department will be 15 per cent. on the cost of construction.

We are, &c.,

CARTER & CO.

## Appendix No. 12.

Department of Public Works, Engineer-in-Chief for Metropolitan Sewerage Construction,  
341, Pitt-street, Sydney, 9 September, 1895.

Contract 77.

WILL the Engineer-in-Chief kindly approve the accompanying schedule of prices for use in preparing progress vouchers in this contract, the price for which is "lump sum"?

It will be observed that quantities are slightly altered from original. This has been done in order to provide for "Monier" work, which has been substituted for brickwork.

T. GRIFFITHS,

Supervising Engineer, Metropolitan Sewerage Construction.

Engineer-in-Chief, Metropolitan Sewerage Construction.

CONTRACT No. 77.

This is the Schedule of Quantities and Prices hereinbefore referred to.

| No. of Item. | Description of Works.   | Unit.      | Probable Quantity. | Rate per Unit. |
|--------------|---|------------|--------------------|----------------|
|              | Excavation in open trenches in more or less hard materials, and in hard rock, for foundations of abutment-piers, and piers of arches of aqueducts, main sewers, retaining walls, gullies, seats of embankments for road deviations, road cuttings, storm-water overflow and storm-water discharge and other pipe-sewers, &c., including removing, pitching, masonry, brick or concrete work, drains, &c., met with in excavations as specified in clauses 3, 4, 6, 10, and 21:— |            |                    | £ s. d.        |
| 1            | Excavations in road surfaces, soil, sand, loam, clay, ironstone, soft rock only .....   | cubic yard | 4,243              | 0 2 0          |
| 2            | Excavation in hard rock where charges of powder 2 in. in length x 1½ in. in diameter, and such depth of bore-holes as shall be directed only are permitted .....  | "          | 140                | 0 7 0          |
| 3            | Excavation in hard rock where charges of powder 4 in. in length x 1½ in. in diameter, and such depths of bore-holes as shall be directed only are permitted .....   | "          | 1,160              | 0 6 0          |

| No of Item | Description of Work   | Unit        | Probable Quantity | Rate per Unit |
|------------|---|-------------|-------------------|---------------|
|            |   |             |                   | £ s d.        |
| 4          | Excavation in tunnels in solid rock for main and branch sewers, junctions, subducts, curves, &c as specified in clauses 3, 4, 10, and 21 —  | cubic yard  | 90                | 3 5 0         |
| 5          | Excavation in hard rock where guttering and gadding only is permitted   | "           | 100               | 3 0 0         |
| 6          | Excavation in hard rock where charges of powder 2 in in length x 1½ in in diameter, and such depth of bore holes as shall be directed only are permitted  | "           | 1,000             | 2 17 6        |
| 7          | Excavation in more or less hard materials and in solid rock, in shafts and shaft chambers, as specified in clauses 3, 6, 10, and 21 —   | "           | 70                | 0 6 0         |
| 8          | Excavation in road surfaces, loam, ironstone, shale, and soft rock only   | "           | 4                 | 1 2 6         |
| 9          | Excavation in hard rock where charges of powder 2 in in length by 1½ in in diameter, and such depth of boreholes as shall be directed only are permitted  | "           | 70                | 1 0 0         |
| 10         | Excavation in hard rock where guttering and gadding only is permitted   | "           | 2                 | 1 10 0        |
| 11         | Filling in at sides, round and over all concrete and brickwork of main sewer in open cutting round manhole shafts, chambers, retaining walls, gullies, round abutment piers, and piers of arches of aqueducts, round all pipe-sewers in tunnels and open trenches, into embankments for road deviations, including all sand-filling over main sewer between parapets of aqueducts and in tunnels, restoring all road and other surfaces, trimming, &c, as specified in clauses 5, 6, 10, and 21 | "           | 2,300             | 0 1 0         |
| 12         | Tarred metal deck over sand filling between parapet walls of aqueducts, and where ordered, complete, including all screenings, hot coal tar coatings, &c, as specified in clause 9  | "           | 95                | 2 8 0         |
| 13         | Sandstone ballast provided, placed in position, and spread 8 in. thick on road formation, 3 feet thick ballast-packing between heads of piles when directed and where ordered, as specified in clause 8   | "           | 740               | 0 4 0         |
| 14         | Bluestone road metal provided, placed in position, and spread 4 in thick on road formations, and where ordered, as specified in clause 8  | "           | 370               | 0 12 0        |
| 15         | Bluestone screenings provided, placed in position, and spread over road formations, as specified in clause 8  | "           | 180               | 0 5 0         |
| 16         | Subducts in more or less hard materials, when ordered, of glazed stone ware pipe of 6 in internal diameter, provided and executed as specified in clause 4  | lineal yard | 50                | 0 1 6         |
| 17         | Timber ordered in writing to be left in excavations, as specified in clause 6, including all iron used in fixing same   | cubic foot  | 300               | 0 1 8         |
| 18         | Supplying and fixing hardwood round timber in piles, where ordered, including providing and fixing all iron shoes and other ironwork used in driving same   | lineal foot | 960               | 0 4 0         |
| 19         | Sandstone concrete, in any situation, in any shape, form, or thickness, as specified in clauses 10, 11, and 21  | cubic yard  | 2,350             | 1 8 0         |
| 20         | Bluestone concrete, in any situation, in any shape, form, or thickness, as specified in clauses 10, 11, and 21  | "           | 530               | 2 10 0        |
| 21         | Special bluestone concrete in inner lining of sewers (between brick facings) of aqueducts, including providing, placing in position, and walling in of iron bond rods, as specified in clauses 10, 11, and 21   | "           | 1,000             | 3 0 0         |
| 22         | Brickwork in cement in facings, arches, circular panels, pilasters corbels, piers, spandrels, parapets, of specially selected white and red bricks, in sewer linings, and in any situation, as specified in clauses 2, 10, 13, and 21   | "           | 2,020             | 2 10 0        |
| 23         | Cement facing, 1 to 2, in any situation where ordered, as specified in clause 12  | sq yard     | 2,960             | 0 2 3         |
| 24         | Special cement facing, 1 to 1, to all internal surfaces of concrete lining of sewers over aqueducts, as specified in clause 12  | "           | 2,750             | 0 2 6         |
| 25         | Pymont bottom black sandstone ashlar, set in cement, in skewbacks to arches over Nelson and White Streets, to string courses and copings of aqueducts, in stop blocks at ends of aqueducts, and in any situation where ordered, as specified in clauses 2, 10, 14, and 21   | cubic foot  | 13,250            | 0 3 6         |
| 26         | Freestone ashlar set in cement in steps along lines of raised footpaths as specified in clauses 2, 10, 14, and 21   | "           | 130               | 0 3 0         |
| 27         | Supply and set in position freestone curbing as specified in clause 17  | lineal foot | 650               | 0 2 6         |
| 28         | Supply and set freestone gully covers, where ordered, as specified in clause 17   | each        | 4                 | 0 18 6        |
| 29         | Supply, place in position, and set in cement, slate covers over cistern heads of scupper pipes on lines of aqueducts, as specified in clause 19   | "           | 40                | 0 2 0         |
| 30         | Supply and set round manhole covers, and where ordered, squared bluestone pitchers, as specified in clause 15   | sq yard     | 8                 | 0 12 6        |
| 31         | Squared freestone pitchers to be supplied and set in any situation, 6 in deep, as specified in clause 16  | "           | 320               | 0 8 0         |
| 32         | Supply and fix two rail ordnance fencing, complete with all ironwork, painting, and tarring, as specified in clause 7   | rod         | 50                | 0 18 0        |
| 33         | Supply and fix, where ordered, hardwood, split, two-rail and wire fence, as specified in clauses 212 to 220 of the schedule to specification  | "           | 100               | 0 8 0         |
|            | Providing laying, and jointing glazed stoneware plain, junction and bend pipes in trenches, shafts, &c, including providing and fixing discs complete, as specified in clause 18, as viz —  |             |                   |               |
| 34         | 24 in diameter storm water overflow pipes   | lineal yard | 120               | 1 13 0        |
| 35         | 12-in diameter vertical drop pipes from weir chambers   | "           | 20                | 0 6 9         |
| 36         | 9-in diameter pipes in shafts   | "           | 15                | 0 5 0         |
| 37         | 4-in diameter scupper pipes   | "           | 64                | 0 1 6         |

| No. of Item. | Description of Works.   | Unit.       | Probable Quantity. | Rate per Unit. |       |
|--------------|---|-------------|--------------------|----------------|-------|
|              | Removal of surplus materials from all excavations as specified in clauses 98 to 100 of the schedule to specification as viz. :—   |             |                    | £              | s. d. |
| 38           | For the first half mile of lead .....   | cubic yard  | 4,580              | 0              | 0 9   |
| 39           | For every further quarter of a mile of lead .....   | "           | 4,580              | 0              | 0 4   |
| 40           | Receiving, fixing, and jointing any metal-work, as cast-iron frames with manhole coverings or gully gratings, gas-check frames, galvanised wrought-iron step-irons, &c., supplied by Government at the site of the works, as specified in clause 20 .....   |             |                    |                |       |
| 41           | Flap-traps, providing, delivering, and building in, including providing and fixing discs.....   | cwt. ....   | 125                | 0              | 4 0   |
| 42           | Permanent puddle, where ordered in any situation in the construction of these works (temporary puddle ordered for the purposes of execution of work not be paid for), as specified in clause 22 of the schedule to specification, including spreading in 9-in. layers and ramming, complete ..... | each ....   | 10                 | 1              | 5 0   |
| 43           | Special bluestone concrete, in any situation, as specified in clause 11 .....   | cubic yard  | rate only          | 0              | 10 0  |
| 44           | Bluestone metal (clause 11), 1½-in. gauge, stacked .....  | "           | "                  | 3              | 0 0   |
| 45           | Sandstone metal (clause 11), 2-in gauge, stacked .....  | "           | "                  | 0              | 13 0  |
| 46           | Bluestone metal (clause 8), 2½-in. gauge, stacked.....  | "           | "                  | 0              | 4 0   |
| 47           | Sharp, clean, washed sand (clause 2), stacked .....   | "           | "                  | 0              | 12 0  |
| 48           | Sawn hardwood, in scantlings or planks (clause 2) .....   | "           | "                  | 0              | 7 6   |
| 49           | Sawn hardwood, in scantlings or planks (clause 2) .....   | cubic foot. | "                  | 0              | 3 0   |
| 50           | Oregon timber, in scantlings or planks .....  | "           | "                  | 0              | 3 0   |
| 51           | Wrought-iron, in bolts, screws, nails, spikes, straps, &c. (clause 2) .....   | lb. ....    | "                  | 0              | 0 4   |
| 52           | Portland cement (clause 2) .....  | cask ..     | "                  | 0              | 13 0  |
| 53           | Artizan or mechanic, supplied by Contractor.....  | day ....    | "                  | 0              | 11 0  |
| 54           | Quarryman or other skilled labourer, supplied by Contractor .....   | "           | "                  | 0              | 10 0  |
| 55           | Ordinary labourer, supplied by Contractor .....   | "           | "                  | 0              | 8 0   |
| 56           | Cart, with one horse and driver, supplied by Contractor.....  | "           | "                  | 0              | 11 0  |
| 56           | One additional horse, supplied by Contractor .....  | "           | "                  | 0              | 5 6   |

The quantities are not guaranteed as correct, and are merely for the guidance of Tenderers, being subject to omissions, deductions, alterations, and additions.

All work herein enumerated shall be understood as being placed in position where specified and ordered, and in complete working condition, in accordance with the specification.

The above schedule prices include, in every case, continual maintenance of the works during the whole time of construction, and up to the day of their being formally taken over by the Engineer.

Prices for items Nos. 52, 53, 54, 55, and 56 are to be for such as are able-bodied and efficient. The schedule rates per day are for the day of eight hours. In the event of overtime and night-work being ordered, it is to be paid for at 25 per cent. advance on the time rates set down for day-work.

The whole of the foregoing prices to include all labour, tools, implements, plant, machinery, shoring, timbering, centering, concrete boxes, unwatering, coffer-dams, fluming, temporary bridges, roads, pumping, gasket filling, diverting water-courses and surface water, diverting and maintaining the traffic along roads crossing over pipe-sewers, disposal and removal of surplus materials on completion of contract, reinstating all roads and other surfaces, &c., and any other thing necessary in executing and completing each respective item, in accordance with plans and specification.

## CONTRACT No. 77.

This is the Schedule of Quantities and Prices hereinbefore referred to.

(The printing in heavier type indicates additions and alterations to original Schedule).

| No. of Item. | Description of Works.   | Unit.      | Probable Quantity. | Rate per Unit. |                  |
|--------------|---|------------|--------------------|----------------|------------------|
|              | Excavation in open trenches in more or less hard materials, and in hard rock, for foundations of abutment-piers, and piers of arches of aqueducts, main sewers, retaining walls, gullies, seats of embankments for road deviations, road cuttings, storm-water overflow and storm-water discharge and other pipe-sewers, &c., including removing pitching, masonry, brick or concrete work, drains, &c., met with in excavations as specified in clauses 3, 4, 6, 10, and 21 :— |            |                    | £              | s. d.            |
| 1            | Excavation in road surfaces, soil, sand, loam, clay, ironstone, soft rock only .....  | cubic yard | 4,244              | 0              | 2 0 — 424 8 0    |
| 2            | Excavation in hard rock where charges of powder 2 in. in length x 1½ in. in diameter, and such depths of bore-holes as shall be directed only are permitted .....   | "          | 140                | 0              | 7 0 — 49 0 0     |
| 3            | Excavation in hard rock where charges of powder 4 in. in length x 1½ in. in diameter, and such depths of bore-holes as shall be directed only are permitted .....   | "          | 1,160              | 0              | 6 0 — 348 0 0    |
| 4            | Excavation in tunnels in solid rock for main and branch sewers, junctions, subducts, curves, &c., as specified in clauses 3, 4, 10, and 21 :—   |            |                    |                |                  |
| 5            | Excavation in hard rock where guttering and gadding only is permitted .....   | "          | 90                 | 3              | 5 0 — 292 10 0   |
| 6            | Excavation in hard rock where charges of powder 2 in. in length x 1½ in. in diameter, and such depth of bore-holes as shall be directed only are permitted .....  | "          | 100                | 3              | 0 0 — 300 0 0    |
| 6            | Excavation in hard rock where charges of powder 4 in. in length by 1½ in. in diameter, and such depth of bore-holes as shall be directed only are permitted .....   | "          | 1,000              | 2              | 17 6 — 2,875 0 0 |
| 7            | Excavation in more or less hard materials and in solid rock, in shafts and shaft-chambers, as specified in clauses 3, 6, 10, and 21 :—  |            |                    |                |                  |
| 8            | Excavation in road surfaces, loam, ironstone, shale, and soft rock only...  | "          | 20                 | 0              | 6 0 — 6 0 0      |
| 8            | Excavation in hard rock where charges of powder 2 in. in length by 1½ in. in diameter, and such depth of bore-holes as shall be directed only are permitted .....   | "          | 4                  | 1              | 2 6 —            |
| 9            | Excavation in hard rock where charges of powder 4 in. in length by 1½ in. in diameter, and such depth of bore-holes as shall be directed only are permitted .....   | "          | 55                 | 1              | 0 0 — 55 0 0     |
| 10           | Excavation in hard rock where guttering and gadding only is permitted .....   | "          | 2                  | 1              | 10 0 —           |

| No. of Item. | Description of Works.  | Unit        | Probable Quantity | Rate         | n t       |
|--------------|--|-------------|-------------------|--------------|-----------|
| 11           | Filling in at sides, round and over all concrete and brickwork of main sewer in open cutting round manhole shafts, chambers, retaining walls, gullies, round abutment piers, and piers of arches of aqueducts, round all pipe-sewers in tunnels and open trenches, into embankments, for road deviations, including all sand-filling over main sewer between parapets of aqueducts and in tunnels, restoring all road and other surfaces, trimming, &c, as specified in clauses 5, 6, 10, and 21 | cubic yard  | 2,300             | 0 1 0        | 115 0     |
| 12           | Tarred metal deck over sand filling between parapet walls of aqueducts and where ordered, complete, including all screenings, hot coal-tar coatings, &c., as specified in clause 9   | "           | 95                | 2-8-0        |           |
| 13           | Sandstone ballast provided, placed in position, and spread 8 in. thick on road formation, 3 feet thick ballast-packing between heads of piles when directed and where ordered, as specified in clause 8  | "           | 740               | 0 4 0        | 148 0 0   |
| 14           | Bluestone road metal provided, placed in position, and spread 4 in. thick on road formations, and where ordered, as specified in clause 8  | "           | 370               | 0 12 0       | 222 0 0   |
| 15           | Bluestone screenings provided, placed in position, and spread over road formations, as specified in clause 8   | "           | 180               | 0 5 0        | 45 0 0    |
| 16           | Subducts in more or less hard materials, when ordered, of glazed stoneware pipe of 6 in. internal diameter, provided and executed as specified in clause 4   | lineal yard | 50                | 0 1 6        | 3 15 0    |
| 17           | Timber ordered in writing to be left in excavation, as specified in clause 6, including all iron used in fixing same   | cubic foot  | 300               | 0 1 8        | 25 0 0    |
| 18           | Supplying and fixing hardwood round timber in piles, where ordered, including providing and fixing all iron shoes and other ironwork used in driving same  | lineal foot | 960               | 0 4 0        | 192 0 0   |
| 19           | Sandstone concrete, in any situation, in any shape, form, or thickness, as specified in clauses 10, 11, and 21   | cubic yard  | 1,800             | 1 8 0        | 2,520 0 0 |
| 20           | Bluestone concrete, in any situation, in any shape, form, or thickness, as specified in clauses 10, 11, and 21   | "           | 300               | 2 10 0       | 750 0 0   |
| 21           | Special bluestone concrete in inner lining of sewers (between brick facings) of aqueducts, including providing, placing in position, and walling in of iron bond rods, as specified in clauses 10, 11, and 21  | "           | 1,050             | 3 10 0       | 3,675 0 0 |
| 22           | Brickwork in cement in facings, arches, circular panels, pilasters, corbels, piers, spandrels, parapets, of specially selected white and red bricks, in sewer linings, and in any situation, as specified in clauses 2, 10, 13, and 21   | "           | 150               | 2 10 0       | 375 0 0   |
| 23           | Cement facing, 1 to 2, in any situation where ordered, as specified in clause 12   | sq. yard    | 12,000            | 0 2 3        | 1,350 0 0 |
| 24           | Cast-iron plates, &c. Special cement facing, 1 to 1, to all internal surfaces of concrete lining of sewers over aqueducts, as specified in clause 12   | tons        | 12                | 11 3 0       | 133 16 0  |
| 25           | Tie-bars, channel iron, &c. &c. Pyrmont bottom-block sandstone ashlar, set in cement, in skewbacks to arches over Nelson and White Streets, to string courses and copings of aqueducts, in stop-blocks at ends of aqueducts and in any situation where ordered, as specified in clauses 2, 10, 14, and 21  | sq. yard    | 2,750             | 0-2-6        |           |
| 26           | 3-in. and 4-in. iron rods, bedded in cement mortar   | tons        | 22                | 15 0 0       | 330 0 0   |
| 27           | Freestone ashlar set in cement in steps along lines of raised footpaths as specified in clauses 2, 10, 14, and 21  | cubic foot  | 13,250            | 0 3 6        |           |
| 28           | Supply and set in position freestone curbing as specified in clause 17   | tons        | 44                | 10 0 0       | 440 0 0   |
| 29           | Supply and set freestone gully covers, where ordered, as specified in clause 17  | lucal foot  | 650               | 0 2 6        | 81 5 0    |
| 30           | Supply, place in position, and set in cement, slate-covers over cistern heads of scupper-pipes on lines of aqueducts, as specified in clause 19  | each        | 4                 | 0 18 6       | 3 14 0    |
| 31           | Supply and set round manhole covers, and where ordered, squared bluestone pitchers, as specified in clause 15  | "           | 40                | 0 2 0        | 4 0 0     |
| 32           | Squared freestone pitchers to be supplied and set in any situation, 6 in deep, as specified in clause 16   | sq yard     | 8                 | 0 12 6       | 5 0 0     |
| 33           | Supply and fix two-rail ordnance fencing, complete with all ironwork, painting and tarring, as specified in clause 7   | "           | 320               | 0 8 0        | 128 0 0   |
| 34           | Supply and fix, where ordered, hardwood, split, two-rail and wire fence as specified in clauses 212 to 220 of the schedule to specification  | rod         | 50                | 0 18 0       | 45 0 0    |
| 35           | Providing laying, and jointing glazed stoneware plain, junction, and bend pipes in trenches, shafts, &c., including providing and fixing discs complete, as specified in clause 18, as viz. —  | "           | 100               | 0 8 0        | 40 0 0    |
| 36           | 24-in. diameter storm water overflow pipes   | lineal yard | 120               | 1 13 0       | 198 0 0   |
| 37           | 12-in. diameter vertical drop-pipes from weir chambers   | "           | 20                | 0 6 9        | 6 15 0    |
| 38           | 9-in. diameter pipes in shafts   | "           | 15                | 0 5 0        | 3 15 0    |
| 39           | 4-in. diameter scupper-pipes   | "           | 64                | 0 1 6        | 4 16 0    |
| 40           | Removal of surplus materials from all excavations, as specified in clauses 98 to 100 of the schedule to specification as viz. —  | "           |                   |              |           |
| 41           | For the first half mile of lead  | cubic yard  | 4,584             | 0 0 9        | 171 18 0  |
| 42           | For every further quarter of a mile of lead  | "           | 4,584             | 0 0 4        | 76 8 0    |
| 43           | Receiving, fixing, and jointing any metal-work, as cast-iron frames with manhole coverings or gully gratings, gas-check frames, galvanised wrought-iron step-irons, &c., supplied by Government at the site of the works, as specified in clause 20  | cwt.        | 125               | 0 4 0        | 25 0 0    |
| 44           | Flap-traps, providing, delivering, and building in, including providing and fixing discs   | each        | 10                | 1 5 0        | 12 10 0   |
| 45           | Permanent puddle, where ordered in any situation in the construction of these works (temporary puddle ordered for purposes of execution of work not to be paid for), as specified in clause 22 of the schedule to specification, including spreading in 9-in. layers and ramming complete  | cubic yard  | rate only         | 0 10 0       |           |
| 46           | Special bluestone concrete, in any situation, as specified in clause 11  | "           | "                 | 3 0 0        |           |
| 47           | Bluestone metal (clause 11), 1½-in. gauge, stacked   | "           | "                 | 0 13 0       |           |
| 48           | Sandstone metal (clause 11), 2-in. gauge, stacked  | "           | "                 | 0 4 0        |           |
| 49           | Bluestone metal (clause 8), 2½-in. gauge, stacked  | "           | "                 | 0 12 0       |           |
|              |  |             |                   | £ 15,500 0 0 |           |



| No. of Item. | Description of Works.   | Unit.       | Probable Quantity. | Rate per Unit.   |
|--------------|---|-------------|--------------------|------------------|
| 47           | Sharp, clean, washed sand (clause 2), stacked .....                         | cubic yard  | rate only ...      | £ s. d.<br>0 7 6 |
| 48           | Sawn hardwood, in scantlings or planks (clause 2) .....                     | cubic foot. | " .....            | 0 3 0            |
| 49           | Oregon timber, in scantlings or planks .....                                | "           | " .....            | 0 3 0            |
| 50           | Wrought-iron, in bolts, screws, nails, spikes, straps, &c. (clause 2) ..... | lb. "       | " .....            | 0 0 4            |
| 51           | Portland cement (clause 2) .....  | cask        | " .....            | 0 13 0           |
| 52           | Artizan or mechanic, supplied by Contractor .....                           | day         | " .....            | 0 11 0           |
| 53           | Quarryman or other skilled labourer, supplied by Contractor .....           | "           | " .....            | 0 10 0           |
| 54           | Ordinary labourer, supplied by Contractor .....                             | "           | " .....            | 0 8 0            |
| 55           | Cart, with one horse and driver, supplied by Contractor .....               | "           | " .....            | 0 11 0           |
| 56           | One additional horse, supplied by Contractor .....                          | "           | " .....            | 0 5 6            |

The quantities are not guaranteed as correct, and are merely for the guidance of Tenderers, being subject to omissions, deductions, alterations, and additions.

All work herein enumerated shall be understood as being placed in position where specified and ordered, and in complete working condition, in accordance with the specification.

The above schedule prices include, in every case, continual maintenance of the works during the whole time of construction, and up to the day of their being formally taken over by the Engineer.

Prices for items Nos. 52, 53, 54, 55, and 56 are to be for such as are able-bodied and efficient. The schedule rates per day are for the day of eight hours. In the event of overtime and night-work being ordered, it is to be paid for at 25 per cent. advance on the time rates set down for day-work.

The whole of the foregoing prices to include all labour, tools, implements, plant, machinery, shoring, timbering, centering, concrete boxes, unwatering, coffer-dams, fluming, temporary bridges, roads, pumping, gasket filling, diverting watercourses and surface water, diverting and maintaining the traffic along roads crossing over pipe-sewers, disposal and removal of surplus materials on completion of contract, reinstating all roads and other surfaces, &c., and any other thing necessary in executing and completing each respective item, in accordance with plans and specification.

CARTER, GUMMOW, & Co., Contractors for Contract No. 77. Progress Return, No. 9, showing quantity and value of work executed or fixed, and material advanced on, on the 12th day of May, 1896.

|                              |             |
|------------------------------|-------------|
| Estimated cost of work ..... | £15,500 0 0 |
| Progress payments .....      | £8,191 19 1 |
| Present advance .....        | 755 0 5     |
|                              | 8,946 19 6  |

| Schedule Rate No. | Description.                        | Unit.        | Quantity. | Rate. | Amount.            | Total.     |
|-------------------|-------------------------------------|--------------|-----------|-------|--------------------|------------|
| 1                 | Excavation in earth .....           | cubic yards  | 4,244     | 2/-   | £ s. d.<br>424 8 0 | £ s. d.    |
| 2                 | " " rock (2 in. powder) .....       | "            | 140       | 7/-   | 49 0 0             |            |
| 3                 | " " " 4 " " .....                   | "            | 1,160     | 6/-   | 348 0 0            |            |
| 6                 | " " tunnel .....                    | "            | 1,071     | 57/6  | 3,079 2 6          |            |
| 7                 | " " shafts in soil .....            | "            | 20        | 6/-   | 6 0 0              |            |
| 9                 | " " " (4 in. powder) .....          | "            | 65        | 20/-  | 65 0 0             |            |
| 11                | Filling in .....                    | "            | 700       | 1/-   | 35 0 0             |            |
| 13                | Sandstone ballast .....             | "            | 740       | 4/-   | 148 0 0            |            |
| 14                | Bluestone metal .....               | "            | 370       | 12/-  | 222 0 0            |            |
| 15                | Bluestone screenings .....          | "            | 75        | 5/-   | 18 15 0            |            |
| 18                | Supplying and fixing piles .....    | lineal feet  | 960       | 4/-   | 192 0 0            |            |
| 19                | Sandstone concrete .....            | cubic yards  | 1,388     | 28/-  | 1,943 4 0          |            |
| 20                | Bluestone " .....                   | "            | 146       | 50/-  | 365 0 0            |            |
| 21                | Special " .....                     | "            | 576       | 70/-  | 2,016 0 0          |            |
| 24A               | Channel iron and tie bars .....     | tons         | 4 t. 6 c. | 15/-  | 64 10 0            |            |
| 25A               | 3/4 in. and 1/2 in. iron rods ..... | "            | 14 1/2    | 10/-  | 147 10 0           |            |
| 27                | Freestone kerbing .....             | cubic feet   | 330       | 2/6   | 41 5 0             |            |
| 28                | " " gully covers .....              | each         | 4         | 18/6  | 3 14 0             |            |
| 31                | " " pitchers .....                  | lineal yards | 100       | 8/-   | 40 0 0             |            |
| 32                | Ordnance fencing .....              | rods         | 50        | 18/-  | 45 0 0             |            |
| 34                | 24 in. diameter pipes .....         | lineal yards | 90        | 33/-  | 148 10 0           |            |
| 35                | 12 " " .....                        | "            | 20        | 6/9   | 6 15 0             |            |
| 38                | Carting to spoil .....              | cubic yards  | 4,584     | -9    | 171 18 0           |            |
| 39                | " " further 1/4 mile .....          | "            | 4,584     | -4    | 76 8 0             |            |
|                   | Material on ground—cement .....     | cask         | 150       | 8/8   | .. ..              | 9,656 19 6 |
|                   |                                     |              |           |       |                    | 65 0 0     |
|                   | Total .....                         |              |           |       |                    | 9,721 19 6 |

### Appendix No. 13.

EXTRACT FROM *Hansard*, 19 MAY, 1896.

\* \* \* \* \*

Mr. REID: No, I do not think there was; because the hon. gentleman came to me to press this matter forward as one of great urgency, and gave me a reason for it, and I immediately summoned a Cabinet to meet that afternoon out of the regular time. That is the reason there was not a full Cabinet. I quite agreed with the hon. member that there should be no delay. We all know how witnesses are got out of the way if there is any time.

Mr. PARKES: I can tell you Mr. Hickson's son has gone!

Mr. REID: The hon. member will see that I recognise what he says.

Mr. YOUNG: The hon. gentleman made a very unfair imputation. He has been gone a month.

Mr. CRICK: How did the hon. gentleman know that?

Mr. YOUNG: I was told so yesterday?

Mr. REID: My hon. colleague would naturally ask about it, after all that has been said about it. Surely he is entitled to ask in his own Department.

Mr. PARKES: I hope the hon. member knows where he is?

Mr. YOUNG: I do not!

Mr. REID: If he went months ago, the hon. member has found a little mare's nest this time.

\* \* \* \* \*

Appendix No. 14.

CARTER, GUMMOW, & Co., contractors for Contract No. 69. Final return showing quantity and value of work executed or fixed on the 23rd day of October, 1895.

|                                      |              |
|--------------------------------------|--------------|
| Amount of contract .....             | £45,207 3 11 |
| Progress payments..... £52,100 0 0 } |              |
| Final payment .....                  | 54,320 7 7   |

| Schedule Rate No. | Description.                                  | Unit.       | Quantity.  | Rate.  | Amount.      | Total.      |
|-------------------|---|-------------|------------|--------|--------------|-------------|
| 1                 | Excavation in open trench.....                | cubic yard  | 19,230     | 9d.    | £ 721 2 6    | £ s. d.     |
| 8                 | " tunnel .....                                | "           | 7,661      | 27/6   | 10,533 17 6  |             |
| 11                | " .....                                       | "           | 6,712      | 27/6   | 9,229 0 0    |             |
| 12                | " shafts, soft .....                          | "           | 91         | 4/-    | 18 4 0       |             |
| 14                | " " hard .....                                | "           | 404        | 4/-    | 80 16 0      |             |
| 16                | " " more or less .....                        | "           | 539        | 40/-   | 1,078 0 0    |             |
| 19                | " " hard .....                                | "           | 84         | 5/-    | 21 0 0       |             |
| 20                | Filling.....                                  | "           | 17,200     | -/6    | 430 0 0      |             |
| 21                | Timber left in .....                          | cubic feet  | 9,818      | -/1    | 40 18 2      |             |
| 22                | Removing culverts .....                       | cubic yard  | 74         | 2/6    | 9 5 0        |             |
| 28                | Stone filling .....                           | "           | 329        | 1/-    | 16 9 0       |             |
| 29                | Blue-metal.....                               | "           | 132        | 10/-   | 66 0 0       |             |
| 30                | Sand .....                                    | "           | 66         | 2/6    | 8 5 0        |             |
| 31                | Sandstone concrete .....                      | "           | 1,031      | 40/-   | 2,062 0 0    |             |
| 32                | Bluestone " .....                             | "           | 4,844      | 43/-   | 10,414 12 0  |             |
| 33                | Brickwork .....                               | "           | 1,921      | 55/-   | 5,282 15 0   |             |
| 34                | Cement facing .....                           | square yard | 10,683     | 5/-    | 2,670 15 0   |             |
| 35                | Sandstone ashlar .....                        | cubic feet  | 60         | 5/-    | 15 0 0       |             |
| 36                | Bluestone pitchers .....                      | square yard | 36.50      | £50    | 1,825 0 0    |             |
| 38                | Ordinance fencing .....                       | rod         | 5          | 80/-   | 20 0 0       |             |
| 39                | 9-in. S.W. pipes .....                        | lineal yard | 32         | 2/-    | 3 4 0        |             |
| 40                | 12-in. " .....                                | "           | 31         | 3/-    | 4 13 0       |             |
| 41                | 16-in. stoneware pipes.....                   | "           | 11         | 6/-    | 3 6 0        |             |
| 42                | 18-in. " .....                                | "           | 2          | 10/-   | 1 0 0        |             |
| 43                | Surplus material .....                        | cubic yard  | 17,671     | -/3    | 220 17 9     |             |
| 45                | Fixing ironwork .....                         | ton         | 20         | 40/-   | 40 0 0       |             |
| 46                | C. I. penstock, 6 ft. diameter .....          | each        | 3          | £230   | 690 0 0      |             |
| 47                | " " 3 ft. 9 in. diameter .....                | "           | 2          | £140   | 280 0 0      |             |
| 48                | " " 2 ft. diameter .....                      | "           | 1          | £45    | 45 0 0       |             |
| 49                | " gas-check, 6 ft. 10 in. x 5 ft. 10 in. .... | "           | 1          | £75    | 75 0 0       |             |
| 50                | " " 6 ft. 8 in. x 5 ft. 8 in. ....            | "           | 1          | £70    | 70 0 0       |             |
| 51                | " " 5 ft. 6 in. x 4 ft. 6 in. ....            | "           | 1          | £45    | 45 0 0       |             |
| 52                | " " 5 ft. 2 in. x 4 ft. 2 in. ....            | "           | 1          | £40    | 40 0 0       |             |
| 53                | " " 5 ft. 1 in. x 4 ft. 1 in. ....            | "           | 1          | £40    | 40 0 0       |             |
| 54                | " F. and F. pipe, 3 ft. 9 in. diameter .....  | ton         | 2 2 3 4    | £16    | 34 4 7       |             |
| 55                | " F. and F. pipe, " .....                     | "           | 2 0 0 18   | £16    | 32 2 7       |             |
| 56                | " F. and S. pipe, " .....                     | "           | 1 6 3 13   | £16    | 29 9 10      |             |
| 57                | " S. pipe, " .....                            | "           | 2 5 3 23   | £16    | 36 15 3      |             |
| 58                | " thimble, " .....                            | "           | 0 11 3 20  | £16    | 9 10 10      |             |
| 59                | " F. pipe, 3 ft. 6 in. diameter.....          | "           | 4 12 2 2   | £16    | 74 0 3       |             |
| 60                | " F. and F. pipe, 3 ft. 6 in. diameter .....  | "           | 5 16 0 6   | £16    | 92 16 10     |             |
| 61                | " F. and S. pipe, " .....                     | "           | 4 9 2 2    | £16    | 71 12 3      |             |
| 62                | " S. pipe, " .....                            | "           | 2 2 3 25   | £16    | 34 7 6       |             |
| 63                | " S. pipe, " .....                            | "           | 1 7 3 20   | £16    | 22 6 10      |             |
| 64                | " F. and S. pipe, " .....                     | "           | 1 5 2 24   | £16    | 20 11 5      |             |
| 65                | " thimble " .....                             | "           | 1 0 2 14   | £16    | 16 10 0      |             |
| 66                | " F. and F. pipe, 2 ft. diameter.....         | "           | 0 19 0 4   | £16    | 15 4 7       |             |
| 67                | " F. and S. pipe, " .....                     | "           | 1 13 3 16  | £16    | 27 2 9       |             |
| 68                | " thimble, " .....                            | "           | 0 4 1 5    | £16    | 3 8 8        |             |
| 69                | " F. bend, 12 in. diameter .....              | "           | 0 14 1 0   | £16    | 11 8 0       |             |
| 70                | " F. and S. bend, 16 in. diameter .....       | "           | 0 8 1 10   | £20    | 8 6 10       |             |
| 71                | Wrought-iron girders .....                    | "           | 1 7 2 4    | £22    | 30 5 9       |             |
| 72                | Platform for penstocks .....                  | "           | 1 4 2 15   | £30    | 36 19 0      |             |
| 73                | C. I. standards and W. I. railways .....      | "           | 0 4 1 11   | £50    | 10 17 5      |             |
| 74                | W. I. ladders .....                           | "           | 0 16 2 15  | £30    | 24 19 0      |             |
| 75                | Landing plates .....                          | "           | 0 15 2 27  | £20    | 15 14 10     |             |
| 76                | W. I. gratings .....                          | "           | 0 4 1 20   | £30    | 6 12 10      |             |
| 77                | " " .....                                     | "           | 0 9 1 11   | £30    | 14 0 5       |             |
| 78                | C. I. pipes, 3 ft. 9 in. diameter.....        | "           | 289 4 0 0  | £8/15/ | 2,530 10 0   |             |
| 79                | " 3 ft. 6 in. diameter.....                   | "           | 435 5 0 14 | £8/15/ | 3,808 9 10   |             |
| 80                | " 2 ft. diameter .....                        | "           | 63 16 3 20 | £8/15/ | 558 13 1     |             |
| 81                | Screw-bolts .....                             | "           | 0 2 0 23   | £50    | 5 10 3       |             |
| 82                | " " .....                                     | "           | 0 0 1 26   | £50    | 1 4 1        |             |
| 83                | Laying, &c., 3 ft. 9 in. pipes.....           | lineal yard | 376        | 3/6    | 65 16 0      |             |
| 84                | Laying 3 ft. 6 in pipes .....                 | "           | 640        | 3/6    | 112 0 0      |             |
| 85                | " 2 ft. pipes.....                            | "           | 244        | 2/6    | 30 10 0      |             |
| 86                | Flap-traps .....                              | each        | 30         | 25/-   | 37 10 0      |             |
| 95                | Wrought-iron, galvanised .....                | cwt.        | 19         | 50/-   | 47 10 0      |             |
| 96                | Portland cement .....                         | cask        | 11         | 12/-   | 6 12 0       |             |
| 97                | Artisan .....                                 | day         | 47         | 16/-   | 37 12 0      |             |
| 99                | Ordinary labourer .....                       | "           | 119        | 11/-   | 65 9 0       |             |
| 100               | Cart, horse, and driver .....                 | "           | 27         | 20/-   | 27 0 0       |             |
|                   | Filling Western Branch .....                  | cubic yard  | 400        | 5/-    | 100 0 0      | 54,114 14 5 |
|                   | C. I. pipes for flushing .....                | ton         | 3 4 0 4    | 24/-   | 76 16 10     |             |
|                   | " " .....                                     | "           | 1 6 0 22   | 22/-   | 28 16 4      |             |
|                   | Total.....                                    |             |            |        | £ 54,320 7 7 | 205 13 2    |

## Appendix No. 15.

CONTRACT No. 77—"MONIER SYSTEM"—JUNE 4TH, 1896.

Quantities and estimated cost Johnstone's and White's Creek Aqueducts. Above footings. Total length of both Aqueducts, 30½ chains.

|   |                             | £      | s. | d. |
|---|-----------------------------|--------|----|----|
| Sandstone Concrete—   |                             |        |    |    |
| 852 cubic yards in piers=9 full piers, containing 2,556 cubic feet, each,—21s. ....         |                             | 894    | 12 | 0  |
| Blue-metal Concrete—  |                             |        |    |    |
| 682 cubic yards in piers, in spandrels of arches and base bottom of channel,—40s.....       |                             | 1,364  | 0  | 0  |
| Compo.—   |                             |        |    |    |
| In all arches.....  | 11,260 cubic feet.....      |        |    |    |
| Bottom channel, including plinths .....   | 2,896 " .....               |        |    |    |
| 1,084 cubic yards, top, including cornice and coping,                                       | 2,558 " .....               |        |    |    |
| Bottom angle corners .....  | 5,340 " .....               |        |    |    |
| Sides of channel .....  | 7,216 " .....               |        |    |    |
|   | 29,270 cubic feet,—30s..... | 1,626  | 0  | 0  |
| Ironwork—   |                             |        |    |    |
| 16,776 lb. in ¼" dia. side and top iron bars .....  |                             |        |    |    |
| 33,218 " in ⅜" " top cross-bars and side vertical bars .....                                |                             |        |    |    |
| 4,880 " in ¼" " cross-bars in arches .....  |                             |        |    |    |
| 11,200 " in ⅜" " longitudinal bars in arches=29 tons 9 cwt. 3 qrs. 22 lb (say) 30 tons,—£10 |                             | 300    | 0  | 0  |
| 34,100 " in Channel-plates drilled for ties .....   |                             |        |    |    |
| 1,788 " in ½" " top tie-rods with heads, threads, and nuts.....                             |                             |        |    |    |
| 2,012 " in ⅜" " bottom tie-rods .....   |                             |        |    |    |
| 4,000 " bolts and nuts=19 tons 12 cwt. 16 lb. (say) 20 tons,—£13 .....                      |                             | 260    | 0  | 0  |
| 12 tons cast-iron plates,—£10 .....   |                             | 120    | 0  | 0  |
| 12,000 sup. yds. cement rendering,—1s. 6d.....  |                             | 900    | 0  | 0  |
|   |                             | £5,464 | 12 | 0  |
| Cost per foot run.....  |                             | 2      | 13 | 3  |
| Cost per yard cube .....  |                             | 2      | 1  | 9  |

*Particulars showing how values have been estimated.*

|  |  |    |    |   |
|--|--|----|----|---|
| Sandstone Concrete—  |  |    |    |   |
| 5 yards sandstone,—2s. 6d.....   |  | 0  | 12 | 6 |
| 2 " crushed sandstone (sand),—2s. 6d.....  |  | 0  | 5  | 0 |
| 1 " = 6 casks of cement, per cask,—9s. 6d.....                                     |  | 2  | 17 | 0 |
| which makes 5 yards cube of concrete .....   |  | 3  | 14 | 6 |
| = 14s. 11d. per yard for material, 6s. 1d. per yard for labour, timbering, &c..... |  | 1  | 1  | 0 |
| Blue-metal Concrete—   |  |    |    |   |
| 7 yards blue-metal,—12s. ....  |  | 4  | 4  | 0 |
| 3 " crushed sandstone (sand),—2s. 6d.....  |  | 0  | 7  | 6 |
| 2 " cement = 12 casks, per cask,—9s. 6d.....                                       |  | 5  | 14 | 0 |
| which makes 7 yards cube of concrete .....   |  | 10 | 5  | 6 |
| = £1 9s. 4d. per yard material, 10s. 8d. per yard labour, boarding, &c.....        |  | 2  | 0  | 0 |
| Compo.—  |  |    |    |   |
| 3 yards sand,—2s. 6d.....  |  | 0  | 7  | 6 |
| 1 yard cement= 6 casks, per cask,—9s. 6d.....                                      |  | 2  | 17 | 0 |
| which makes 3 yards cube of compo. ....  |  | 3  | 4  | 6 |
| = £1 1s. 6d. per yard material, 8s. 6d. per yard labour, boarding, &c.....         |  | 1  | 10 | 0 |

CONTRACT No. 77—DEPARTMENTAL DESIGN—JUNE 5TH, 1896.

Quantities and estimated cost, Johnstone's and White's Creek Aqueducts. Above footings.

|   | £     | s. | d. |
|---|-------|----|----|
| Brickwork—  |       |    |    |
| 1,760 cubic yards double-pressed bricks,—40s. ....                    | 3,520 | 0  | 0  |
| Special Bluestone Concrete—   |       |    |    |
| 1,282 cubic yards. Round sewer,—40s. ....                             | 2,564 | 0  | 0  |
| Sandstone Concrete—   |       |    |    |
| 1,362 cubic yards piers and haunches of arches behind brick,—21s..... | 1,430 | 2  | 0  |
| 11,774 cubic feet Pyrmont ashlar,—3s. ....                            | 1,766 | 0  | 0  |
| 95 cubic yards tarred metal decking,—40s. ....                        | 190   | 0  | 0  |
| 2,662 superficial yards cement rendering,—1s. 6d. ....                | 199   | 13 | 0  |
| 130 cubic yards sand-filling,—1s.....                                 | 6     | 10 | 0  |
| 40 No. slate covers,—1s. 6d. ....                                     | 3     | 0  | 0  |
|   | 9,679 | 7  | 0  |
| Cost per foot run.....  | 4     | 16 | 2  |

CONTRACT No. 77—"MONIER SYSTEM"—JUNE 8TH, 1896.

Quantities and estimated cost, Johnstone's and White's Creek Aqueducts. Above footings. Departmental prices as per Schedule.

|   | £     | s. | d. |
|---|-------|----|----|
| 852 cubic yards sandstone concrete,—28s. ....               | 1,192 | 16 | 0  |
| 682 " blue-metal " 60s. ....                                | 2,046 | 0  | 0  |
| 1,084 " compo. " 40s. ....                                  | 2,168 | 0  | 0  |
| 30 tons ironwork (fixed),—£10.....                          | 300   | 0  | 0  |
| 20 " channel-plates; drilled tie-rods, bolts, &c,—£15 ..... | 300   | 0  | 0  |
| 12 " cast-iron plates,—£10 .....                            | 120   | 0  | 0  |
| 12,000 superficial yards cement rendering,—2s. 6d. ....     | 1,500 | 0  | 0  |
|   | 7,626 | 16 | 0  |
| Cost per foot run nearly.....                               | 3     | 15 | 9½ |

CONTRACT.

## CONTRACT NO. 77—DEPARTMENTAL DESIGN—JUNE 8TH, 1896.

Quantities and estimated cost, Johnstone's and White's Creek Aqueducts. Above footings. Departmental prices as per Schedule.

|  | £       | s. | d. |
|--|---------|----|----|
| 1,760 cubic yards brickwork,—50s. ....                 | 4,400   | 0  | 0  |
| 1,282 „ special bluestone concrete,—60s. ....          | 3,846   | 0  | 0  |
| 1,362 „ sandstone concrete,—28s. ....                  | 1,906   | 0  | 0  |
| 11,774 cubic feet Pyrmont ashlar,—3s. 6d. ....         | 2,060   | 9  | 0  |
| 95 cubic yards tarred metal decking,—48s. ....         | 228     | 0  | 0  |
| 2,662 superficial yards cement rendering,—2s. 6d. .... | 332     | 15 | 0  |
| 130 cubic yards sand filling,—1s. ....                 | 6       | 10 | 0  |
| 40 No. slate covers,—2s. ....                          | 4       | 0  | 0  |
| Total .....  | £12,783 | 14 | 0  |

Price per foot run, 2,013 feet, £6 7s.

## CONTRACT NO. 112.—18TH JUNE, 1896. FOURTH DIVISION WESTERN OUTFALL SEWER.

Total length, 2,320 ft. 1 in., made up in—40 arches, 50 feet span each, 2,000 feet; 38 piers, 8 feet wide each, 304 feet; 4 piers, 4 feet wide each, 16 feet; total, 2,320 ft. 1 in.

Aqueduct only, without approaches or piers, for bridge in centre.

|  |         |    |   |
|--|---------|----|---|
| Sandstone Concrete—  |         |    |   |
| 3,108 cubic yards, in piers and spandrels of arches and footings of piers,—22s. ....                 | 3,418   | 16 | 0 |
| Bluestone Concrete (special)—  |         |    |   |
| 1,643 cubic yards, in channel,—49s. ....   | 4,025   | 7  | 0 |
| Bluestone Concrete (ordinary)—   |         |    |   |
| 1,388 cubic yards, in arches and skewbacks of piers,—40s. ....                                       | 2,776   | 0  | 0 |
| Excavations—   |         |    |   |
| 1,230 cubic yards, for footings and foundations,—2s. 6d. ....  | 153     | 15 | 0 |
| Cement Rendering—  |         |    |   |
| 4,202 superficial yards, inside, 1 of cement to 1 of sand,—2s. ....                                  | 420     | 4  | 0 |
| 8,031 „ external faces, 1 of cement to 2 of sand,—1s. 6d. ....                                       | 602     | 6  | 6 |
| Ironwork—  |         |    |   |
| 56 tons 13 cwt. 1 qr. 24 lb. (say) 57 tons, £13 .....  | 741     | 0  | 0 |
| 459 superficial yards—Val de Travers and bitumen and cork dampcourse; mastic jointing, &c,—10s. .... | 229     | 19 | 0 |
| Total .....  | £12,367 | 7  | 6 |

Cost per foot run, £5 6s. 7½d.

|  |   |    |   |
|--|---|----|---|
| No. 77.—Cost of Departmental Design, Contract No. 77, including foundations, per foot run .....  | 5 | 1  | 3 |
| Mr. M'Creddie's prices:—Total cost, £10,192 7s.  |   |    |   |
| As compared with office prices, departmental plan, per foot run .....  | 5 | 19 | 3 |
| £12,000.   |   |    |   |
| No. 77.—Cost of Monier Design, Contract No. 77, including foundations, per foot run... ..  | 3 | 2  | ¾ |
| Mr. M'Creddie's prices:—Total cost, £6,168 2s.   |   |    |   |
| No. 101.—Cost of Contract No. 101, Western Outfall Sewer, constructed similar to design, but for one-barrel drain instead of three, as shown, at per foot run..... | 4 | 15 | ¼ |
| At departmental rates, £6 10s. 8d.   |   |    |   |
| Comparative Areas of Sections—   |   |    |   |
| No. 112.—When full, 41.22 superficial feet; when three-quarter full, 29.48 superficial feet.   |   |    |   |
| No. 77.—Departmental Design—   |   |    |   |
| White's Creek, when full, 13.0 superficial feet; when three-quarter full   |   |    |   |
| Johnstone's Creek, „ 14.0 „ ; „ „  |   |    |   |
| Monier Design—   |   |    |   |
| White's Creek, when full, 11.56 superficial feet; when three-quarter full, 8.12 superficial feet.  |   |    |   |
| Johnstone's Creek, „ 13.5 „ ; „ „ , 9.57 „   |   |    |   |
| No. 101.—The barrel drain, when full, 28.27 superficial feet.  |   |    |   |

GEO. MCCREDIE.

## Appendix No. 16.

DEPARTMENT OF PUBLIC WORKS.—METROPOLITAN SEWERAGE CONSTRUCTION.—TENDER FORM.—BALMAIN AND LEICHHARDT EXTENSION, 3RD DIVISION, NORTHERN MAIN SEWER.

Contract No. 117.

IN pursuance of an advertisement in the *Government Gazette* (I or we), the undersigned, do hereby tender to provide the material and perform the various works required in and about the full and proper construction, erection, and completion of the Balmain and Leichhardt Extension, 3rd Division of the Northern Main Sewer, agreeably to the Plan, Specification, Schedule to Specification, Special Conditions, and General Conditions, which have been inspected by (me or us), at \_\_\_\_\_ per cent. the prices affixed to each item, in the Schedule of Prices annexed hereto, and to complete the same within ten months from the date of the acceptance of this Tender; and (I or we) do hereby agree that any additions to or deductions from the said works shall be paid or allowed for, as the case may be, at and after the rate quoted above, or if not in Schedule, at a price to be agreed upon at the time, and (I or we) hereby undertake that (I or we) will, within fourteen days from the date of the notification of the acceptance of the said Tender, execute and deliver to the Minister for Public Works a valid legal Contract with Her Majesty the Queen, embodying the terms and conditions above mentioned, and to provide the security required by clause 29 of the said General Conditions; and (I or we) enclose herewith (our or my) cheque for the sum of £77 as a preliminary deposit; and (I or we) agree that such sum shall be absolutely forfeited if (I or we) at any time within thirty days after the said Tender is opened withdraw the same, or if in the event of this Tender being accepted (I or we) fail to complete the above-mentioned Contract document within fourteen days thereafter; and further, that this Tender is made subject to the Conditions contained in the Tender Board Regulations, printed on the back hereof, and by which (I or we) agree to be bound.

Dated this \_\_\_\_\_ day of \_\_\_\_\_ 189 \_\_\_\_\_  
 This is the Tender marked “ \_\_\_\_\_ ” referred to in \_\_\_\_\_ annexed Agreement with Her Majesty the Queen,  
 dated the \_\_\_\_\_ day of \_\_\_\_\_ A.D. 189 \_\_\_\_\_  
 Witness—

## TENDER BOARD REGULATIONS.

No tender shall be received after 11.30 a.m. on the day named for the receipt of such Tender, unless there are circumstances which, in the opinion of the Members of the Board then sitting, render it desirable to do so.

It shall be the duty of the President, Vice-President, or the senior member present, as the case may be, as soon as the Tenders shall have been opened and the necessary particulars ascertained, to publicly announce the number of Tenders received for each work and the name of the lowest Tenderer; but no Tender shall be accepted until the Head of the Branch, under whose directions the work is to be carried out, has reported upon the whole of the Tenders received. The

The Secretary shall, as soon as practicable after the Board has adjourned, exhibit in a conspicuous position, in the Public Works Office, a full statement of the Tenders received, showing the work, the name of the Tenderer, and the amount of each Tender.

All envelopes containing Tenders must be addressed to the President of the Board, and have legibly endorsed upon them the name of the work for which the Tender is submitted.

Every Tender must, as a guarantee of good faith, be accompanied by a preliminary deposit, calculated according to the following scale, viz. :—

|   |         |
|---|---------|
| For amounts up to £500 inclusive .....                    | £5 0 0  |
| For amounts exceeding £500 and not exceeding £1,000 ..... | £10 0 0 |

For all sums over £1,000 one per cent. on the amount of Tender up to a maximum deposit of £500. Such deposit to be in the form of a cheque in favour of the President of the Board, endorsed by the Manager of the Bank upon which it is drawn, or a bank draft.

All deposits, with the exception of that of the successful Tenderer, shall be returned by the Secretary to the person entitled thereto, as soon as possible after the Board shall have adjourned, and the deposit made by the successful Tenderer shall be returned to him on his executing the bond for the fulfilment of the Contract. When the Contract is for a less sum than £200 the deposit with Tender shall not be returnable until the service is satisfactorily completed.

Any Tender which may be received without such preliminary deposit shall, unless otherwise directed by the Board, be deemed to be informal, and rejected accordingly.

In the event of any Tenderer failing to take up his Tender, complete the bond, and proceed with the Contract, within the time specified, or withdrawing his Tender after it shall have been opened, whether such Tender shall have been accepted or not, all moneys deposited by him on account thereof or in connection therewith shall be forfeited to the Crown, and in such case be paid to the credit of the Consolidated Revenue of the Colony.

Whenever a Tenderer shall fail to proceed with a Contract as aforesaid, fresh Tenders shall be invited at short notice for the work, unless in the opinion of the President there are circumstances which make it desirable for another Tender in the same series to be accepted; but the Tenderer by whose default such a course has been rendered necessary shall be excluded from the competition, and from any competition for other works, at the pleasure of the President.

In the event of any Contract being tendered for at a Schedule of Rates, the approximate quantities as given of each item must be worked out and a total sum shown.

In submitting a Tender the full Christian name of the Tenderer must be given, or when the offer is in the name of a firm, the names in full of each member. When bondsmen are required, the names in full, occupations, and addresses must be stated in the Tender. The omission of this information will render the Tender liable to be declared informal.

The Board shall not be bound to accept the lowest or any Tender.

The Board-room shall be open for the admission of the public while the Tenders are being opened and declared.

#### CONTRACT No. 117.

This is the Schedule of Prices hereinbefore referred to.

NOTE.—Unless especially notified otherwise, all reference to Clauses occurring throughout this Schedule of Prices are to be understood to refer to Clauses of the Specification hereunto attached.

| No. of Item. | Description of Work.  | Unit.      | Rate.   | Amount. |
|--------------|---|------------|---------|---------|
|              |   |            | £ s. d. | £ s. d. |
|              | Excavation in open trenches, shafts, and tunnels, for shaft and junction chambers, ventilating shafts, foundations, &c., in any situation, in "ordinary soil" and "solid rock," as specified in clauses 66 and 67 of the Schedule to Specification. |            |         |         |
| 1            | Excavation in Open Trenches in ordinary soil, as above described.....   | cubic yd.  | 0 2 3   |         |
| 2            | Excavation as above, in solid rock, where charges of powder not exceeding 4 in. in length x 1½ in. diameter .....   | "          | 0 6 0   |         |
| 3            | Excavation, as above, in solid rock, where charges of powder not exceeding 2 in. in length x 1½ in. diameter.....   | "          | 0 7 0   |         |
| 4            | Excavation, as above, in solid rock, where gadding and guttering only are permitted .....   | "          | 0 8 0   |         |
| 5            | Excavation for Shafts and Shaft-chambers in ordinary soil, as specified in clause 66 of the Schedule to Specification .....   | "          | 0 5 0   |         |
| 6            | Excavation for the above in solid rock, where charges of powder not exceeding 4 in. in length x 1½ in. diameter .....   | "          | 0 12 0  |         |
| 7            | Excavation, as above, in solid rock, where charges of powder not exceeding 2 in. in length x 1½ in. in diameter .....   | "          | 0 14 0  |         |
| 8            | Excavation for the above in solid rock, where guttering and gadding only are permitted.....   | "          | 1 0 0   |         |
| 9            | Excavation in Tunnels in ordinary soil, and as specified in clause 66 of the Schedule to Specification .....  | "          | 0 10 0  |         |
| 10           | Excavation, as above, in solid rock, where charges of powder not exceeding 4 in. in length x 1½ in. in diameter .....   | "          | 1 8 0   |         |
| 11           | Excavation, as above, in solid rock, where charges of powder not exceeding 2 in. in length x 1½ in. diameter .....  | "          | 1 10 0  |         |
| 12           | Excavation, as before, in solid rock, where gadding and guttering only are permitted .....  | "          | 1 15 0  |         |
| 13           | Sandstone concrete in any situation, as specified .....   | "          | 1 8 0   |         |
| 14           | Bluestone concrete in any situation, as specified .....   | "          | 2 0 0   |         |
| 15           | Special bluestone concrete, as specified .....  | "          | 2 10 0  |         |
| 16           | Brickwork in cement in any situation, as specified .....  | "          | 2 5 0   |         |
| 17           | Cement facing, 1 to 2, in any position where ordered, as specified.....   | square yd. | 0 2 0   |         |
| 18           | Special cement facing, 1 to 1, in any position where ordered, as specified...   | "          | 0 2 3   |         |
|              | Providing, laying, and jointing glazed stoneware, plain, junction, and bend pipes, in trenches, shafts, &c., as specified, including providing and fixing discs complete for—   |            |         |         |
| 19           | 6 in. diameter .....  | lineal ft. | 0 1 0   |         |
| 20           | 9 in. " .....   | "          | 0 1 6   |         |
| 21           | 12 in. " .....  | "          | 0 2 3   |         |
| 22           | Receiving ironwork supplied by the Government, and fixing same in position, as specified.....   | cwt.       | 0 2 6   |         |
| 23           | Hand-packed stone filling 4-in. gauge.....  | cubic yd.  | 0 4 0   |         |
| 24           | Bluestone metal, 2½-in. gauge, including spreading and blinding, with bluestone chippings, as specified.....  | "          | 0 13 0  |         |
| 25           | Squared bluestone pitchers in any situation, as specified.....  | square yd. | 1 5 0   |         |
| 26           | Freestone kerbing, set in position, as specified .....  | lineal ft. | 0 2 6   |         |

| No of Item | Description of Work  | Unit        | Rate            | Amount |
|------------|--|-------------|-----------------|--------|
| 27         | Squared freestone pitchers 6 in deep, set in any situation, as specified   | square yd   | £ s d.<br>0 8 0 |        |
| 28         | Fixing, where ordered, two rail fence, as specified in clause 5  | rod         | 0 7 0           |        |
| 29         | Subducts in ordinary soil, when ordered, of glazed stoneware pipes, 6 in internal diameter, laid as specified      | lineal yard | 0 1 6           |        |
| 30         | Sand filling, if required, placed in position  | cubic yd    | 0 1 0           |        |
| 31         | Timber ordered in writing to be left in excavations, including all iron used in fixing same, as specified          | cubic ft    | 0 2 0           |        |
| 32         | Timber foundation, if required   | "           | 0 2 3           |        |
| 33         | Portland cement  | cask        | 0 13 0          |        |
| 34         | Special bluestone concrete in any situation, as specified in clause 107 of the Schedule to Specification           | cubic yd    | 3 5 0           |        |
| 35         | Bluestone metal, 1½ in gauge, stacked  | "           | 0 11 0          |        |
| 36         | Bluestone metal, 2½ in gauge, stacked  | "           | 0 10 0          |        |
| 37         | Sandstone metal, 2 in gauge, stacked   | "           | 0 4 0           |        |
| 38         | Sharp, clean, washed sand, stacked, as specified in clause 17 of the Schedule to Specification                     | "           | 0 5 0           |        |
| 39         | Sawn hardwood or Oregon in scantlings or planks, as specified in clauses 27 to 30 of the Schedule to Specification | cubic ft    | 0 2 6           |        |
| 40         | Wrought iron in screws, bolts, nails, spikes, straps, &c   | lb          | 0 0 4           |        |
| 41         | Mechanic supplied by Contractor  | day         | 0 11 0          |        |
| 42         | Quarry men or other skilled labourer supplied by Contractor  | "           | 0 8 0           |        |
| 43         | Ordinary labourer supplied by Contractor   | "           | 0 7 0           |        |
| 44         | Cart, 1 horse, and driver, supplied by Contractor  | "           | 0 10 0          |        |
| 45         | Cart, 2 horses, and driver, supplied by Contractor   | "           | 0 13 0          |        |
|            | Total  | ...         |                 |        |

Tenderers must state only one rate of percentage above or below all the prices in the above Schedule

All work herein enumerated shall be understood as being placed in position where specified and ordered and in complete working condition, in accordance with the Specification

The above Schedule Prices include, in every case, continual maintenance of the works during the whole time of construction, and up to the day of their being formally taken over by the Engineer

Prices for items Nos 41, 42, 43, 44, and 45 are to be for such as are able bodied and efficient. The Schedule rates per day are for the day of eight hours. In the event of overtime and night work being ordered, it is to be paid for at 25 per cent advance on the time rates set down for day work

The whole of the foregoing prices to include all labour, tools, implements, plant, machinery, shoring, timbering, centering, concrete boxes, unwatering, coffer dams, fluming, temporary bridges, roads, pumping, gasket filling, diverting water courses and surface water, diverting and maintaining the traffic along roads, crossing over pipe sewers, disposal and removal of surplus materials on completion of Contract, reinstating all roads and other surfaces, &c, and any other thing necessary in executing and completing each respective item in accordance with plans and Specification.

This is the Schedule of Prices marked " " referred to in annexed Agreement with Her Majesty the Queen, dated the                      day of                      A D 189 .

Witness —

### Appendix No. 17.

#### MONIER SYSTEM—CONTRACT No 77

##### APPROXIMATE Estimate for White's and Johnstone Creeks Aqueducts

|                |             |  |          | £ s d      |
|----------------|-------------|--|----------|------------|
| 680 yards      | Cube        | Excavation (irrespective of formation) | 3/-      | 102 0 0    |
| 1,464 "        | "           | Sandstone concrete (1, 2, and 5)       | £1 2s 6d | 1,647 0 0  |
| 658 "          | "           | Blue metal concrete (1, 2, and 4)      | £2       | 1,316 0 0  |
| 994 "          | "           | Compo (1 to 3)                         | £1 10s   | 1,491 0 0  |
| 11 tons 14 cwt | "           | Cast iron                              | £12      | 140 8 0    |
| 38 " 1 "       | "           | Plain wrought-iron                     | £11      | 418 11 0   |
| 18 " 8 "       | "           | Channel iron                           | £14      | 257 12 0   |
| 11,440 yards   | Superficial | Cement rendering                       | 1/6      | 858 0 0    |
|                |             | Total                                  | £        | 6,230 11 0 |
|                |             | Or £3 1s 8½d per foot                  |          |            |

#### DEPARTMENTAL PLANS—CONTRACT No 77.

##### APPROXIMATE Estimate for White's and Johnstone's Creeks Aqueducts

|             |             |                                    |          | £ s d       |
|-------------|-------------|------------------------------------|----------|-------------|
| 672 yards   | Cube        | Excavation (soil)                  | 1/0      | 58 16 0     |
| 376 "       | "           | Excavation (rock)                  | 5/-      | 94 0 0      |
| 1,720 "     | "           | Concrete, sandstone (1, 2, and 5)  | £1 2s 6d | 1,935 0 0   |
| 1,030 "     | "           | Special blue-metal concrete        | £2       | 2,060 0 0   |
| 93 "        | "           | Tarred metal                       | 36/-     | 167 8 0     |
| 1,890 "     | "           | Double pressed brickwork in cement | £2       | 3,780 0 0   |
| 11,838 feet | "           | Ashlar masonry                     | 3/-      | 1,775 14 0  |
| 2,694 yards | Superficial | Cement rendering inside sewer      | 1/6      | 202 1 0     |
|             |             | Total                              | £        | 10,072 19 0 |
|             |             | Or £4 19s 8½d per foot lineal.     |          |             |
|             |             | Estimate—Department's design       |          | 10,072 19 0 |
|             |             | Monier                             |          | 6,230 11 0  |
|             |             | Difference                         | £        | 3,842 8 0   |

CONTRACT No. 77.

COMPARISON of a 52-ft. 3-in. length of Aqueduct executed (1st) in the specified materials, and (2nd) in similar materials to No. 101.

|  |                |   | No. 77. |          | No. 101. |         |
|--|----------------|---|---------|----------|----------|---------|
| <i>Estimated Values.</i>   |                |   |         | £ s. d.  |          | £ s. d. |
| 23 yards ...   | Cube .....     | Sandstone concrete in lieu of brickwork in spandrels. | 40/-    | 46 0 0   | 23/-     | 26 9 0  |
| 51½ "  | Superficial... | Cementing spandrels .....                             |         |          | 1/6      | 3 17 3  |
| 304 feet ...   | Cube .....     | Blue-metal concrete in lieu of stone dressings ...    | 3/-     | 45 12 0  | 1/6      | 22 16 0 |
| 93 yards ...   | Superficial... | Cementing carrier sides .....                         |         |          | 1/6      | 6 19 6  |
| Totals.....£   |                |   |         | 91 12 0  |          | 60 1 9  |
| £91 12s. — £60 1s. 9d. = £31 10s. 3d. ÷ 52' 3" = 12s. 06d. per foot.   |                |   |         |          |          |         |
| <i>Schedule Values.</i>  |                |   |         | £ s. d.  |          | £ s. d. |
| 23 yards ...   | Cube .....     | Concrete, &c.....                                     | 50/-    | 57 10 0  | 28/-     | 32 4 0  |
| 51½ "  | Superficial... | Cementing.....  |         |          | 2/6      | 6 8 9   |
| 304 feet ...   | Cube .....     | Stonework .....                                       | 3/6     | 53 4 0   | 2/2      | 32 18 8 |
| 93 yards ...   | Superficial... | Cementing .....                                       |         |          | 2/6      | 11 12 6 |
| Totals.....£   |                |   |         | 110 14 0 |          | 83 3 11 |
| £110 14s. — £83 3s. 11d. = £27 10s. 1d. ÷ 52' 3" = 10s. 6½d. per foot. |                |   |         |          |          |         |

NOTE.—Piers, brick arches, and carrier are common to both, and are not estimated.

CONTRACT No. 77.

MEMO. of Quantities outside Aqueducts (Departmental), including footings to same not previously measured. I have checked the various items in the Government schedule, and have so closely agreed with them as to adopt them here.

|                         |                |   | Item |        | £ s. d.    |
|-------------------------|----------------|---|------|--------|------------|
| 4,240 yards...          | Cube .....     | Excavation in soil, &c.....             | 1    | 2/-    | 424 0 0    |
| 140 "                   | "              | " rock .....                            | 2    | 7/-    | 49 0 0     |
| 1,160 "                 | "              | " rock .....                            | 3    | 6/-    | 348 0 0    |
| 90 "                    | "              | " rock for tunnels .....                | 4    | 3/5/-  | 292 10 0   |
| 100 "                   | "              | " rock for tunnels .....                | 5    | £3     | 300 0 0    |
| 1,000 "                 | "              | " rock for tunnels .....                | 6    | 2/17/6 | 2,875 0 0  |
| 70 "                    | "              | " earth for shafts .....                | 7    | 6/-    | 21 0 0     |
| 4 "                     | "              | " rock for shafts.....                  | 8    | 22/6   | 4 10 0     |
| 70 "                    | "              | " rock for shafts.....                  | 9    | £1     | 70 0 0     |
| 2 "                     | "              | " rock for shafts.....                  | 10   | £1/10  | 3 0 0      |
| 2,300 "                 | "              | Filling .....                           | 11   | 1/-    | 115 0 0    |
| 740 "                   | "              | Sandstone ballast .....                 | 13   | 4/-    | 148 0 0    |
| 370 "                   | "              | Road metal .....                        | 14   | 12/-   | 222 0 0    |
| 180 "                   | "              | Bluestone screenings .....              | 15   | 5/-    | 45 0 0     |
| 50 "                    | Lineal .....   | Subducts .....                          | 16   | 1/6    | 3 15 0     |
| 300 feet ...            | Cube .....     | Timber .....                            | 17   | 1/8    | 25 0 0     |
| 960 "                   | Lineal .....   | Piles .....                             | 18   | 4/-    | 192 0 0    |
| 776 yards...            | Cube .....     | Sandstone concrete .....                | 19   | 1/8/-  | 1,086 8 0  |
| 590 "                   | "              | Bluestone concrete .....                | 20   | 2/10/- | 1,475 0 0  |
| 166 "                   | "              | Brick in cement .....                   | 22   | 2/10/- | 415 0 0    |
| 2,960 "                 | Superficial... | Cement facing, 1 to 2 .....             | 23   | 2/3    | 333 0 0    |
| 130 feet ...            | Cube .....     | Freestone steps.....                    | 26   | 3/-    | 19 10 0    |
| 650 "                   | Lineal .....   | Freestone kerb .....                    | 27   | 2/6    | 81 5 0     |
| "                       | No., 4.....    | Gully covers .....                      | 28   | 18/6   | 3 14 0     |
| "                       | No., 40 .....  | Slate covers .....                      | 29   | 2/-    | 4 0 0      |
| 8 yards...              | Superficial... | Bluestone pitchers .....                | 30   | 12/6   | 5 0 0      |
| 320 "                   | "              | Freestone pitchers .....                | 31   | 8/-    | 128 0 0    |
| 50 rods ...             | Lineal .....   | Ordnance fencing.....                   | 32   | 18/-   | 45 0 0     |
| 100 "                   | "              | Split fencing.....                      | 33   | 8/-    | 40 0 0     |
| 120 yards...            | "              | 24-in. diameter drains .....            | 34   | 33/-   | 198 0 0    |
| 20 "                    | "              | 12-in. drains .....                     | 35   | 6/9    | 6 15 0     |
| 15 "                    | "              | 9-in drains.....                        | 36   | 5/-    | 3 15 0     |
| 64 "                    | "              | 4-in. scuppers .....                    | 37   | 1/6    | 4 16 0     |
| 4,580 "                 | Cube .....     | Carting spoil .....                     | 38   | -/9    | 171 15 0   |
| 4,580 "                 | "              | Carting spoil an additional ¼ mile..... | 39   | -/4    | 76 6 8     |
| 125 "                   | Cwt. ....      | Fixing metal work .....                 | 40   | 4/-    | 25 0 0     |
| "                       | No., 10 .....  | Flap-traps .....                        | 41   | 1/5/-  | 12 10 0    |
|                         |                |   |      |        | 9,272 9 8  |
| Less 28½ per cent. .... |                |   |      |        | 2,642 13 0 |
| Net value.....£         |                |   |      |        | 6,629 16 8 |



## CONTRACT No. 101.

APPROXIMATE Estimate, exclusive of Piles, for one Carrier, to a length of 60 feet, including 2 Arches and 2½ Piers.

|          |             |                                   | Estimated Value. |     |    | Contract Price. |      |     |    |    |
|----------|-------------|-----------------------------------|------------------|-----|----|-----------------|------|-----|----|----|
|          |             |                                   | £                | s.  | d. | £               | s.   | d.  |    |    |
| 52 yards | Cube        | Excavation, soft                  | 1/6              | 3   | 18 | 0               | 1/6  | 3   | 18 | 0  |
| 108 "    | "           | Sandstone concrete (1, 2, and 5)  | 23/-             | 124 | 4  | 0               | 28/- | 151 | 4  | 0  |
| 59 "     | "           | Blue-metal concrete (1, 2, and 4) | £2               | 118 | 0  | 0               | 34/- | 100 | 6  | 0  |
| 27½ "    | "           | Brickwork                         | £2               | 54  | 8  | 0               | 44/- | 59  | 16 | 10 |
| 290 "    | Superficial | Cement rendering, ½ inch          | 1/6              | 21  | 15 | 0               | 2/3  | 32  | 12 | 6  |
| 50 "     | "           | Tar-paving, 1½ inch thick         | 2/-              | 5   | 0  | 0               | 2/-  | 5   | 0  | 0  |
| Totals   |             |                                   | ...              | 327 | 5  | 0               | ...  | 352 | 17 | 4  |

Estimate:—£327 5s. ÷ 60 feet = £5 9s. 1d. per foot lineal.

Contract:—£352 17s. 4d. ÷ 60 feet = £5 17s. 7½d. per foot lineal.

Area of carrier = 28·27 feet superficial.

## CONTRACT No. 112.

APPROXIMATE Estimate for Aqueduct.

|                |             |                                   | £      | s.     | d. |   |
|----------------|-------------|-----------------------------------|--------|--------|----|---|
| 1,216 yards    | Cube        | Excavation (soil)                 | 2/-    | 121    | 12 | 0 |
| 3,140 "        | "           | Sandstone concrete (1, 2, and 5)  | 1/3/-  | 3,611  | 0  | 0 |
| 1,399 "        | "           | Blue-metal concrete (1, 2, and 4) | £2     | 2,798  | 0  | 0 |
| 1,625 "        | "           | Special concrete                  | £2 8s. | 3,900  | 0  | 0 |
| 56 tons 5 cwt. | "           | Wrought-iron                      | £13    | 731    | 5  | 0 |
| 8,440 yards    | Superficial | Cement rendering (1 to 2)         | 1/6    | 633    | 0  | 0 |
| 4,210 "        | "           | Cement rendering (1 to 1)         | 1/10½  | 394    | 18 | 0 |
| 316 yards      | No., 76     | Bluestone stops                   | 2/-    | 7      | 12 | 0 |
| 143 "          | Superficial | ½-inch cork and bitumen           | 10/-   | 158    | 0  | 0 |
|                | "           | ¾-inch val-de-travers             | 10/-   | 71     | 10 | 0 |
| Total          |             |                                   | .....  | 12,426 | 17 | 0 |

Or £5 7s. 1½d. per foot lineal.

## PARTICULARS SHOWING HOW VALUES HAVE BEEN ESTIMATED.

|  |   |    |    |   |
|--|---|----|----|---|
| 1st compo. 1 to 3, at £1 10s. per yard cube (Hurst's Tables, 8·13 cube feet cement, 24·34 cube feet of sand, and 37 gallons of water = 1 yard cube)— | £ | s. | d. |   |
| 2½ casks cement, at 9s. 6d.  | 0 | 19 | 9½ |   |
| 25 cubic feet of sand  | 0 | 2  | 6  |   |
| Labour—mixing  | 0 | 1  | 3  | A small mortar mill will mix 25 yards per diem.                       |
| Centres (see below)  | 0 | 2  | 0  |   |
| Labour—placing   | 0 | 4  | 5½ | Allowing a man to deposit 1½ yard per diem, or 13 large barrow-loads. |
| Total  | 1 | 10 | 0  |   |

Centres for above (centering for 2 arches and 80 feet, lineal, of channel)—

|  |     |    |    |
|--|-----|----|----|
|  | £   | s. | d. |
| 2,800 feet superficial struts and sills, at 14s. | 19  | 12 | 0  |
| 6,400 " principals and bolts, at 20s.            | 64  | 0  | 0  |
| 1,200 " boarding under arch, at 14s.             | 8   | 8  | 0  |
| 1,760 " boarding channel, at £1                  | 17  | 12 | 0  |
| Total  | 109 | 12 | 0  |
| Less value on completion                         | 10  | 19 | 0  |
| Net  | 98  | 13 | 0  |

Or for 990 yards compo. (say) 2s. per yard.

2nd estimate for sandstone concrete 1, 2, and 5, at £1 2s. 6d. per yard—

|                                     | £        | s.        | d.        |                       |
|-------------------------------------|----------|-----------|-----------|-----------------------|
| 5 yards cube sandstone, at 3s. .... | 0        | 15        | 0         |                       |
| 2 " " sand, at 2s. 6d. ....         | 0        | 5         | 0         |                       |
| 6½ casks cement, at 9s. 6d. ....    | 3        | 4         | 1½        |                       |
| <b>Material for 5 yards</b> .....   | <b>4</b> | <b>4</b>  | <b>1½</b> | <b>or</b>             |
| <b>Material per yard</b> .....      | <b>0</b> | <b>16</b> | <b>10</b> |                       |
| <b>Add labour, &amp;c.</b> .....    | <b>0</b> | <b>5</b>  | <b>8</b>  |                       |
| <b>Total</b> .....                  | <b>1</b> | <b>2</b>  | <b>6</b>  | <b>per yard cube.</b> |

3rd estimate for blue-metal concrete 1, 2, and 4, at £2 per yard—

|  |          |           |          |                       |
|--|----------|-----------|----------|-----------------------|
| 4 yards cube blue-metal, 1½ inch, at 12s. .... | 2        | 8         | 0        |                       |
| 2 " " sand, at 2s. 6d. ....                    | 0        | 5         | 0        |                       |
| 6½ casks cement, at 9s. 6d. ....               | 3        | 4         | 1        |                       |
| <b>Material for 4 yards</b> .....              | <b>5</b> | <b>17</b> | <b>1</b> | <b>or</b>             |
| <b>Material per yard</b> .....                 | <b>1</b> | <b>9</b>  | <b>3</b> |                       |
| <b>Add labour, &amp;c.</b> .....               | <b>0</b> | <b>10</b> | <b>9</b> |                       |
| <b>Total</b> .....                             | <b>2</b> | <b>0</b>  | <b>0</b> | <b>per yard cube.</b> |

4th estimate for blue-metal concrete 2, 3, and 7, at £2 per yard cube—

|   |           |           |          |                       |
|---|-----------|-----------|----------|-----------------------|
| 7 yards cube metal, at 12s. ....        | 4         | 4         | 0        |                       |
| 3 " " sand, at 2s. 6d. ....             | 0         | 7         | 6        |                       |
| 13½ casks cement, at 9s. 6d. ....       | 6         | 8         | 2        |                       |
| <b>Materials for 7 yards cube</b> ..... | <b>10</b> | <b>19</b> | <b>8</b> | <b>or</b>             |
| <b>Materials for 1 yard</b> .....       | <b>1</b>  | <b>11</b> | <b>4</b> |                       |
| <b>Add labour, &amp;c.</b> .....        | <b>0</b>  | <b>8</b>  | <b>8</b> |                       |
| <b>Total</b> .....                      | <b>2</b>  | <b>0</b>  | <b>0</b> | <b>per yard cube.</b> |

5th estimate for blue-metal concrete 1, 1½, and 3, at £2 8s. per yard—

|   |          |           |           |                       |
|---|----------|-----------|-----------|-----------------------|
| 3 yards cube ¾-inch metal, at 14s. .... | 2        | 2         | 0         |                       |
| 1½ " " sand, at 2s. 6d. ....            | 0        | 3         | 9         |                       |
| 6½ casks cement, at 9s. 6d. ....        | 3        | 4         | 1         |                       |
| <b>Materials for 3 yards</b> .....      | <b>5</b> | <b>9</b>  | <b>10</b> | <b>or</b>             |
| <b>Materials for 1 yard</b> .....       | <b>1</b> | <b>16</b> | <b>7</b>  |                       |
| <b>Add labour, &amp;c.</b> .....        | <b>0</b> | <b>11</b> | <b>5</b>  |                       |
| <b>Total</b> .....                      | <b>2</b> | <b>8</b>  | <b>0</b>  | <b>per yard cube.</b> |

6th estimate for brick in cement, at £2 per yard cube—

|   |           |           |          |                                 |
|---|-----------|-----------|----------|---------------------------------|
| Per rod, 4,000 double-pressed bricks, at £3 17s. 6d. .... | 15        | 10        | 0        |                                 |
| 6½ casks cement, at 9s. 6d. ....                          | 3         | 1         | 9        |                                 |
| 2 yards sand, at 2s. 6d. ....                             | 0         | 5         | 0        |                                 |
| Labour, &c. ....  | 3         | 16        | 6        |                                 |
|   | <b>22</b> | <b>13</b> | <b>3</b> | <b>per rod, or £2 per yard.</b> |

7th estimate for ¾-inch cement rendering 1 to 2—

|   |          |          |           |                                  |
|---|----------|----------|-----------|----------------------------------|
| 1 bushel of cement, at 9s. 6d. per cask ..... | 0        | 3        | 1         |                                  |
| 2 bushels of sand .....                       | 0        | 0        | 3         |                                  |
| <b>Materials for 4·8 yards</b> .....          | <b>0</b> | <b>3</b> | <b>4</b>  | <b>or</b>                        |
| <b>Materials for 1 yard</b> .....             | <b>0</b> | <b>0</b> | <b>8¼</b> | } Total 1s. 4¼d. per yard suppl. |
| <b>Labour, &amp;c.</b> .....                  | <b>0</b> | <b>0</b> | <b>8</b>  |                                  |

8th estimate for ¾-inch cement rendering 1 to 1—

|  |          |          |          |                                 |
|--|----------|----------|----------|---------------------------------|
| Cement and sand as above for 3½ yards .. | 0        | 3        | 4        | <b>or</b>                       |
| <b>For 1 yard</b> .....                  | <b>0</b> | <b>1</b> | <b>0</b> | } Total 1s. 8d. per yard suppl. |
| <b>Labour</b> .....                      | <b>0</b> | <b>0</b> | <b>8</b> |                                 |

MESSRS. CARTER, GUMMOW, & Co.'s CONTRACTS.

RETURN showing number of barrels of cement necessary for the execution of the various items paid for by voucher.

NOTE.—Each barrel estimated to contain 4 cubic feet as specified. The respective quantities of cement required are strictly consistent with the estimates handed in upon a previous occasion, attached to estimates for No. 77.

| Item.                                 | Description.   | Quantity.                      | Barrels of Cement required.             | Totals. |
|---------------------------------------|--|--------------------------------|---|---------|
| CONTRACT No. 69.                      |  |                                |   |         |
| 31                                    | Sandstone concrete mixed—1 cement, 2 sand, and 5 of 2-in. sandstone. | 1,031 yds. cube ...            | 1'35 cask per yd. ....                  | 1,391   |
| 32                                    | Bluestone concrete mixed—1 cement, 2 sand, and 4 of blue metal.      | 4,844 ,, ...                   | 1'6875 ,, ....                          | 8,174   |
| 33                                    | Brickwork—1 cement to 2 of sand .....                                | 1,921 ,, ...                   | $\frac{1}{2}$ a cask per yd. ....       | 960     |
| 34                                    | $\frac{3}{8}$ -in. cement rendering mixed—1 cement to 2 of sand.     | 10,683 yds. sup. ...           | A cask = 17 $\frac{1}{2}$ yds. sup. ... | 610     |
| 39                                    | 9-in. e.w. drain, jointed in cement.....                             | 96 ft. lin. ..                 | } For jointing .....                    | 2       |
| 40                                    | 12-in. ,, ,, .....   | 93 ,, ...                      |   |         |
| 41                                    | 16-in. ,, ,, .....   | 33 ,, ...                      |   |         |
| 42                                    | 18-in. ,, ,, .....   | 6 ,, ...                       |   |         |
| 96                                    | Cement .....   | 11 casks .....                 |   | 11      |
| 11,148                                |  |                                |   |         |
| CONTRACT No. 72.                      |  |                                |   |         |
| 4                                     | Brickwork—1 cement to 2 of sand .....                                | 32 yds. cube ...               | $\frac{1}{2}$ a cask per yd. ....       | 16      |
| 5                                     | Sandstone concrete mixed—1 cement, 2 sand, and 5 of 2-in. sandstone. | 8,372 ,, ...                   | 1'35 cask per yd. ....                  | 11,302  |
| 6                                     | $\frac{3}{8}$ -in. cement rendering—1 to 2 .....                     | 12,324 yds. sup. ...           | A cask = 17 $\frac{1}{2}$ yds. sup. ... | 704     |
| 7                                     | 24-in. e.w. drain, jointed in cement.....                            | 58 ft. lin. ...                | } For jointing (say) .....              | 3       |
| 9                                     | 18-in. ,, ,, .....   | 349 ,, ...                     |   |         |
| 10                                    | 12-in. ,, ,, .....   | 4 ,, ...                       |   |         |
| 11                                    | 9-in. ,, ,, .....  | 2 ,, ...                       |   |         |
| 12                                    | 6-in. ,, ,, .....  | 357 ,, ...                     |   |         |
| 28                                    | Cement .....   | 2 casks .....                  |   | 2       |
| 12,027                                |  |                                |   |         |
| CONTRACT No. 77 (on 12th May, 1896).  |  |                                |   |         |
| 19                                    | Sandstone concrete mixed—1 cement, 2 sand, and 5 of 2-in. sandstone. | 1,388 yds. cube ...            | 1'35 cask per yd. ....                  | 1,873   |
| 20                                    | Bluestone concrete .....   | 146 ,, ...                     | 1'6875 ,, ....                          | 246     |
| 21                                    | Compo.—1 cement to 3 of sand .....                                   | 576 ,, ...                     | 2 $\frac{1}{2}$ casks per yd. ....      | 1,200   |
| 34                                    | 24-in. e.w. drain, cement jointed .....                              | 270 ft. lin. ...               | } For jointing (say) .....              | 2       |
| 35                                    | 12-in. ,, ,, .....   | 60 ,, ...                      |   |         |
|                                       | Cement .....   | 150 casks .....                |   | 150     |
| 3,471                                 |  |                                |   |         |
| CONTRACT No. 79.                      |  |                                |   |         |
| 17                                    | Sandstone concrete—1 cement, 2 sand, and 5 of 2-in. sandstone.       | 1,872'17 yds. cube             | 1'35 cask per yd. ....                  | 2,527   |
| 18                                    | Bluestone concrete—1 cement, 2 sand, and 4 of bluestone.             | 1,562'52 ,, ...                | 1'6875 ,, ....                          | 2,636   |
| 19                                    | Brickwork—1 cement to 2 sand .....                                   | 521'81 ,, ...                  | $\frac{1}{2}$ a cask per yd. ....       | 260     |
| 21                                    | $\frac{3}{8}$ -in. cement rendering—1 to 2 .....                     | 8,779'12 yds. sup. ...         | A cask = 17 $\frac{1}{2}$ yds. sup. ... | 502     |
| 22                                    | Bluestone concrete mixed—2 cement, 3 sand, and 7 of blue metal.      | 161 yds. cube ...              | 1'9285 cask per yd. ....                | 310     |
| 23                                    | Brickwork—1 cement to 2 of sand .....                                | 862'99 ,, ...                  | $\frac{1}{2}$ a cask per yd. ....       | 431     |
| 24                                    | $\frac{3}{8}$ -in. cement rendering—1 to 2 .....                     | 255'06 yds. sup. ...           | A cask = 17 $\frac{1}{2}$ yds. sup. ... | 14      |
| 27                                    | 18-in. e.w. drain, cement jointed .....                              | 3 ft. lin. ...                 | } For jointing (say) .....              | 1       |
| 28                                    | 9-in. ,, ,, .....  | 31 ,, ...                      |   |         |
| 43                                    | Cement .....   | 7 casks .....                  |   | 7       |
| 6,688                                 |  |                                |   |         |
| CONTRACT No. 79A.                     |  |                                |   |         |
| 12                                    | Sandstone concrete—1 cement, 2 sand, and 5 of 2-in. sandstone.       | 659 yds. cube ...              | 1'35 cask per yd. ....                  | 889     |
| 13                                    | Bluestone concrete—1 cement, 2 sand, and 4 of blue metal.            | 1,270 ,, ...                   | 1'6875 ,, ....                          | 2,143   |
| 14                                    | Brickwork—1 cement to 2 sand .....                                   | 297 ,, ...                     | $\frac{1}{2}$ a cask per yd. ....       | 148     |
| 15                                    | $\frac{3}{8}$ -in. cement rendering—1 to 2 .....                     | 2,522 yds. sup. ...            | A cask = 17 $\frac{1}{2}$ yds. sup. ... | 144     |
| 20                                    | 9-in. e.w. drain, cement jointed .....                               | 472 ft. lin. ....              | For jointing (say) .....                | 1       |
| 3,325                                 |  |                                |   |         |
| HIGH-STREET, No. 79A.                 |  |                                |   |         |
| 12                                    | Sandstone concrete—1 cement, 2 sand, and 5 of 2-in. sandstone.       | 104 $\frac{1}{2}$ yds. cube... | 1'35 cask per yd. ....                  | 141     |
| 13                                    | Bluestone concrete—1 cement, 2 sand, and 4 of blue metal.            | 170 ,, ...                     | 1'6875 ,, ....                          | 236     |
| 14                                    | Brickwork—1 cement, 2 sand .....                                     | 42 ,, ...                      | $\frac{1}{2}$ a cask per yd. ....       | 21      |
| 15                                    | $\frac{3}{8}$ -in. cement rendering—1 to 2 .....                     | 473 yds. sup. ...              | A cask = 17 $\frac{1}{2}$ yds. sup. ... | 27      |
| 20                                    | 9-in. e.w. drain, cement jointed .....                               | 133 ft. lin. ....              | For jointing (say) .....                | 1       |
| 476                                   |  |                                |   |         |
| CONTRACT No. 118 (on 26th May, 1896). |  |                                |   |         |
| 7                                     | Sandstone concrete—1 cement, 2 sand, and 5 of 2-in. sandstone.       | 5,363 yds. cube ...            | 1'35 cask per yd. ....                  | 7,240   |
| 8                                     | $\frac{3}{8}$ -in. cement facing—1 to 2 .....                        | 16,169 yds. sup. ...           | A cask = 17 $\frac{1}{2}$ yds. sup. ... | 924     |
| 9                                     | Brick in cement—1 to 2 .....   | 9 yds. cube ...                | $\frac{1}{2}$ a cask per yd. ....       | 4       |
| 10                                    | 24-in. e.w. drain, cement jointed .....                              | 30 ft. lin. ....               | For jointing (say) .....                | 1       |
| 8,169                                 |  |                                |   |         |
| Grand Total .....                     |  |                                |   | 45,304  |

SUPPLEMENTARY Statement of completed Contracts included in the above.

|                        |        |
|------------------------|--------|
| Contract No. 69 .....  | 11,148 |
| "    No. 79 .....      | 6,688  |
| "    No. 79A .....     | 3,325  |
| "    High-street ..... | 476    |
| Total .....            | 21,637 |

W. THOMPSON.  
Appendix

## Appendix No. 18.

Sir, Patent's Office, Sydney, N.S.W., 3-(17) November, 1892.  
I beg to make application for Letters Patent for an invention of "Improvements in concrete and cement mortar building and other constructions and manufactures." The petitioners being Messrs. J. Carter, D. G. Snodgrass and W. Baltzer.

In connection with this application, I enclose the following documents:—

1. A petition in the form prescribed by law.
2. A complete specification of the invention.
3. A copy of the specification.
4. Two sheets of drawings (in duplicate).
5. A Treasury receipt for £5.

Yours, &c.,  
FRED WALSH,  
Manager.

The Examiner of Patents.

The 7th sub-sec. of Reg. 22 has not been complied with.—P.P.P., 4/11/92.

I cannot report in favour of this application, as it seems to me that the alleged improvements have been anticipated in the invention revealed in the specification attached to Letters Patent of this Colony, No. 3,147. Inform agent.—J. B. O'C., 9/12/92.

International Patent and Trade Marks Office, established,—Melbourne, 1859; Sydney, 1882; Brisbane, 1887; Sydney, 22nd December, 1892.

Sir, Re Carter and others application for Letters Patent, No. 4,084. 11 January, 1893.

I have to thank you for yours of 9th instant herein, and specially for the reference you make to Letters Patent, 3,147.

My clients, however, were aware of the patent mentioned, and believed that in their claims they have avoided claiming anything included in the claims of that prior patent or shown in the specification thereof.

I would point out that in the former patent it is essential that *beams* be used, and it is over and between the beams that the patentee places or droops a *wire fabric*, the whole being embedded in concrete. My clients dispense with the beams altogether, and use solid bars tied together to form a skeleton on which the concrete is supported, and there is no wire fabric in the strict sense of the term used in my clients constructions. The claims of Messrs. Carter and others are not wide, being simply for the material consisting of bars laid across each other and tied at their intersections, embedded in concrete, as an improvement in building. Should you require it, I am willing to insert the words "and tied at their intersections" after the words "other" and "another" in the first and second claims respectively.

I trust in view of the foregoing you will see your way clear to recommend the grant of my clients' application.

Yours, &c.,  
FRED WALSH,  
Manager.

The Examiner of Patents, Patents Office, Sydney.

Upon reconsideration, and in view of the communication from Mr. Walsh, I am now of opinion that if the suggested amendments be made in the specification Letters Patent might issue to his clients. Inform.—J. B. O'C., 12/1/93.

(A.)

## COMPLETE SPECIFICATION.

Improvements in concrete and cement mortar building and other constructions and manufactures.

We, John Carter, David Graham Snodgrass, and William Baltzer, all of North Sydney, in the Colony of New South Wales, engineers, do hereby declare the nature of the abovenamed invention or improvement to be as follows:—

This invention, consisting of improvements in concrete and cement mortar building and other constructions and manufactures, is especially adapted for constructing buildings, bridges, arches, sewers, pipes, water tanks, gas reservoirs, walls, floorings, ceilings, roofings, stairs, columns, and fire-proof structures, and concrete or cement mortar constructions and manufactures of all kinds and conditions in which strength and safety from fire, together with economy in cost, are required. It is especially useful in the construction or production of culverts, arched and other bridges, subways, aqueducts, bridge flooring, outside partition and double walls, fire and burglar proof receptacles and strong rooms, arched and level ceilings, roofs, arches, girders, steps, staircases, columns, baths, hollow bricks and masonry, chimneys, water tanks, gas reservoirs, cattle and other troughs, swimming basins, flower-pots, pipes for water, gas, telegraph wires, conduits for cable ways, lining for tunnels, shafts, wells, and cesspits, locks and gates for rivers, flagging for yards, floors, and footpaths, walls and floors of silos, sewers, open channels, factory chimneys, and light-houses, and for similar purposes. Among the many advantages which buildings and other structures and manufactures constructed according to this invention possess over similar ordinary work are speed of erection without prejudice to durability and security of the work, immunity from injury by water, extraordinary power of resisting very high and variable temperatures, great strength, lightness, saving of space, the satisfying of all acoustic and hygienic demands, and cheapness and neatness.

In carrying out these improvements, a lattice or skeleton work consisting of a number of iron bars or rods is first formed, the bars being held in their relative positions by binding at their intersections. Should the bars be insufficiently long to reach from end to end of the structure or article, they are overlapped and held by a similar thin binding. Any other suitable method, however, for holding the bars together at their intersections or overlappings might be employed. The bars used are of different sizes, and are placed to suit the various stresses to which the structure is likely to be subjected, the larger or stronger being placed in the direction of the tension and the thinner being placed across them, thus forming open angular meshes of suitable size and angle. The binding is of sufficient strength to hold the bars in position, during the process of packing the concrete around them. This lattice or skeleton work is erected in the required position and is supported in the manner most suitable for the construction for which it is intended, care being taken that the iron-work is kept at a sufficient distance from the intended outside face of the concrete that a good covering thereof will be ensured round the said iron. The bars having been properly arranged and secured in their places, concrete or cement mortar, or plastic material of sufficient strength of any suitable description, is pressed in the usual manner of moulding such structures or articles round the bars or lattice or skeleton work to the required thickness in such a manner that a good solid body is formed. In setting, the concrete for mortar or plastic material shrinks, and takes a firm hold of the iron, thus forming one homogenous mass of the description desired.

So far as described the construction takes place *in situ*, but this is not an essential feature of the invention, as the structures might be made up of plates or mouldings separately constructed, and bolted or otherwise fastened or jointed together or to other frames, as in the case of pipes, columns, and other manufactures: but, at the same time, where possible, it is preferable to construct the latticed concrete or cement work in its permanent position.

The accompanying drawings, illustrating the main features of this invention, will be easily understood without further reference than a description of each particular figure: Figure 1 is a plan of lattice or skeleton work, showing one manner in which the rods are laid; but it is not necessary that they should always be at right angles. Figure 2 is a section of the lattice or skeleton work surrounded by concrete or cement mortar or plastic material. Figure 3 is an isometrical drawing, showing a portion of lattice or skeleton work partly covered by concrete or cement mortar. Figure 4 is a design for roofing, according to this invention, in which the side pressure is taken up by two girders held in position by tie-rods. Figure 5 is a design for a ceiling, according to this invention, and showing an ordinary flooring for the upper storey. Figure 6 is a design for a combined floor and ceiling, according to this invention.

Having now particularly described and explained the nature of this said invention, and in what manner the same is to be performed, we declare that what we claim is—

First, as an improvement in concrete and cement mortar building and other constructions and manufactures, a material consisting of a metal lattice or skeleton work, formed of bars laid across each other and tied at their intersections, in conjunction with concrete or cement mortar or other plastic material, moulded on or around it, substantially, as herein described and explained.

Second,

Second, as an improvement in concrete and cement mortar building, and other constructions and manufactures, the formation of a metal lattice or skeleton work of bars across one another and tied at their intersections in permanent position, and the embedding of the same in concrete or cement mortar, &c., of the desired configuration, substantially, as herein described and explained.

Dated this 3rd day of November, 1892.

JOHN CARTER.  
D. G. SNODGRASS.  
W. BALTZER.

Witness,—FRED. WALSH, F.A.I.P.A.

This is the specification, marked "A," referred to in the annexed Letters Patent, granted to John Carter, David Graham Snodgrass, and William Baltzer, and dated as of the 3rd day of November, A.D. 1892.

JERSEY.

(No. 31,247.) New South Wales, The Treasury, 3rd November, 1892.  
RECEIVED from Messrs. J. Carter, D. G. Snodgrass, and W. Baltzer, the sum of £5 sterling, being the deposit required to defray the expense of granting Letters Patent for an invention, viz., Improvements in concrete and cement mortar building, and other constructions and manufactures.  
£5.

C. E. F. ROBBERDS,  
*pro* Treasurer.

PETITION FOR LETTERS PATENT.

To His Excellency the Governor of the Colony of New South Wales. (4,084.)

The humble Petition of John Carter, David Graham Snodgrass, and William Baltzer, all of North Sydney, in the Colony of New South Wales, Engineers,—  
Sheweth:—

That your Petitioners are the authors or designers, by virtue of a communication from abroad, of a certain invention or improvement to the arts or manufactures which your Petitioners desire to introduce into the Colony of New South Wales, and for which they are desirous of obtaining Letters Patent of the said Colony.

2. That communications from the Patent Office relative to this application may be forwarded to your Petitioners' agent, Mr. Edward Waters (Fred Walsh, Manager), 26 Elizabeth-street, Sydney.

3. That, in connection herewith, your Petitioners have paid to the Colonial Treasurer the sum of five pounds sterling.

4. The title of the said invention is "Improvements in concrete and cement mortar, building and other constructions and manufactures."

5. That, to the best of your Petitioners' knowledge and belief, the invention has not been publicly used or published, or offered for sale, within the Colony of New South Wales.

6. That a detailed specification of the said invention, illustrated by drawings, is annexed hereto.

Your Petitioners therefore humbly pray that your Excellency, with the advice of the Executive Council, will be pleased to grant unto them, their executors, administrators, and assigns, Letters Patent for the said invention for the term of fourteen years, in accordance with the provisions of the Act 16 Victoria, No. 24, and the Patents Law Amendment Act of 1887.

And your Petitioners will ever pray, &c.

JOHN CARTER.  
D. G. SNODGRASS.  
W. BALTZER.

Dated at Sydney, N.S.W., this 3rd day of November, 1892.

Sir,

Patents Office, Sydney, 24 January, 1893.

In the matter of the application of J. Carter, D. G. Snodgrass, and W. Baltzer, for Letters Patent.

Having examined the Petition relating to the above, I do myself the honor to report, for the information of the Minister of Justice, that I see no objection to the prayer of the Petitioners being complied with.

I have, &c.,

J. B. O'CONNOR,  
Examiner of Patents.

The Under Secretary of Justice.

MINUTE PAPER FOR THE EXECUTIVE COUNCIL.

Department of Justice, Sydney, 24 January, 1893.

Issue of Letters Patent to John Carter, David Graham Snodgrass, and William Baltzer.

HAVING examined the petition for Letters Patent from J. Carter, D. G. Snodgrass, and W. Baltzer, for an invention of "Improvements in Concrete and Cement Mortar Building and other Constructions and Manufactures," and having also examined the report thereon of the Examiner of Patents, I now approve of the prayer of the petitioners, and recommend the issue of Letters Patent, securing to the aforesaid petitioners for fourteen years the benefit of the said inventions.

R. E. O'CONNOR.

Executive Council Office, February 1, 1893.—No. 569.

The Executive Council advise that Letters Patent be issued for the invention specified.—A. C. BUDGE, Clerk of the Council. Min. 93-5, 7/2/93. Confirmed, 14/2/93. Approved.—JERSEY, 7/2/93. His Excellency the Governor and the Executive Council. Regd., 15/2/93.

LETTERS PATENT TO JOHN CARTER, DAVID GRAHAM SNODGRASS, AND WILLIAM BALTZER.

By His Excellency the Right Honorable Victor Albert George, Earl of Jersey, a member of Her Majesty's Most Honorable Privy Council, Knight Grand Cross of the Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief of the Colony of New South Wales and its Dependencies.

To all to whom these presents shall come Greeting:—

WHEREAS John Carter, David Graham Snodgrass, and William Baltzer, all of North Sydney, in the Colony aforesaid, engineers, have by their petition represented to me that they are by virtue of a communication from abroad the authors or designers of a certain invention in, or improvement to, the arts or manufactures, that is to say, of an invention of "Improvements in Concrete and Cement Mortar Building and other Constructions and Manufactures," which is more particularly described in the specification marked "A" and the two sheets of drawings marked "B" and "C" respectively, which are hereunto annexed. And that they, the said petitioners, have deposited with the Colonial Treasurer of the said Colony of New South Wales the sum of five pounds sterling, as required by the "Patents Law Amendment Act of 1887," and have prayed that I would be pleased to grant Letters Patent whereby the exclusive enjoyment and advantage of the said invention or improvement might be secured to them for a period of fourteen years. And whereas I have received a report from the Minister of Justice to the effect that, after examination of the said petition, and of the report thereon of the Examiner of Patents, the Minister of Justice approves of the prayer of the said petitioners. Now, therefore, I, being willing to give encouragement to all inventions in, and improvements to, the arts or manufactures which may be for the public good, am pleased, with the advice of the Executive Council, and in exercise of the power and authority given to me by the beforementioned Act and the Act of Council, Sixteenth Victoria Number Twenty-four, to grant, and do by these Letters Patent grant, unto the said John Carter, David Graham Snodgrass, and William Baltzer, their executors, administrators, and assigns, the exclusive enjoyment and advantage of the said invention or improvement for and during the term of fourteen years from the date hereof. To have, hold, and exercise, unto the said John Carter, David Graham Snodgrass, and William Baltzer, their executors, administrators, and assigns, the exclusive enjoyment and advantage thereof for and during and unto the full end and term of fourteen years from the date of these presents next and immediately ensuing and fully

fully to be complete and ended. In witness whereof I have hereunto set my sign manual, and have caused the present Letters Patent to be sealed with the seal of the said Colony of New South Wales, at Government House, Sydney, in New South Wales, and dated as of the third day of November in the year of our Lord one thousand eight hundred and ninety-two.

JERSEY.

REGISTERED by me and entered of Record in the Patents Office of New South Wales this 1st day of March, A.D., 1893, in pursuance of the Act 51st Victoria No. 3, section 13, No. 4,084, Book 4.

J. B. O'CONNOR,  
Examiner of Patents.

### Appendix No. 19.

#### DEED OF PARTNERSHIP—MESSRS. CARTER, GUMMOW, & Co.

THIS indenture made the twenty-fifth day of August, one thousand eight hundred and ninety-two, between John Carter, of North Sydney, in New South Wales, contractor, of the first part; David Graham Snodgrass, of North Sydney aforesaid, contractor, of the second part; George Forrest, of Waverley, Sydney, in New South Wales, contractor, of the third part; Frank Moorhouse Gummow, of Glebe Point, Sydney aforesaid, contractor, of the fourth part; James Gillan, of Dulwich Hill, Sydney aforesaid, contractor, of the fifth part; George Maddison, of Petersham, Sydney aforesaid, contractor, of the sixth part; and Peter Ewing, of Newtown, Sydney aforesaid, contractor, of the seventh part; whereas the said parties hereto have lately entered into a contract with the Government of South Australia, for the construction of certain works in or near Adelaide, in South Australia, called Contract Number 60, Inlet Tunnel, Happy Valley Waterworks; Now this indenture witnesseth that, in pursuance of the said agreement and in consideration of the confidence which the said parties have in each other, each of them, the said John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing, doth hereby for himself, his heirs, executors, and administrators (so far as the agreements and provisions hereinafter contained are or ought to be performed or observed by him, his executors, or administrators) covenant with the others of them, their executors and administrators, in the manner following, that is to say,—

1. The said parties hereto will become and remain partners under the name, style, or firm, of "Carter, Gummow, & Co.," in the trade or business of Contractors, for the purposes of carrying out and completing the contract hereinbefore referred to, and any other contracts which the said parties shall mutually agree upon and shall obtain.

2. The capital of the partnership shall be the sum of ten thousand pounds, to be contributed by the said parties in the manner following, that is to say, the sum of five thousand pounds shall be contributed by the said John Carter, David Graham Snodgrass, and George Forrest, jointly, and the sum of five thousand pounds by the said Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing, jointly.

3. The whole of the capital of the said partnership and the receipts and earnings of the said partnership business shall be employed in the said partnership business: and, in the event of the capital of the said partnership business being insufficient to carry on and complete the contracts aforesaid, then the said parties shall contribute the additional moneys necessary for such carrying on or completion in the proportions and manner in which the original capital is to be contributed.

4. All material, plant, tackle, tools, implements, machinery, goods, chattels, effects, and things, necessary and requisite in and about the construction of the works the subject of the said contracts shall be purchased, and all wages and salaries of persons employed in connection with the same works, and all other outgoings and other expenses, losses, and damages, incurred in connection with the said partnership business or in any wise relating thereto, shall be paid out of the capital receipts and earnings of the said partnership business: and, in case of deficiency, then such deficiency shall be borne as to one-half by the said John Carter, David Graham Snodgrass, and George Forrest, jointly; and as to the other half by the said Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing, jointly.

5. The partners shall be entitled to the profits of the partnership business in the following shares, that is to say, one-half to the said John Carter, David Graham Snodgrass, and George Forrest, jointly; and one-half to the said Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing, jointly: the said profits shall be divided between the said partners, so soon after the completion or determination of all the contracts, for the time being, in hand, as a general account shall have been taken, and the assets collected, and liabilities discharged, as provided in paragraph twenty of these presents.

6. During such time as any of the said partners shall be engaged or employed upon, or in connection with, the said partnership business, he shall be entitled to draw out of the partnership funds the sum of ten pounds per week, as salary for his personal services in connection with the said business; but no partner shall be allowed, or entitled to draw, any other moneys out of the partnership funds during the continuance of the partnership.

7. The bankers of the partnership shall be the Bank of New Zealand, or such other bankers as the partners shall from time to time mutually determine; and all moneys, notes, bills, and securities, which shall from time to time be received by the partners, or any or either of them, for or on account of or belonging to the partnership, shall be immediately paid to the credit of the partnership, with the bankers for the time being of the partnership, in the same drafts bills or cash in which the same are received. And all disbursements for or on account of the partnership shall be made by cheque on such bankers or through the medium of the cash clerk of the partnership.

8. All cheques, bills, and promissory notes, drawn for or on account of the partnership, shall be signed in the name of the firm by either the said John Carter or the said Frank Moorhouse Gummow.

9. None of the partners shall buy, order, or contract for, any goods or articles, or pledge the credit of the partnership, to an amount exceeding ten pounds, without the previous consent, in writing, of the others of them; and, in the event of any partner so doing, the other partner shall have the option either to take the goods or articles so bought, ordered, or contracted for, on behalf of the partnership, or to insist that the same shall remain and be for the separate use of the partner so buying, ordering, or contracting, in which case he shall pay for the same out of his own separate moneys.

10. Each partner shall be just and faithful to the other partners in all transactions relating to the business of the partnership, and shall give a true account of the same to them and each of them when and so often as the same shall reasonably be required, and shall also inform the other partners of all letters, accounts, writings, and other things, which shall come to his hands or knowledge concerning the business of the partnership, and shall also join with the other partners in doing and performing all matters and things necessary for the beneficial working of the partnership business.

11. None of the partners shall take or go upon any journey or voyage on account of the partnership without the consent of the others of them: and, if any partner shall take or go upon any journey or voyage on account of the partnership with such consent, he shall be allowed his reasonable expenses of travelling and subsistence during such voyage or journey.

12. No partner shall use any of the moneys goods or effects of the partnership, or engage the credit thereof, except upon the account and for the benefit of the partnership.

13. No partner shall, without the consent of the others, do or knowingly suffer anything whereby the property of the partnership may be seized, attached, or taken in execution.

14. No partner shall, without the previous consent in writing of the other partners, assign alienate or encumber his share or interest in the partnership.

15. No partner shall, without the written consent of the others of them, compound or release any debt or right which shall be due or owing or belonging to, or any action brought by, the partnership: and, if any partner shall so do, he shall if required pay to the partnership the full amount or value of the debt, right, or claim, which he shall so release or compound for.

16. Each partner shall punctually pay and discharge his present and future separate and private debts and engagements, and shall at all times keep indemnified the other partners and their executors and administrators and the property of the partnership against the same, and all actions proceedings and claims and demands in respect thereof.

17. Proper books of account shall be kept by the partners, and entries shall be made therein of all such matters transactions and things as are usually and properly entered in books of account kept by persons engaged in concerns of a similar nature. And the same shall be posted up quarterly or as near thereto as practicable, and signed by all the partners, and when so signed shall be binding on all the partners; except that, if any manifest error shall be discovered in any such account, and shall be signified by any partner to the others within one calendar month after signing of such account, such

error

error shall be rectified. And the said books of account, and all letters, papers, and documents, belonging to the partnership, except such as are to be kept at the bankers, shall be kept at the principal office of the partnership, and each partner shall at all times have free access to examine and copy the same.

18. In the event of the death of any of the partners, the executors or administrators of such deceased partner shall be at liberty to appoint some person, to be approved of by the other partners, to assist in the management of the partnership business, and completion of the said contracts. Provided always that if there shall be any dispute or difference as to the person to be so appointed such dispute or difference shall be settled by arbitration as hereinafter provided.

19. In the event of the death of any partner, his executors or administrators shall be entitled to require the payment to the estate of such deceased partner of an allowance, not exceeding six pounds per week until the completion of the said contracts, provided the prospects and finances of the partnership are such that such allowance can be paid without causing any loss to the said partnership, and such allowance shall not be deemed to be paid on account of, but shall be in addition to, the share to which such deceased partner or his estate would be entitled on the winding up and final distribution of the assets of the partnership.

20. Upon the completion of all the contracts for the time being in hand, or upon the happening of any event rendering it impracticable for the partnership to carry out and complete the same, whichever shall first happen, the partnership shall be dissolved, and a general account taken of the assets and liabilities of the partnership, and ; with all convenient speed, the assets shall be realised, and the debts due to the partnership collected and got in ; and the proceeds shall be applied in discharge of the liabilities of the partnership, and the expense of liquidating the same and realising the assets thereof, and, in the next place, in payment to the partners, or their respective representatives, of the proportionate parts of the capital contributed by the partners respectively : and the surplus (if any) of the moneys realised as aforesaid shall be divided between the partners, or their representatives, in the shares in which the partners are interested in the profits of the partnership, as provided by the fifth paragraph of these presents : and each partner, or his representatives, shall execute such release to the other partners, or their representatives, from all claims on account of the partnership as is usual and proper in such cases.

21. In case any of the partners shall be guilty of any wilful breach of or fail or neglect to observe all or any of the provisions herein contained, for the space of twenty-one days after having received notice in writing from the other partners to fulfil the same, the defaulting partner shall, at the election of the other partners, be deprived of having any voice in the management of the partnership business, and shall not be entitled to any salary or allowance during such deprivation : and in any such case the other partners shall be at liberty to carry on and complete the said contracts and to all things necessary therefor, without any hindrance or interference from or by the said defaulting partner, and shall be at liberty to receive and give discharges for all moneys payable to the partnership, and pay all debts due by the partnership. And, if it shall seem fit to the other partners, they may, in their discretion, remove the disability of the defaulting partner and restore him to all the rights and privileges of partnership.

22. If any dispute or difference shall at any time arise between the partners, or their executors or administrators, or between the executors or administrators of any deceased partner or partners and the surviving partners or partner, or any of them, touching the partnership or any matter or thing relating thereto, then the dispute, matter, or difference, shall be determined by arbitration, under the provisions of the Arbitration Act of 1892 or other the enactments for the time being in force relating to arbitration.

IN WITNESS whereof the said parties to these presents have hereunto set their hands and seals the day and year first above written :—

|  |                  |
|--|------------------|
| Signed, sealed, and delivered, by the said John Carter, in the presence of,— | JOHN CARTER.     |
| A. W. SNODGRASS.   |                  |
| By the said David Graham Snodgrass, in the presence of,—                     | D. G. SNODGRASS. |
| A. W. SNODGRASS.   |                  |
| By the said George Forrest, in the presence of,—                             | GEO. FORREST.    |
| A. W. SNODGRASS.   |                  |
| By the said Frank Moorhouse Gummow, in the presence of,—                     | F. M. GUMMOW.    |
| A. W. SNODGRASS.   |                  |
| By the said James Gillan, in the presence of,—                               | J. GILLAN.       |
| A. W. SNODGRASS.   |                  |
| By the said George Maddison, in the presence of,—                            | GEORGE MADDISON. |
| A. W. SNODGRASS.   |                  |
| And by the said Peter Ewing, in the presence of,—                            | PETER EWING.     |
| A. W. SNODGRASS.   |                  |

### Appendix No. 20.

NOTICE is hereby given that the partnership lately subsisting between us, the undersigned, John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing, as Contractors, carrying on business in Adelaide (South Australia) and Sydney (New South Wales), under the name style or firm of Carter, Gummow, & Co., was on the first day of April, 1895, dissolved by mutual consent in so far as regards the said George Maddison and Peter Ewing, who retired as from that date from the said firm. All debts due to or owing by the said firm will be received and paid by the said John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, and James Gillan, who continue the business under the same style of Carter, Gummow, & Co.

As witness our hands, this first day of April, A.D. 1895.

F. M. GUMMOW.  
JOHN CARTER.  
D. G. SNODGRASS.  
JAMES GILLAN.  
GEORGE FORREST.  
GEORGE MADDISON.  
PETER EWING.

### Appendix No. 21.

Department of Public Works, Roads, Bridges, and Sewerage Branch.

#### TENDER FORM.

IN pursuance of advertisement in the *Government Gazette* (I or we), the undersigned, do hereby tender to provide the material and perform the various works required in and about the full and proper construction, erection, and completion of the Western Outfall Sewer Extension, 4th Division (Contract No. 112), agreeably to the Plans, Specification, Schedule to Specification, Special Condition, and General Conditions, which have been inspected by (me or us), at \_\_\_\_\_ per cent.\*

the prices affixed to each item, in the Schedule of Quantities and Prices annexed hereto, and to complete the same within twenty months from the date of the acceptance of this Tender ; and (I or we) do hereby agree that any additions to or deductions from the said works shall be paid or allowed for, as the case may be, at and after the rates quoted above, or if not in Schedule, at a price to be agreed upon at the time, and (I or we) hereby undertake that (I or we) will, within fourteen days from the date of notification of the acceptance of the said Tender, execute and deliver to the Minister for Public Works, a valid legal Contract with Her Majesty the Queen, embodying the Terms and Conditions above mentioned, and to provide the security required by clause 29 of the said General Conditions ; and (I or we) enclose herewith (our or my) cheque for the sum of £ \_\_\_\_\_ as a preliminary deposit ; and (I or we) agree that such sum shall be absolutely forfeited

\*Here insert "under" or above, as the case may be, or erase the words "per cent." if the party is desirous to abide by the prices affixed.



forfeited if (I or we) at any time within thirty days after the said Tender is opened, withdraw the same, or if in the event of this tender being accepted (I or we) fail to complete the above-mentioned Contract within fourteen days thereafter ; and, further, that this tender is made subject to the Conditions contained in the Tender Board Regulations, printed on the back hereof, and by which (I or we) agree to be bound.

Witness—  
 Dated this \_\_\_\_\_ day of \_\_\_\_\_ 189 .  
 This is the Tender marked “ \_\_\_\_\_ ”, referred to in the annexed Agreement with Her Majesty the Queen,  
 dated the \_\_\_\_\_ day of \_\_\_\_\_ A.D. 189 .  
 Witness—

Insert date.  
 Signature of party tendering here, with address. In the case of a firm tendering, the name and address of each member must be given in full.

*Tender Board Regulations.*

No Tender shall be received after 11 a.m. on the day named for the receipt of such Tender, unless there are circumstances which, in the opinion of the Members of the Board then sitting, render it desirable to do so.

It shall be the duty of the President, Vice-President, or the senior member present, as the case may be, as soon as the Tenders shall have been opened and the necessary particulars ascertained, to publicly announce the number of Tenders received for each work, and the name of the lowest Tenderer ; but no Tender shall be accepted until the Head of the Branch, under whose directions the work is to be carried out, has reported upon the whole of the Tenders received.

The Secretary shall, as soon as practicable after the Board has adjourned, exhibit in a conspicuous position, in the Public Works Office, a full statement of the Tenders received, showing the work, the name of the Tenderer, and the amount of each Tender.

All envelopes containing Tenders must be addressed to the President of the Board, and have legibly endorsed upon them the name of the work for which the Tender is submitted.

Every Tender must, as a guarantee of good faith, be accompanied by a preliminary deposit, calculated according to the following scale, viz. :—

|  |         |
|--|---------|
| For amounts up to £500 inclusive ... ..                    | £5 0 0  |
| For amounts exceeding £500 and not exceeding £1,000 ... .. | £10 0 0 |

For all sums over £1,000 one per cent. on the amount of Tender up to a maximum deposit of £500. Such deposit to be in the form of a cheque in favour of the President of the Board, endorsed by the Manager of the Bank upon which it is drawn, or a Bank draft.

All deposits, with the exception of that of the successful Tenderer, shall be returned by the Secretary to the person entitled thereto, as soon as possible after the Board shall have adjourned, and the deposit made by the successful Tenderer shall be returned to him on his executing the bond for the fulfilment of the Contract. When the Contract is for a less sum than £200 the deposit with Tender shall not be returnable until the service is satisfactorily completed.

Any Tender which may be received without such preliminary deposit shall, unless otherwise directed by the Board, be deemed to be informal, and rejected accordingly.

In the event of any Tenderer failing to take up his Tender, complete the bond, and proceed with the Contract within the time specified, or withdrawing his Tender after it shall have been opened, whether such Tender shall have been accepted or not, all moneys deposited by him on account thereof, or in connection therewith, shall be forfeited to the Crown, and in such case be paid to the credit of the Consolidated Revenue of the Colony.

Whenever a Tenderer shall fail to proceed with a Contract as aforesaid, fresh Tenders shall be invited at short notice for the work, unless in the opinion of the President there are circumstances which make it desirable for another Tender in the same series to be accepted ; but the Tenderer by whose default such a course has been rendered necessary shall be excluded from the competition, and from any competition for other works, at the pleasure of the President.

In submitting a Tender, the full Christian name of the Tenderer must be given, or when the offer is in the name of a firm, the names in full of each member. When bondsmen are required, the names in full, occupations, and addresses must be stated in the Tender. The omission of this information will render the Tender liable to be declared informal.

The Board shall not be bound to accept the lowest or any Tender.

The Board-room shall be open for the admission of the public while the Tenders are being opened and declared.

CONTRACT No. 112.

THIS is the Schedule of quantities and prices hereinbefore referred to.

| No. of Item. | Description of Works.  | Unit.       | Probable Quantity. | Rate per Unit.   |
|--------------|--|-------------|--------------------|------------------|
| 1            | Excavation in open trenches in sand, mud, clay, for foundations of main and branch carriers, straining chambers, abutments for Muddy Creek bridge, piers of arches of aqueduct, offset-pipes, &c., including removing any pitching, masonry, brick or concrete work, logs, drains, &c., met with in excavations, as specified in clauses 3, 6, and 7 .....   | cubic yard  | 4,400              | £ s. d.<br>0 3 0 |
| 2            | Filling in all excavations round all concrete foundations of piers, abutments, straining chambers, main carrier, round pipe-sewers, and in any situation in the construction of these works, including all sand filling, as specified in clauses 4, 6, 7 .....   | "           | 1,820              | 0 0 6            |
| 3            | Removal of surplus materials from all excavations, as specified in clause 5 .....  | "           | 2,580              | 0 0 6            |
| 4            | Timber ordered in writing to be left in excavations, as specified in clause 6, including all iron used in fixing same. ....  | cubic foot  | 1,000              | 0 1 9            |
| 5            | Supplying and fixing hardwood round timber in piles where ordered, including and fixing all iron shoes and other iron-work used in driving same, as specified in clause 6 .....  | lineal foot | 10,400             | 0 3 6            |
| 6            | Sandstone ballast of the description specified in clause 202 of the schedule to specification, provided and packed solid, 4 feet thick, between heads of piles, when directed .....  | cubic yard  | 740                | 0 5 0            |
| 7            | Supplying, placing in position, sawn hardwood turpentine timber in floor joists, plank floors, and where ordered, including all iron-work required in fixing same, and tarring, as specified in clauses 2, 16, and 18 .....  | cubic foot  | 145                | 0 3 6            |
| 8            | Sandstone concrete, in any situation, in any shape, form, thickness, with pear-shaped openings in spandrels, including providing and placing in position and jointing bitumen and cork plates and mastic plates, as specified in clauses 7 and 8 .....   | cubic yard  | 3,125              | 1 8 0            |
| 9            | Bluestone concrete, in any situation, in any shape, form, or thickness, moulded, curved in skewbacks of piers, in abutments of bridge, in inverts, side, and division walls of straining chambers, in 50-ft. span arches, and where ordered, including providing, placing in position, and jointing val-de-travers asphalt plates and mastic plates, as specified in clauses 7 and 8 .....   | "           | 2,010              | 2 5 0            |
| 10           | Special bluestone concrete, in any shape, form, or thickness, panelled, weathered, curved, in invert and sides of main carrier, including the providing, placing in position, jointing, walling in the wrought-iron vertical, transverse, and longitudinal bond-rods, longitudinal $\square$ , and $\perp$ iron braces, screw-bolts, and vertical transverse mastic plates and circular and rectangular mastic bars, as specified in clauses 7 and 8 ... | "           | 1,820              | 2 15 0           |

| No. of Item.  | Description of Work.  | Unit.       | Probable Quantity. | Rate per Unit.    |
|---|---|-------------|--------------------|-------------------|
| 11  | Brickwork in cement in dwarf walls, under main carrier, under No. 2 straining chamber, under stone stairs, and where ordered, as specified in clause 10 .....   | cubic yard  | 116                | £ s. d.<br>1 15 0 |
| 12  | Monier plates, receiving, placing in position upon brick walls, set upon and in cement mortar and jointing, as specified in clauses 2, 7, and 8 .....   | square yard | 233                | 0 1 0             |
| 13  | Cement facing, 1 to 2, in any situation where ordered, as specified in clause 9 .....   | "           | 12,080             | 0 2 0             |
| 14  | Special cement facing, 1 to 1, to all internal concrete surfaces of main carrier, as specified in clause 9 .....  | "           | 4,525              | 0 2 3             |
| 15  | Freestone ashlar in steps, stone blocks, and where ordered, set in cement, as specified in clause 11 .....  | cubic foot. | 100                | 0 3 0             |
| 16  | Bluestone ashlar in imposts, bedstones, in weir-crests, and in stop-blocks, set in cement, as specified in clause 11.....   | "           | 65                 | 0 5 0             |
| IRONWORK.   |   |             |                    |                   |
| Manufacture, supply, place in position, erect, lay, joint, and fix, with all rivets, screwbolts, anchor-bolts, lead, and spun-yarn (except where otherwise specified and directed), all wrought-iron, steel, gun-metal, cast-steel, and cast-iron work, including painting, tarring, and tar-varnishing, complete, as shown on drawings, and as specified in clauses 12 to 20 (inclusive) as, viz. :- |   |             |                    |                   |
| 17  | Wrought-iron trough bridge over Muddy Creek, 77 ft. 4 in. in length over all, including handrails over bridge and abutments, weighing in all 26 tons 10 cwt. 1 qr. 10 lb.....   | ton .....   | 26 10 1 10         | 22 10 0           |
| 18  | Hinge, bearing on rollers on western abutment, consisting of cast-steel bed-plate, rollers, and bearing-plate, wrought-iron frame, cast-iron bearing-plate, below and above, steel-pin, &c., complete, weighing in all 5 cwt. 2 qr. 18 lb. ....   | each .....  | 2                  | 15 17 0           |
| 19  | Hinge, bearing on eastern abutment, consisting of cast-iron bearing-plates, steel-pin, anchor-bolts, washer plate, and cotter key, weighing in all 3 cwt. 1 qr. 11 lb. ....   | "           | 2                  | 7 0 0             |
| 20  | Wrought-iron stairs or ladder, at abutment of bridge, complete, with cast-iron steps, wrought-iron stringers, and handrail, weighing in all 12 cwt. 3 qr. 11 lb. ....   | "           | 2                  | 15 1 4            |
| 21  | Three sluice-gates at end of triplicate sewer, of 6 feet diameter, with all screwbolts, cast-iron frames, wrought iron top girders, 50'6 cubic feet of sawn turpentine-wood in bottom sills, and sluice-gates, with wrought-iron fittings and fixings, one Weston block and chain for lifting gates, complete, weighing in all (including timber), 3 tons 16 cwt. 2 qr. 23 lb. .... | total ..... | 3 16 2 23          | 80 0 0            |
| 22  | Sluice-gate for 6 ft. by 2 ft. 6 in. inlet of straining chamber No. 1, with cast-iron frame, guides, standard, handwheel, wrought-iron handles, screw and anchor-bolts, spindle, gun-metal fittings, 6'27 cubic feet of sawn turpentine-wood bottom sill and sluice-gate, complete with all lifting gear, weighing in all (including timber) 13 cwt. 2 qr. 16 lb....                | each        | 4                  | 21 3 8            |
| 23  | Sluice-gate (without lifting gear) for 3 ft. 9 in. wide inlet of branch-carrier at No. 1 straining chamber, with cast-iron frame, wrought iron top girder, 6'2 cubic feet of sawn turpentine-wood bottom sill and sluice-gate, complete with L iron guides and screw-bolts, weighing in all (including timber) 12 cwt. 3 qr. 17 lb. ....  | "           | 1                  | 15 0 0            |
| 24  | Sluice-gate (without lifting gear), with 8'4 cubic feet of sawn turpentine wood in sluice-gate, similar to item 23, but for 5-foot wide inlet of branch-carrier at No. 1 straining chamber, weighing in all (including timber) 14 cwt. 1 qr. 15 lb.....   | "           | 1                  | 16 0 0            |
| 25  | Sluice-gate for 5 ft. 4 in. wide outlets of No. 1 straining chamber, with 8'8 cubic feet of sawn turpentine-wood in sluice-gate, similar to items Nos. 23 and 24, but with wrought-iron, cast-iron, and gun-metal lifting gear, complete, weighing in all (including timber), 16 cwt. 2 qr. 2 lb. ....  | "           | 2                  | 20 15 0           |
| 26  | Sluice-gate for 4-ft. 6-in. wide inlets and outlets of straining chamber No. 2, and inlets to carriers, with 7'2 cubic feet of sawn turpentine-wood in sluice-gate, similar to item 25, with wrought-iron, cast-iron, and gun-metal lifting gear, complete, weighing in all (including timber) 14 cwt. 3 qr. 25 lb. ....  | "           | 8                  | 19 4 0            |
| 27  | Wrought-iron strainer for No. 2 straining chamber, with cast-iron standard, coverplates, bedplate, wheels, plummer-block, counter-balance weight, wrought-iron axle, spindle, brackets, screw and anchor-bolts, gun-metal work, complete with all gearing, weighing in all 1 ton 11 cwt. 2 qr. ....   | "           | 3                  | 43 6 1            |
| 28  | Cast-iron off-let valve at ends of triplicate sewer, and at end of straining chamber No. 1, of 9 in. internal diameter, with frame, sawn and planed turpentine-wood valve-blade lifting gear, and all wrought-iron and gun-metal work, complete, weighing in all (including timber) 1 cwt. 3 qr. 18 lb. ....  | "           | 5                  | 5 0 0             |
| 29  | Cast-iron flanged and spigot pipe of 2 in. internal diameter, 24 in. long, round spindle of 9 in. off-let valve, weighing in all 1 qr. 5 lb. ....   | "           | 3                  | 0 5 0             |
| 30  | Cast-iron flanged, spigot and faucet, bent, junction, and straight pipes, of 9 in. and 12 in. internal diameter, for off-lets to the 9-in. diameter valves, including all screw-bolts, laying and jointing, complete, weighing in all 3 tons 17 cwt. 2 qr. 19 lb. ....  | ton         | 3 17 2 19          | 12 0 0            |
| 21  | Cast-iron penstock for weir chambers of western abutment of bridge, of 18 in. internal diameter, with frame, standard, lifting gear, all wrought-iron and gun-metal work, complete, weighing in all 7 cwt. 3 qr. 10 lb.....   | each        | 2                  | 16 9 3            |
| 32  | Cast-iron flanged, spigot, bent, junction, and straight pipes, of 18 in., 20 in., and 27 in. internal diameter, for storm-water off-let to the 18-in. diameter penstocks, including all screw-bolts, laying and jointing, complete, weighing in all 4 tons 7 cwt. 3 qr. ....  | ton         | 4 7 3 0            | 12 0 0            |

| No. of Item. | Description of Work.  | Unit.      | Quantity.  | Rate.             |
|--------------|---|------------|------------|-------------------|
| 33           | Wrought-iron floor girders over straining chambers Nos. 1 and 2, and over weir chambers, consisting of 30 feet of 6 in. by 3 in. I iron girders, and 264 feet of 4-in. by 4-in. I iron girders, including allowances for crossings, end plates, joints, and screw-bolts, complete, weighing in all 1 ton 19 cwt. 0 qr. 7 lb. ....   | ton        | 1 19 0 7   | £ s. d.<br>18 0 0 |
| 34           | Cast-iron floor-plates over straining chambers, consisting of 26 plates of different dimensions over No. 1 straining chamber, and 27 plates of different dimensions over No. 2 straining chamber, laid in position, complete, weighing in all 11 tons 16 cwt. 3 qr. 16 lb. ....   | "          | 11 16 3 16 | 12 9 6            |
| 35           | Galvanised $\frac{3}{4}$ -inch wrought-iron pipe handrail, 122 lineal feet over No. 1 straining chamber, and 100 lineal feet over No. 2 straining chamber, fitted with jagged ends where shown, with solid circular wrought-iron straight standards, with forged foot-plates, short and bent standards with jagged ends at stone stairs, including all screw-bolts, and fixed as shown, complete, weighing in all 17 cwt. 2 qr. 18 lb. .... | total      | 0 17 2 18  | 37 1 9            |
| 36           | Wrought-iron rake for straining chamber, with wooden handle, as shown, complete. ....   | each       | 1          | 0 12 6            |
| 37           | Special bluestone concrete, in any situation, as specified in clause 2  | cubic yard | Rate only  | 3 5 0             |
| 38           | Bluestone metal, $1\frac{1}{2}$ -in. gauge, stacked   | "          | "          | 0 12 0            |
| 39           | Sandstone metal, 2-in. gauge, stacked   | "          | "          | 0 4 0             |
| 40           | Bluestone metal, $2\frac{1}{2}$ -in. gauge, stacked   | "          | "          | 0 12 0            |
| 41           | Sharp, clean, washed sand (clause 2), stacked   | "          | "          | 0 7 6             |
| 42           | Sawn hardwood, in scantlings or planks (clause 2)   | cubic foot | "          | 0 2 9             |
| 43           | Oregon timber, in scantlings or planks  | "          | "          | 0 2 9             |
| 44           | Wrought-iron, in bolts, screws, nails, spikes, straps, &c. (clause 2)   | cwt.       | "          | 1 10 0            |
| 45           | Portland cement   | cask       | "          | 0 12 6            |
| 46           | Artisan or mechanic, supplied by contractor   | day        | "          | 0 11 0            |
| 47           | Quarryman or other skilled labourer, supplied by contractor   | "          | "          | 0 8 0             |
| 48           | Ordinary labourer, supplied by contractor   | "          | "          | 0 7 0             |
| 49           | Cart, with one horse and driver, supplied by contractor   | "          | "          | 0 11 0            |
| 50           | One additional horse, supplied by contractor  | "          | "          | 0 5 6             |

The quantities are not guaranteed as correct, and are merely for the guidance of tenderers, being subject to omissions, deductions, alterations, and additions.

All work herein enumerated shall be understood as being placed in position where specified and ordered, and in complete working condition, in accordance with the specification.

The above schedule prices include, in every case, continual maintenance of the works during the whole time of construction, and up to the day of their being formally taken over by the Engineer.

Prices for items Nos. 46, 47, 48, 49, and 50 are to be for such as are able-bodied and efficient. The schedule rates per day are for the day of eight hours. In the event of overtime and night-work being ordered, it is to be paid for at 25 per cent. advance on the time rates set down for day-work.

The whole of the foregoing prices to include all labour, tools, implements, plant, machinery, shoring, timbering, centering, concrete boxes, unwatering, coffer dams, fluming, temporary bridges, roads, pumping, gasket filling, diverting water-courses and surface water, diverting and maintaining the traffic along roads crossing over pipe sewers, disposal and removal of surplus materials on completion of contract, reinstating all roads and other surfaces, &c., and any other thing necessary in executing and completing each respective item, in accordance with plans and specification.

### Appendix No. 22.

Department of Public Works, Roads and Bridges and Sewerage Branch.

#### TENDER FORM.

IN pursuance of advertisement in the *Government Gazette* (I or we), the undersigned, do hereby tender to provide the material and perform the various works required in and about the full and proper construction, erection, and completion of the western outfall sewer, 3rd Division (Contract No. 101), agreeably to the Plans, Specification, Schedule to Specification, and General Conditions, which have been inspected by (me or us), for or at the rates entered in the Schedule of Quantities and Prices annexed hereto, and to complete the same within fifteen months from the date of the acceptance of this Tender; and (I or we) do hereby agree that any additions to or deductions from the said works shall be paid or allowed for, as the case may be, at and after the rates or prices mentioned in the Schedule of Quantities and Prices annexed hereto, or if not in Schedule, at a price to be agreed upon at the time, and (I or we) hereby undertake that (I or we) will, within fourteen days from the date of notification of the acceptance of the said Tender, execute and deliver to the Minister for Public Works a valid legal contract with Her Majesty the Queen, embodying the terms and conditions above mentioned, and to provide the security required by clause 29 of the said General Conditions; and (I or we) enclose herewith (our or my) cheque for the sum of £ \_\_\_\_\_ as a preliminary deposit; and (I or we) agree that such sum shall be absolutely forfeited if (I or we) at any time within thirty days after the said Tender is opened withdraw same, or if in the event of this Tender being accepted (I or we) fail to complete the above-mentioned Contract within fourteen days thereafter; and further, that this Tender is made subject to the Conditions contained in the Tender Board Regulations, printed on the back hereof, and by which (I or we) agree to be bound.

Witness— Dated this \_\_\_\_\_ day of \_\_\_\_\_ 189 \_\_\_\_ . Insert date.

#### Tender Board Regulations.

No Tender shall be received after 11 a.m. on the day named for the receipt of such Tender, unless there are circumstances which, in the opinion of the members of the Board then sitting, render it desirable to do so.

It shall be the duty of the President, Vice-President, or the senior member present, as the case may be, as soon as the Tenders shall have been opened and the necessary particulars ascertained, to publicly announce the number of Tenders received for each work and the name of the lowest Tenderer; but no Tender shall be accepted until the Head of the Branch, under whose directions the work is to be carried out, has reported upon the whole of the Tenders received.

The Secretary shall, as soon as practicable after the Board has adjourned, exhibit in a conspicuous position, in the Public Works Office, a full statement of the Tenders received, showing the work, the name of the Tenderer, and the amount of each Tender.

All envelopes containing Tenders must be addressed to the President of the Board, and have legibly endorsed upon them the name of the work for which the Tender is submitted.

Every

Every Tender must, as a guarantee of good faith, be accompanied by a preliminary deposit, calculated according to the following scale, viz. :—

|   |         |
|---|---------|
| For amounts up to £500 inclusive                    | £5 0 0  |
| For amounts exceeding £500 and not exceeding £1,000 | £10 0 0 |

For all sums over £1,000, 1 per cent. on the amount of Tender up to a maximum deposit of £500. Such deposit to be in the form of a cheque in favour of the President of the Board, endorsed by the Manager of the Bank upon which it is drawn, or a Bank draft.

All deposits, with the exception of that of the successful Tenderer, shall be returned by the Secretary to the person entitled thereto as soon as possible after the Board shall have adjourned, and the deposit made by the successful Tenderer shall be returned to him on his executing the bond for the fulfilment of the Contract. When the Contract is for a less sum than £200 the deposit with Tender shall not be returnable until the service is satisfactorily completed.

Any Tender which may be received without such preliminary deposit shall, unless otherwise directed by the Board, be deemed to be informal, and rejected accordingly.

In the event of any Tenderer failing to take up his Tender, complete the bond, and proceed with the Contract, within the time specified, or withdrawing his Tender after it shall have been opened, whether such Tender shall have been accepted or not, all moneys deposited by him on account thereof or in connection therewith shall be forfeited to the Crown, and in such case be paid to the credit of the Consolidated Revenue of the Colony.

Whenever a Tenderer shall fail to proceed with a Contract as aforesaid, fresh Tenders shall be invited at short notice for the work, unless in the opinion of the President there are circumstances which make it desirable for another Tender in the same series to be accepted; but the Tenderer by whose default such a course has been rendered necessary shall be excluded from the competition, and from any competition for other works, at the pleasure of the President.

In the event of any Contract being tendered for at a Schedule of Rates, the approximate quantities as given of each item must be worked out and a total sum shown.

In submitting a Tender, the full Christian name of the Tenderer must be given, or, when the offer is in the name of a firm, the names in full of each member. When bondsmen are required, the names in full, occupations, and addresses must be stated in the Tender. The omission of this information will render the Tender liable to be declared informal.

The Board shall not be bound to accept the lowest or any Tender.

The Board-room shall be open for the admission of the public while the Tenders are being opened and declared.

THIS IS THE SCHEDULE OF QUANTITIES AND PRICES HEREINBEFORE REFERRED TO.

| No. of Item. | Description of Work.   | Unit.       | Quantity.     | Rate.            |
|--------------|--|-------------|---------------|------------------|
| 1            | Excavation in piers and open cutting, as specified in clause 3.....  | cubic yard  | 4,600         | £ s. d.<br>0 1 6 |
| 2            | Filling in at sides of piers and embankments, as specified in clause 4 ...   | "           | 3,900         | 0 0 6            |
| 3            | Supplying and depositing sandstone, 4-inch gauge, on road surfaces, including blinding, as specified in clause 6 .....   | "           | 550           | 0 3 0            |
| 4            | Supplying and fixing hardwood round timber in piles, including the providing and fixing of iron shoes and other ironwork used in fixing same, as specified in clause 5 ..... | lineal feet | 7,400         | 0 4 0            |
| 5            | Supplying and fixing sawn hardwood timber platform, including ironwork required in fixing same, as specified in clause 5 .....   | cubic feet  | 2,850         | 0 3 0            |
| 6            | Timber ordered (in writing) to be left in excavation, including ironwork used in fixing same, as specified in clauses 115 and 117 of the Schedule specification .....        | "           | 500           | 0 2 6            |
| 7            | Sandstone concrete in any situation, as specified in clause 9 .....  | cubic yard  | 8,700         | 1 8 0            |
| 8            | Bluestone concrete in any situation, as specified in clause 9.....   | "           | 4,180         | 1 14 0           |
| 9            | Brickwork in any situation, as specified in clause 11.....   | "           | 2,370         | 2 4 0            |
| 10           | Cement coating in any situation, as specified in clause 10 .....   | square yard | 17,800        | 0 2 3            |
| 11           | Supplying, depositing, and rolling tarred metal deck 1½-in. thick, as specified in clause 7 .....  | "           | 230           | 0 2 0            |
| 12           | Receiving and fixing ironwork supplied by the Government .....   | cwt. ...    | 82.76         | 0 5 0            |
| 13           | Removing surplus materials to where ordered within half-mile of site of excavation, including spreading same .....   | cubic yard  | 700           | 0 1 6            |
| 14           | Sandstone metal, 2½-in. gauge, stacked .....   | "           | 15            | 0 4 6            |
| 15           | Bluestone metal, 2½-in. gauge, stacked .....   | "           | 15            | 0 12 6           |
| 16           | Sharp clean washed sand, stacked .....   | "           | 100           | 0 5 0            |
| 17           | Sawn hardwood, in scantling or planks .....  | cubic feet  | 100           | 0 3 0            |
| 18           | Oregon timber, in scantling or planks .....  | "           | 100           | 0 3 0            |
| 19           | Baltic or yellow deal, in scantling or planks .....  | "           | 100           | 0 3 0            |
| 20           | Wrought-iron in bolts, step-irons, &c. ....  | cwt. ...    | 20            | 2 0 0            |
| 21           | Portland cement .....  | cask ...    | 25            | 0 15 0           |
| 22           | Artisan or mechanic .....  | day ...     | Rate only ... | 0.14 0           |
| 23           | Quarryman or other skilled labourer .....  | " ...       | " ...         | 0 10 0           |
| 24           | Ordinary labourer .....  | " ...       | " ...         | 0 9 0            |
| 25           | Horse, cart, and driver .....  | " ...       | " ...         | 0 15 0           |
|              | Total .....  | £ .....     | .....         | .....            |

Notes.

1. The quantities are not guaranteed as correct, and are merely for the guidance of Tenderers, who must satisfy themselves as to their accuracy, which is not in any way guaranteed by the Government, and they are subject to omissions, deductions, and alterations.

2. All work herein enumerated shall be understood as being placed in position where specified and ordered, and in complete working condition, in strict accordance with the specification.

3. The above Schedule prices include, in every case, continual maintenance of the works during the whole time of construction during the specified period of maintenance, and up to the day of their being formally taken over by the Engineer.

4. Prices for items Nos. 14, 15, 16, 17, 18, 19, 20, and 21 are to be for materials in strict accordance with specification, delivered on the works ready for use, and only the actual net quantities ordered and approved of shall be paid for. In case Contractor's prices are considered too high by the Engineer at the time such materials may be required, or if the Contractor fail to deliver such materials at the time required and ordered, then the Engineer shall have the power to supply the same from any other source, and the Contractor shall have no claim for loss or compensation on account of the exercise of such power by the Engineer.

5. Prices for items Nos. 22, 23, 24, and 25 are to be for such as are able-bodied and efficient. The Schedule rates per day are for the day of eight hours. In the event of overtime and nightwork being ordered, it is to be paid for at 25 per cent. advance on the time rates set down for day-work.

Appendix No. 23.

RETURN of Payments made to Messrs. Carter, Gummow, & Co., on account of Sewerage Contracts during period 1892 to 1896 inclusive.

| <i>Western Suburbs Drainage Works, from near Premier-street to near Emily-street.</i> |             |             |             |                  | <i>Northern Main Sewers, Leichhardt and Annandale Sections.</i> |             |             |             |                  |
|---|-------------|-------------|-------------|------------------|---|-------------|-------------|-------------|------------------|
| Cont. No.   | Advance No. | Amount.     | Voucher No. | Date of Payment. | Cont. No.   | Advance No. | Amount.     | Voucher No. | Date of Payment. |
| 69  | 1           | £ 2,610 0 0 | 791         | 28 Feb., 1894    | 77  | 1           | £ 666 10 2  | 1,407       | 17 Sept., 1895   |
|   | 2           | 3,440 0 0   | 1,242       | 29 Mar., 1894    |   | 2           | 723 9 2     | 1,926       | 17 Oct., 1895    |
|   | 3           | 3,710 0 0   | 1,587       | 24 April, 1894   |   | 3           | 1,228 8 10  | 2,901       | 29 Nov., 1895    |
|   | 4           | 4,720 0 0   | 2,431       | 12 June, 1894    |   | 4           | 1,375 19 2  | 3,348       | 20 Dec., 1895    |
|   | 5           | 4,130 0 0   | 2,642       | 23 ,, 1894       |   | 5           | 1,136 13 10 | 8,960       | 21 Jan., 1896    |
|   | 6           | 4,050 0 0   | 3,168       | 30 July, 1894    |   | 6           | 1,225 15 6  | 4,519       | 19 Feb., 1896    |
|   | 7           | 2,970 0 0   | 3,635       | 29 Aug., 1894    |   | 7           | 788 11 8    | 5,069       | 17 Mar., 1896    |
|   | 8           | 4,607 10 0  | 4,057       | 24 Sept., 1894   |   | 8           | 1,046 10 9  | 5,679       | 16 April, 1896   |
|   | 9           | 2,040 0 0   | 4,589       | 30 Oct., 1894    |   | 9           | 755 0 5     | 6,366       | 16 May, 1896     |
|   | 10          | 2,667 10 0  | 4,937       | 24 Nov., 1894    | <i>Johnstone's Creek Stormwater Channel.</i>                    |             |             |             |                  |
|   | 11          | 2,290 0 0   | 5,356       | 27 Dec., 1894    | 118   | 1           | 1,308 15 3  | 1,408       | 17 Sept., 1895   |
|   | 12          | 2,935 10 0  | 435         | 29 Jan., 1895    |   | 2           | 2,087 4 8   | 1,954       | 18 Oct., 1895    |
|   | 13          | 1,860 0 0   | 967         | 27 Feb., 1895    |   | 3           | 2,457 13 10 | 2,351       | 8 Nov., 1895     |
|   | 14          | 2,129 10 0  | 1,467       | 25 Mar., 1895    |   | 4           | 1,244 7 3   | 3,128       | 11 Dec., 1895    |
|   | 15          | 2,420 0 0   | 2,701       | 7 June, 1895     |   | 5           | 937 19 5    | 4,861       | 9 Mar., 1896     |
|   | 16          | 1,520 0 0   | 468         | 26 July, 1895    | <i>Outfall Works at North Shore, Willoughby Bay.</i>            |             |             |             |                  |
|   | 17          | 4,030 0 0   | 2,173       | 31 Oct., 1895    | 108   | 1           | 767 5 10    | 6,563       | 28 May, 1896     |
|   | 18          | 2,220 7 7   | 4,901       | 10 Mar., 1896    |   |             |             |             |                  |
| Total...  |             | £54,320 7 7 |             |                  |   |             |             |             |                  |

Department of Audit, 18th June, 1896.

RETURN of Payments made to Messrs. Carter, Gummow, & Co., on account of Sewerage Contracts during period 1892 to 1896 inclusive.

| <i>Waverley and Woollahra Branch Intercepting Sewer.</i> |             |               |             |                  | <i>North Shore Main Outfall Sewer from near Long Bay, at Mount-street.</i> |             |               |               |                  |
|--|-------------|---------------|-------------|------------------|--|-------------|---------------|---------------|------------------|
| Cont. No.  | Advance No. | Amount.       | Voucher No. | Date of Payment. | Cont. No.  | Advance No. | Amount.       | Voucher No.   | Date of Payment. |
| 53   | 1           | £ 838 1 2     | 4,756/90    | 11 Nov., 1890    | 79   | 1           | £ 2,460 10 2  | 1,849/92      | 13 April, 1892   |
|  | 2           | 1,422 10 4    | 5,257/90    | 17 Dec., 1890    |  | 2           | 3,010 8 3     | 2,597/92      | 19 May, 1892     |
|  | 3           | 751 13 2      | 295/91      | 16 Jan., 1891    |  | 3           | 2,874 19 2    | 3,153/92      | 17 June, 1892    |
|  | 4           | 1,116 4 6     | 792/91      | 12 Feb., 1891    |  | 4           | 2,648 1 5     | 3,801/92      | 18 July, 1892    |
|  | 5           | 859 5 6       | 1,508/91    | 13 Mar., 1891    |  | 5           | 1,537 10 4    | 4,705/92      | 24 Aug., 1892    |
|  | 6           | 594 18 0      | 2,093/91    | 10 April, 1891   |  | 6           | 1,310 10 8    | 5,692/92      | 14 Oct., 1892    |
|  | 7           | 228 5 3       | 3,009/91    | 20 May, 1891     |  | 7           | 1,188 18 0    | 6,219/92      | 15 Nov., 1892    |
|  | 8           | 479 9 6       | 3,412/91    | 9 June, 1891     |  | 8           | 898 13 0      | 6,814/92      | 19 Dec., 1892    |
|  | 9           | 508 9 6       | 4,291/91    | 17 July, 1891    |  | 9           | 752 1 9       | 281/93        | 19 Jan., 1893    |
|  | 10          | 608 12 6      | 4,882/91    | 15 Aug., 1891    |  | 10          | 1,043 0 2     | 733/93        | 17 Feb., 1893    |
|  | 11          | 416 17 9      | 5,450/91    | 11 Sept., 1891   |  | 11          | 914 1 8       | 1,278/93      | 18 Mar., 1893    |
|  | 12          | 758 0 0       | 6,051/91    | 10 Oct., 1891    |  | 12          | 757 12 5      | 1,664/93      | 17 April, 1893   |
|  | 13          | 827 13 5      | 6,628/91    | 6 Nov., 1891     |  | 13          | 1,453 9 0     | 1,834/93      | 28 ,, 1893       |
|  | 14          | 808 19 0      | 7,376/91    | 15 Dec., 1891    |  | 14          | 835 14 0      | 2,386/93      | 5 June, 1893     |
|  | 15          | 545 19 8      | 205/92      | 13 Jan., 1892    |  | 15          | 1,480 4 6     | 3,004/93      | 7 July, 1893     |
|  | 16          | 1,572 19 6    | 1,157/92    | 8 Mar., 1892     |  | 16          | 1,739 4 5     | 3,571/93      | 7 Aug., 1893     |
|  | 17          | 1,074 6 1     | 1,766/92    | 8 April, 1892    |  | 17          | 2,452 1 8     | 4,103/93      | 6 Sept., 1893    |
|  | 18          | 665 15 6      | 2,359/92    | 10 May, 1892     |  | 18          | 1,883 11 5    | 4,591/93      | 5 Oct., 1893     |
|  | 19          | 600 0 0       | 2,705/92    | 25 ,, 1892       |  | 19          | 1,227 5 0     | 5,306/93      | 14 Nov., 1893    |
|  | 20          | 578 17 2      | 3,150/92    | 17 June, 1892    |  | 20          | 1,774 17 6    | 5,705/93      | 7 Dec., 1893     |
|  | 21          | 818 4 3       | 5,268/92    | 22 Sept., 1892   |  | 21          | 2,880 11 6    | 117/94        | 10 Jan., 1894    |
|  | 22          | 300 0 0       | 6,195/92    | 14 Nov., 1892    |  | 22          | 1,832 7 9     | 351/94        | 2 Feb., 1894     |
|  | 23          | 975 11 8      | 419/93      | 30 Jan., 1893    |  | 23          | 1,794 18 0    | 884/94        | 7 Nov., 1894     |
|  | Final 24    | 958 1 3       | 1,452/93    | 30 Mar., 1893    |  | 24          | 741 8 0       | 2,017/94      | 18 May, 1894     |
| Total...   |             | £18,308 14 8  |             |                  | Final...   | 531 10 6    | 5,248/94      | 18 Dec., 1894 |                  |
| <i>Stormwater Sewer, Munni-street, at Shea's Creek.</i>  |             |               |             |                  | <i>Sydney Sewerage.</i>  |             |               |               |                  |
| 72   | 1           | £ 1,213 19 4  | 2,440/91    | 24 April, 1891   | 79A  | 1           | £ 1,337 19 10 | 2,793/94      | 3 July, 1894     |
|  | 2           | 2,854 2 0     | 3,819/91    | 4 June, 1891     |  | 2           | 1,135 18 0    | 3,189/94      | 31 ,, 1894       |
|  | 3           | 641 12 8      | 4,099/91    | 9 July, 1891     |  | 3           | 658 2 8       | 3,651/94      | 30 Aug., 1894    |
|  | 4           | 2,095 0 5     | 4,567/91    | 31 ,, 1891       |  | 4           | 549 15 0      | 4,155/94      | 29 Sept., 1894   |
|  | 5           | 2,462 13 10   | 5,292/91    | 4 Sept., 1891    |  | 5           | 356 10 1      | 4,630/94      | 2 Nov., 1894     |
|  | 6           | 2,650 19 0    | 5,951/91    | 8 Oct., 1891     |  | 6           | 674 0 11      | 4,981/94      | 28 ,, 1894       |
|  | 7           | 3,257 18 3    | 6,595/91    | 6 Nov., 1891     |  | 7           | 1,400 12 4    | 89/95         | 9 Jan., 1895     |
|  | 8           | 905 1 3       | 7,473/91    | 21 Dec., 1891    |  | 8           | 270 8 11      | 434/95        | 29 ,, 1895       |
|  | 9           | 1,293 11 1    | 1,094/92    | 4 Mar., 1892     |  | 9           | 322 3 2       | 980/95        | 28 Feb., 1895    |
|  | 10          | 2,155 17 2    | 2,890/92    | 3 June, 1892     |  | 10          | 349 1 3       | 1,579/95      | 1 April, 1895    |
|  | 11          | 500 0 0       | 3,369/92    | 27 ,, 1892       |  | 11          | 746 15 5      | 2,149/95      | 8 May, 1895      |
|  | 12          | 1,842 7 5     | 3,526/92    | 5 July, 1892     |  | 12          | 717 9 8       | 2,587/95      | 3 June, 1895     |
|  | 13          | 1,258 12 8    | 4,083/92    | 29 ,, 1892       |  | 13          | 507 15 9      | 16/95-6       | 2 July, 1895     |
|  | 14          | 528 3 10      | 4,870/92    | 2 Sept., 1892    |  | 14          | 618 18 0      | 580/95-6      | 2 Aug., 1895     |
|  | 15          | 628 2 5       | 6,232/92    | 15 Nov., 1892    |  | 15          | 2,000 0 0     | 820/95-6      | 15 ,, 1895       |
|  | 16          | 100 0 0       | 6,490/92    | 30 ,, 1892       |  | 16          | 194 15 2      | 1,339/95-6    | 13 Sept., 1895   |
|  | Final 17    | 816 17 7      | 68/93       | 6 Jan., 1893     |  | 17          | 694 13 0      | 1,678/95-6    | 3 Oct., 1895     |
| Total...   |             | £25,264 18 11 |             |                  | 18   | 247 7 0     | 2,169/95-6    | 30 ,, 1895    |                  |
|  |             |               |             |                  | 19   | 192 9 0     | 2,967/95-6    | 4 Dec., 1895  |                  |
|  |             |               |             |                  | 20   | 240 3 9     | 3,897/95-6    | 15 Jan., 1896 |                  |
|  |             |               |             |                  | 21   | 1,050 6 7   | 6,226/95-6    | 12 May, 1896  |                  |

## RETURN of payments made to Messrs. Carter &amp; Co. on account of Sewerage Contract No. 65.

| Nature of contract        | Advance No. | Amount.    | Voucher No. | Date of Payment. | Nature of contract        | Advance No. | Amount.      | Voucher No. | Date of Payment. |  |
|---------------------------|-------------|------------|-------------|------------------|---------------------------|-------------|--------------|-------------|------------------|--|
| Western Suburbs Sewerage. | 1           | £ 406 0 11 | 5,255/90    | 17 Dec., 1890    | Western Suburbs Sewerage. | 10          | £ 2,934 1 0  | 6,047       | 10 Oct., 1891    |  |
|                           | 2           | 628 11 11  | 934/91      | 19 Feb., 1891    |                           | 11          | 2,848 1 1    | 6,794       | 17 Nov., 1891    |  |
|                           | 3           | 648 6 8    | 1,559       | 16 Mar., 1891    |                           | 12          | 1,000 0 0    | 7,156       | 4 Dec., 1891     |  |
|                           | 4           | 824 18 6   | 2,229       | 16 April, 1891   |                           | 13          | 1,545 15 0   | 7,369       | 15 „ 1891        |  |
|                           | 5           | 1,086 14 7 | 2,839       | 13 May, 1891     |                           | 14          | 1,668 13 11  | 404/92      | 22 Jan., 1892    |  |
|                           | 6           | 1,045 5 2  | 3,524       | 12 June, 1891    |                           | 15          | 1,208 6 1    | 823         | 19 Feb., 1892    |  |
|                           | 7           | 940 14 11  | 4,289       | 17 July, 1891    |                           | Final       | 1,681 15 7   | 3,202       | 20 June, 1892    |  |
|                           | 8           | 2,712 8 6  | 4,894       | 17 Aug., 1891    |                           | Total ..... | £ 24,298 9 3 |             |                  |  |
|                           | 9           | 3,118 15 5 | 5,441       | 11 Sept., 1891   |                           |             |              |             |                  |  |

Department of Audit.—A.F., 26/6/96.

£5. Sandstone ballast, W.S. and S. Board.—T.F., 21/2/93. V. 3,266/93.

## Appendix No. 24.

Know all Men by the Presents,—That I, George Forrest, of Marrickville, in the Colony of New South Wales, householder, am held and firmly bound unto Her Most Gracious Majesty, Queen Victoria, in the penal sum of £6,000 sterling, to be paid in Sydney, in the said Colony, to Her said Majesty, her heirs or successors, for which payment well and truly to be made, I bind myself, my and each and every of my heirs, executors, and administrators firmly by these presents.

Sealed with my seal, dated the 16th day of May, in the year of our Lord, 1895.

WHEREAS by agreement, bearing even date herewith, and expressed to be made between John Carter, Frank Moorehouse Gummow, and David Graham Snodgrass, carrying on business together as contractors, under the name, style, or firm of “Carter, Gummow, and Company,” and therein and hereinafter called the contractors, of the one part, and Her said Majesty of the other part, the said contractors covenanted to perform the various works required in and about the full and proper construction, erection, and completion of the northern main sewer, Leichhardt and Annandale sections, Contract No. 77, Sydney Sewerage, according to the copy notice, specification, schedule to specification, general conditions, special condition, supplementary specification, tender, copy letter of acceptance of tender, and letter of assent thereto, thereunto annexed, and marked “A,” “B,” “C,” “D,” “E,” “F,” “G,” “H,” and “I,” respectively, and certain drawings relating thereto, now in the office of the Engineer-in-Chief for Metropolitan Sewerage Construction, and marked “No. 1” to “No. 11,” both inclusive.

And whereas the contractors have entered into a bond to Her said Majesty, dated the 16th day of May, 1895, conditioned to remove at their own cost so much of the said works as shall have been constructed on the “Monier System” if the Engineer shall be dissatisfied with the same at any time during either of the periods of maintenance set out in the said General Conditions and Supplementary Specification respectively, and for the re-erection and construction of the said works, and to provide for the free and uninterrupted flow of sewage during the progress of such rebuilding, at their own expense, in accordance in all things with the said specification, schedule to specification, general conditions, special condition, and plans therein respectively referred to, and within thirty-nine weeks from the date of being called upon to do so. And whereas I, the said George Forrest, have offered to become bound to Her said Majesty, her heirs and successors, for the due performance and fulfilment of the said contract, according to the said agreement, and the several annexures thereto, so far as the removal of a portion of the said works constructed on the “Monier System” is concerned, if the Engineer shall be dissatisfied with the same at any time during either of the periods of maintenance referred to, and the re-erection of the said works, and for the free and uninterrupted flow of sewage during the progress of such rebuilding, at the contractor's expense, in the manner provided for in the original specification, schedule to specification, general conditions, and plans within the time lastly hereinbefore set out. Now the condition of the above-written bond and obligation is such that if the contractors do and shall well and truly remove so much of the said works as shall have been constructed on the “Monier System,” if the Engineer shall be dissatisfied with the same at any time during the respective periods of maintenance set out in the said general conditions and supplementary specification, and re-erect and construct the said works, and provide for the free and uninterrupted flow of sewage during the progress of such rebuilding at their own expense, in accordance in all things with the said specification, schedule to specification, general conditions, and special condition, and the plans therein respectively referred to within thirty-nine weeks from the date of being called upon to do so. Then this obligation will be void, and of none effect, otherwise to remain in full force and virtue.

Sworn, sealed, and delivered by the abovenamed }  
George Forrest, in the presence of,—

GEO. FORREST.

HAROLD F. NORRIE.

## STATUTORY DECLARATION.

I, GEORGE FORREST, of Marrickville, in the Colony of New South Wales, householder, do hereby solemnly declare and affirm that I am possessed of property to the value of £6,000 sterling and more, and that such property consists of—Freehold property, £5,700; cash in bank, £300 sterling. And I make this solemn declaration as to the matters aforesaid, according to the law in this behalf made and subject to the punishment by law provided for any wilfully false statement in any such declaration.

Taken and declared at Marrickville, this 1st day }  
of June, 1895, before me,—

GEO. FORREST.

ROBERT ANDERSON, J.P.

Know all Men by these Presents,—That I, James Gillan, of Dulwich Hill, in the Colony of New South Wales, householder, am held and firmly bound unto Her Most Gracious Majesty Queen Victoria, in the penal sum of £6,000 sterling, to be paid in Sydney, in the said Colony, to Her said Majesty, her heirs or successors, for which payment well and truly to be made I bind myself, my and each and every of my heirs, executors and administrators firmly by these presents.

Sealed with my seal, dated the 16th day of May, in the year of our Lord, 1895.

WHEREAS, by agreement bearing even date herewith, and expressed to be made between John Carter, Frank Moorhouse Gummow, and David Graham Snodgrass, carrying on business together as contractors, under the name, style, or form of “Carter, Gummow, & Co.” and therein and hereinafter called the contractors of the one part, and Her said Majesty of the other part, the said contractors covenanted to perform the various works required in and about the full and proper construction, erection, and completion of the northern main sewer, Leichhardt and Annandale sections, Contract No. 77, Sydney sewerage, according to the copy notice, specification, schedule to specification, general conditions, special condition, supplementary specification, tender, copy, letter of acceptance of tender, and letter of assent thereto, thereunto annexed and marked “A,” “B,” “C,” “D,” “E,” “F,” “G,” “H,” and “I” respectively, and certain drawings relating thereto, now in the office of the Engineer-in-Chief for Metropolitan Sewerage Construction, and marked No. 1 to No. 11,” both inclusive.

And whereas the contractors have entered into a bond to Her said Majesty, dated the 16th day of May, 1895, conditioned to remove at their own cost so much of the said works as shall have been constructed on the “Monier System” if the Engineer shall be dissatisfied with the same at any time during either of the periods of maintenance set out in the said general conditions and supplementary specifications respectively, and for the re-erection and construction of the said works, and for the free and uninterrupted flow of sewage during the progress of such rebuilding, at their own expense, in accordance in all things with the said specification, schedule to specification, general conditions, special conditions and plans

plans therein respectively referred to, and within thirty-nine weeks from the date of being called upon to do so. And whereas I, the said James Gillan, have offered to become bound to Her said Majesty, her heirs and successors for the due performance and fulfilment of the said contract, according to the said agreement and the several annexures thereto, so far as the removal of the portion of the said works constructed on the "Monier System" is concerned, if the Engineer shall be dissatisfied with the same, at any time during the periods of maintenance referred to and the re-erection of the said works, and for the free and uninterrupted flow of sewage during the progress of such rebuilding at the contractor's expense, in the manner provided for in the original specification, schedule to specification, general conditions, and plans within the time lastly hereinbefore set out. Now the condition of the above-written bond and obligation is such that if the contractors do and shall well and truly remove so much of the said works as shall have been constructed on the "Monier System," if the Engineer shall be dissatisfied with the same, at any time during either of the respective periods of maintenance set out in the said general conditions and supplementary specification, and re-erect and construct the said works, and provide for the free and uninterrupted flow of sewage during the progress of such rebuilding at their own expense, in accordance in all things with the said specification, schedule to specification, general conditions, and special condition, and the plans therein respectively referred to within thirty-nine weeks from the date of being called upon to do so. Then this obligation will be void and of none effect, otherwise to remain in full force and virtue.

Signed, sealed, and delivered by the abovenamed }  
James Gillan, in the presence of, — HAROLD F. NORRIE.

JAMES GILLAN.

## STATUTORY DECLARATION.

I, JAMES GILLAN, of Dulwich Hill, in the Colony of New South Wales, householder, do hereby solemnly declare and affirm that I am possessed of property to the value of £6,000 sterling and more, and that such property consists of cash at bankers, freehold, and other property. And I make this solemn declaration as to the matters aforesaid according to the law in this behalf made, and subject to the punishment by law provided for any wilfully false statement in any such declaration.

Taken and declared at Sydney, this 27th day }  
of May, 1895, before me, — HAROLD F. NORRIE, J.P.

JAMES GILLAN.

## Appendix No. 25.

LIST of Contracts entered into by Messrs. Snodgrass and Gillan, Rochester and Gummow, Gummow, Bennett, and Canty, Gummow & Co., Forrest and Snodgrass, Gummow and Gillan, Carter & Co., and Carter, Gummow, & Co., with the Government of New South Wales, between November, 1886, and May, 1896.

| No. of Contract. | Style or Firm.              | Names of Persons comprising Firm.  | Date of Signing Contract. |
|------------------|-----------------------------|--|---------------------------|
| 22               | Snodgrass and Gillan.....   | David Graham Snodgrass and James Gillan .....  | 2 Nov., 1886              |
| 21               | Rochester and Gummow .....  | Joseph John Rochester and Frank Moorhouse Gummow* .....  | 23 ,, 1886                |
| 30               | Gummow, Bennett, and Canty  | Frank Moorhouse Gummow, Edward Bennett, and Michael Canty.   | 30 June, 1887             |
| 68               | Gummow & Co. ....           | Frank Moorehouse Gummow, James Gillan, George Featherstone Maddison, and Peter Ewing.              | 27 July, 1888             |
| S. W. S.         | Forrest and Snodgrass ..... | George Forrest and David Graham Snodgrass.....   | 16 Nov., 1888             |
| 38               | Gummow & Co.....            | Frank Moorhouse Gummow, James Gillan, George Maddison, and Edward Bennett.                         | 26 ,, 1888                |
| 32               | Forrest and Snodgrass ..... | George Forrest and David Graham Snodgrass.....   | 5 July, 1889              |
| 45               | Carter & Co. .. ..          | John Carter, Charles Richards,† and David Graham Snodgrass   | 16 April, 1890            |
| 56               | Do .....                    | John Carter and George Forrest.....  | 23 June, 1890             |
| 60               | Do .....                    | do do .....  | 23 ,, 1890                |
| 61               | Do .....                    | John Carter and David Graham Snodgrass .....   | 25 Aug., 1890             |
| 53               | Do .....                    | Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing.                            | 13 Sept., 1890            |
| 63               | Do do .....                 | do do do do .....  | 19 Dec., 1890             |
| 66               | Carter & Co. ....           | John Carter, David Graham Snodgrass, and George Forrest ...  | 12 Feb., 1891             |
| 65               | Do .....                    | do do do .....   | 16 Mar., 1891             |
| 72               | Gummow and Gillan .....     | Frank Moorhouse Gummow, James Gillan, and Peter Ewing...   | 6 April, 1891             |
| 74               | Carter & Co. ....           | John Carter and David Graham Snodgrass .....   | 10 Mar., 1892             |
| 79               | Gummow and Gillan.....      | Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing .....                       | 21 Mar., 1892             |
| 78               | Carter, Gummow, & Co. ....  | John Carter, David Graham Snodgrass, George Maddison, Peter Ewing, and Frank Moorhouse Gummow..... | 22 Jan., 1894             |
| 69               | Carter & Co. ....           | John Carter and David Graham Snodgrass .....   | 20 June, 1894             |
| 79a              | Carter, Gummow, & Co. ....  | John Carter, Frank Moorhouse Gummow, and David Graham Snodgrass .....                              | 16 May, 1895              |
| 77               | Do do .....                 | do do do .....   | 15 June, 1895             |
| 118              | Do do .....                 | John Carter, Frank Moorhouse Gummow, and George Forrest  | 19 May, 1896              |
| 108              | Do do .....                 | do do do .....   |                           |

HAROLD F. NORRIE,  
Clerk-in-charge of Bonds and Contracts.

\* Mr. Gummow assigned his interest to Mr. Rochester.  
† Mr. Richards assigned his interest to Messrs. Carter and Snodgrass.

## Appendix No. 26.

Sureties—Contract 77.

Mr. Darley for report.—J.B., 5/4/95. I concur with Mr. Hickson. I think in accepting a new patent of this kind, and adopting it on a large and costly contract, that the Department cannot be too careful in securing its position by leaving all the risk on the hands of the contractors and patentees. I therefore recommend that the personal names be required for further surety. The names mentioned may, I think, be accepted.—C.D., Engineer-in-Chief, Metropolitan Sewerage Construction, 8/4/95.

For Minister's approval as to course suggested in regard to sureties.—J. BARLING, Under Secretary for Public Works, 9/4/95. Approved.—J.H.Y., 10/4/95. Mr. Norrie.—JNO. P., 10/4/95.



## Appendix No. 27.

List of Sewerage Contracts in which Sureties have been accepted.

| No. of Contract. | Contractor.   | Sureties.   | Penal Sum. | Date when Contract was signed. |
|------------------|---|---|------------|--------------------------------|
| 94               | Wm. Walker Johnson, of Walla-end.   | George Fishburn, of Summer Hill, railway contractor; Samuel Palmer, of Randwick, freeholder.                | £ 800      | 7 Nov., 1893.                  |
| 89               | Thomas Steele Phillips, Benjamin Rhodes, jun., of Waverley.   | Robert Le Neve Scrutton, of Sydney, iron merchant; John Henry Richard King, of Glebe, civil engineer.       | 800        | 16 „ 1893.                     |
| 91               | William O'Neill, Daniel O'Neill, James Rodgers, of Waverley.  | James Pellow Webb, of Redfern, contractor; William Hanley, of Paddington, property owner.                   | 1,300      | 17 „ 1893.                     |
| 83               | William O'Neill, Daniel O'Neill, James Rodgers, of Waverley.  | James Pellow Webb, of Redfern, contractor; Edward Punch, of Waverley, hotelkeeper.                          | 2,500      | 17 „ 1893.                     |
| 97               | William Gilliver, Charles Henry Curtis, of Bankstown.   | Robert George Watkins, of Sydney, machinery merchant; Henry Lucien Gilliver, of Jerilderie, contractor.     | 675        | 8 Jan., 1894.                  |
| 92               | Robert Butcher, Samuel Butcher, of North Sydney.  | Henry Hart and Edward Gallagher, of Petersham, pottery proprietors.   | 550        | 17 „ 1894.                     |
| 101              | John Ahearn, of Burwood.....  | Henry Hudson, of Darling Point, contractor; Hugh McArdle, of Sydney, contractor.                            | 3,050      | 19 „ 1894.                     |
| 69               | John Carter, David Graham Snodgrass, George Maddison, Peter Ewing, Frank Moorhouse Gummow, of North Sydney. | Charles James Henty and Robert Le Neve Scrutton, of Sydney, merchants.                                      | 4,520      | 22 „ 1894.                     |
| 98               | Andrew Eaton, George Eaton, of North Sydney.  | John Wood Eaton, of North Sydney, timber merchant; John Andrew Ellis Eaton, of Redfern, contractor.         | 1,000      | 14 May, 1894.                  |
| 100              | Thomas Johnston, Patrick O'Rourke, Patrick Gordon, of North Sydney.   | George Anderson and James Power, of North Sydney, contractors.  | 700        | 16 July, 1894.                 |
| 77               | John Carter, Frank M. Gummow, David Graham Snodgrass.   | George Forrest, of Marrickville, householder (£6,000); James Gillan, of Dulwich Hill, householder (£6,000). | 12,000     | 16 May, 1895.                  |

HAROLD F. NORRIE,  
Clerk in Charge of Bonds and Contracts.

## Appendix No. 28.

The Engineer-in-Chief for Sewerage to The Under Secretary for Public Works.

*Minute Paper.*

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 5 April, 1895.

THE accompanying letter of 4th April, 1895, from Messrs. Carter, Gummow, & Co., is a protest against the stringent supplementary specification prepared by Mr. Norrie, at my suggestion, with regard to the alteration in the design of Contract No. 77.

The last paragraph of this specification states:—"And the contractors shall enter into a bond with Her Majesty the Queen in the penal sum of £12,000, with two sufficient sureties in the penal sum of £6,000 each, to secure the removal of so much of the said works as shall have been constructed on the Monier system, &c., &c."

The amount of £12,000 is the sum it would cost the Department, at departmental rates, to renew that portion of this sewer which is built on the Monier system.

It is right, however, to say that the tendered rates for this portion of the work would only come to £9,000; but, prices being abnormally low, I think it is only right to put in a sum at which the Department really values the work.

Messrs. Carter and Gummow ask that their own "personal sureties for the amount named," i.e., £12,000 (an amount which they do not dispute), "should be taken for its completion and maintenance, and as a sufficient guarantee for the proper carrying out of the work."

They go on to say that they are "a firm of sound financial standing, well\*and favourably known to the Department as contractors." This is quite true; they are a firm in which I have every confidence. They have done a great deal of work under me, and I can testify that their aim always has been to turn out the very best class of work possible. At the same time, misfortunes happen the very soundest firms of contractors, and the Department must look a little way into the future. Their own bond for £12,000 would be really of no use if they were unfortunate enough in the meantime to become bankrupt.

I think, therefore, it is right that the sureties should be insisted upon. They give the names of two men, Mr. George Forrest and Mr. James Gillan. From inquiries made, I believe these men to be financially sound; and, I think, if their names were accepted as the sureties in the penal sum of £6,000 each the Department would be secured as far as it is reasonably possible to be.

This work will be carried out under Mr. Darley, and I recommend that the whole of the papers be sent him to give his opinion thereon.

ROBT. HICKSON,  
Engineer-in-Chief for Public Works.

## Appendix No. 29.

MR. GEORGE FORRESTS' PRIVATE ACCOUNT.

RETURN showing his receipt of salary as member of the firm of Messrs. Carter, Gummow, &amp; Co., from 1894 to 1896.

| 1894. |          | £  | s. | d. | 1895. |           | £  | s. | d. |
|-------|----------|----|----|----|-------|-----------|----|----|----|
| 16    | October  | 43 | 6  | 8  | 2     | September | 43 | 6  | 8  |
| 30    | "        | 43 | 6  | 8  | 23    | October   | 43 | 6  | 8  |
| 1895. |          |    |    |    | 12    | November  | 43 | 6  | 8  |
| 2     | January  | 43 | 6  | 8  | 13    | December  | 43 | 6  | 8  |
| 12    | February | 43 | 6  | 8  | 1896. |           |    |    |    |
| 28    | "        | 43 | 6  | 8  | 16    | January   | 43 | 6  | 8  |
| 3     | April    | 43 | 6  | 8  | 3     | February  | 43 | 6  | 8  |
| 3     | May      | 43 | 6  | 8  | 13    | March     | 43 | 6  | 8  |
| 6     | June     | 43 | 6  | 8  | 30    | "         | 43 | 6  | 8  |
| 6     | July     | 43 | 6  | 8  | 4     | May       | 43 | 6  | 8  |
| 30    | "        | 43 | 6  | 8  | 1     | June      | 43 | 6  | 8  |

### Appendix No. 30.

SECURITIES lodged with the Bank of New Zealand for the Account of Carter & Co.

Received, 23rd May, 1890 ; given up, 2nd July, 1891.

Conveyance No. 1,000, Bk 156, T. Ellen to E Carter, of land at St. Leonards, 30 feet to Hill-street West and 71 feet to Elizabeth-street, and sundry deeds in support of title.

Equitable deposit of above deeds, John Carter (Administra'tor of E. Carter) to Bank.

Received 20th April, 1892.

Letter from Treasury stating that they hold order from Carter & Co to lodge all moneys with us

Received, 11th March, 1895 ; given up, 10th April, 1895.

Equitable deposit of certificates of title, vol. 1,072, fols 73 and 75.

T. E. CORKILL,  
Assist. Accountant

|   |   |  |  |
|---|---|--|--|
| Dr.   | JAMES GILLAN, Esq, in account with the Bank of New Zealand, Sydney. |  | Cr.  |
| 1895.<br>April 4 .. To <i>Daily Telegraph</i> .. . . . . . . . . . . .<br>May 22   Cash .. .<br>June 12 <i>Town and Country</i> Company .. . . . . . . . . . .<br>„ 30     Balance .. .<br>_____<br>£85 3 6 | £ s d.<br>1 0 0<br>30 0 0<br>1 5 0<br>52 18 6<br>_____<br>£85 3 6   | 1895.<br>March 31 ... By Balance .. . . . . . . . . . . . . . .<br>April 8 ...   Cash .. .<br>June 13     " .. .<br>_____<br>£85 3 6 | £ s d.<br>74 3 6<br>5 10 0<br>5 10 0<br>_____<br>£85 3 6 |
|   |   | June 30 .. By Balance .. . . . . . . . . . . . . . . . . .   | £52 18 6   |

Bank of New Zealand, Sydney, 30th June, 1896. T. E. CORKILL, Assist. Accountant.

|   |   |   |  |
|---|---|---|--|
| Dr.   | GEORGE FORREST, Esq, in account with the Bank of New Zealand, Sydney. |   | Cr.  |
| 1895.<br>May 1 ... To Forrest .. .<br>„ 21 ...   " .. .<br>June 30   Balance .. .<br>_____<br>£383 10 0 | £ s d.<br>10 0 0<br>20 0 0<br>353 10 0<br>_____<br>£383 10 0          | 1895.<br>March 31 ... By Balance .. .<br>April 3 ...   Cheque .. .<br>May 3     " .. .<br>June 6     " .. .<br>_____<br>£383 10 0 | £ s d.<br>253 10 0<br>43 6 8<br>43 6 8<br>43 6 8<br>_____<br>£383 10 0 |
|   |   | June 30 ... By Balance ..   | £353 10 0  |

Bank of New Zealand, Sydney, 30th June, 1896. T. E. CORKILL, Assist. Accountant.

### Appendix No. 31.

SALES and deliveries of Cement—Paibury, Henty, & Co. to Messrs. Carter & Co. and Carter, Gummow, & Co., from 1st January, 1892, to 30th June, 1896.

| Date          | No in copy of Led Account | Ex Ship          | Brand      | Delivered | Returned | Place of Delivery                                    | Statement of Delivery                |                             |   |                      |        |
|---------------|---------------------------|------------------|------------|-----------|----------|--|--------------------------------------|-----------------------------|---|----------------------|--------|
|               |                           |                  |            |           |          |  | North Shore Contracts Nos 79 and 79A | Marrickville Contract No 69 | Aprahake and Leachburd Contracts Nos 77 and 116 | Waverley con- tracts | Sundry |
| 1892.         |                           |                  |            | Casks.    | Casks.   |  | Casks.                               | Casks.                      | Casks.  | Casks.               |        |
| 18 May        | 1                         | Strathdon        | Wouldham   | 100       |          | Waverley ..  |                                      |                             | 100   |                      |        |
| 28 July       | 2                         | Wavertree        | "          | 150       |          | "  |                                      |                             | 150   |                      |        |
| 21 Sept.      | 3                         | Brilliant        | "          | 50        |          | North Shore .  | 50                                   |                             |   |                      |        |
| 24 "          | 4                         | Indrapura        | "          | 699       |          | "  | 699                                  |                             |   |                      |        |
| 21 "          | 5                         | Illawarra        | "          | 250       |          | "  | 250                                  |                             |   |                      |        |
| 24 Oct.       | 8                         | Bungaree         | "          | 925       | 925      | "  |                                      |                             |   |                      |        |
| 1893.         |                           |                  |            |           |          |  |                                      |                             |   |                      |        |
| 30 June 1894. | 11                        | Leyland Bros.    | "          | 500       |          | North Shore  | 500                                  |                             |   |                      |        |
| 24 Jan.       | 14                        | "                | "          | 562       |          | Marrickville . .                                     |                                      | 562                         |   |                      |        |
| 24 "          | "                         | Pericles         | "          | 273       |          | "  |                                      | 273                         |   |                      |        |
| 24 "          | 14                        | Cromdale         | "          | 174       |          | "  |                                      | 174                         |   |                      |        |
| 21 "          | 16                        | Cressington      | "          | 400       |          | "  |                                      | 400                         |   |                      |        |
| 14 April      | 18                        | Indramayo        | "          | 180       |          | "  |                                      | 180                         |   |                      |        |
| 2 May         | 20                        | "                | "          | 160       |          | "  |                                      | 160                         |   |                      |        |
| 11 "          | 22                        | Warrigal .       | "          | 199       |          | North Shore, 24 ; Marrickville, 151 ; Drummoyne, 24. | 24                                   | 151                         |   | 24                   |        |
| 21 "          | 25                        | Innamneka        | Gillingham | 117       | 116      | Marrickville   |                                      |                             |   |                      |        |
| 9 June        | 28                        | Star of England. | Wouldham   | 24        |          | "  |                                      | 24                          |   |                      |        |
| 1 "           | 29                        | "                | "          | 12        |          | "  |                                      | 12                          |   |                      |        |
| 1 "           | 29                        | "                | "          | 4         |          | "  |                                      | 4                           |   |                      |        |
| 14 "          | 32                        | Dartford         | "          | 172       |          | "  |                                      | 172                         |   |                      |        |
|               | 32                        | 15               | "          | 128       |          | "  |                                      | 128                         |   |                      |        |
| 16 "          | 34                        | Miltiades        | "          | 200       |          | "  |                                      | 200                         |   |                      |        |
|               | 33                        | Ex Store         | Germania . | 6         |          | (Not traced)   |                                      |                             |   | 6                    |        |
|               | 37                        | Gulf of Taranto. | Wouldham   | 238       |          | Marrickville   |                                      | 238                         |   |                      |        |
| 20 "          | 38                        | Star of England. | "          | 150       |          | "  |                                      | 150                         |   |                      |        |
|               | 38                        | "                | "          | 4         |          | (Not traced)   |                                      |                             |   | 4                    |        |

| Date.  | No. in copy of Led Account | Ex. Ship         | Brand.       | Delivered | Returned | Place of Delivery.                                  | Statement of Delivery                   |                                |  |                    |        |
|--|----------------------------|------------------|--------------|-----------|----------|---|---|--------------------------------|--|--------------------|--------|
|  |                            |                  |              |           |          |   | North Shore - Contracts Nos. 79 and 79A | Marrickville - Contract No. 69 | Annandale and Waverley - Contracts Nos. 77 and 118 | Waverley contracts | Sundry |
| 1894.  |                            |                  |              | Casks     | Casks.   |   | Casks.                                  | Casks.                         | Casks.   | Casks              |        |
| 18 June  | 41                         | Culgoa .....     | Wouldham     | 750       | ..       | Marrickville .....                                  | 750                                     |                                |  |                    |        |
| 30 "   | 42                         | Australasian..   | "            | 977       | ..       | North Shore .....                                   | 977                                     |                                |  |                    |        |
| 6 Aug.   | 43                         | Patriarch .. ..  | "            | 358       | ..       | Marrickville ..                                     | 358                                     |                                |  |                    |        |
| 20 Sept.   | 45                         | Cairnbulg .....  | "            | 1,500     | ..       | North Shore (Grant's wharf).                        | 1,500                                   |                                |  |                    |        |
| 15 "   | 47                         | Neotsfield .. .. | Gostling..   | 2,528     | 654      | Marrickville ....                                   | 1,874                                   |                                |  |                    |        |
| 6 Nov.   | 49                         | Cairnbulg .. ..  | Wouldham     | 50        | ..       | Marrickville (from store, 134 delivered to Molloy). | 50                                      |                                |  |                    |        |
| 1895.  |                            |                  |              |           |          |   |   |                                |  |                    |        |
| 10 Jan.  | 50                         | "                | "            | 200       | ..       | Marrickville ..                                     | 200                                     |                                |  |                    |        |
| 15 Mar.  | 53                         | Macquarie .. ..  | "            | 250       | ..       | "   | 250                                     |                                |  |                    |        |
| 19 June  | 55                         | Afghanistan ..   | Hemmoor..    | 100       | ..       | "   | 100                                     |                                |  |                    |        |
| 8 July   | 57                         | "                | "            | 100       | ..       | "   | 100                                     |                                |  |                    |        |
| 17 "   | 59                         | "                | "            | 750       | ..       | "   | 750                                     |                                |  |                    |        |
| 27 "   | 60                         | "                | "            | 250       | ..       | "   | 250                                     |                                |  |                    |        |
| 6 Aug.   | 61                         | "                | "            | 50        | ..       | "   | 50                                      |                                |  |                    |        |
| 10 "   | 63                         | "                | "            | 100       | ..       | North Shore, Chester, lighter, 28/3/93.             | 100                                     |                                |  |                    |        |
| 10 Sept.   | 64                         | Sommerfeld ...   | Condor ..... | 1,000     | ..       | North Shore, 200; Annandale, 800.                   | 200                                     | 800                            |  |                    |        |
| 16 "   | 65                         | Ross shire ..... | Hemmoor      | 1,000     | ..       | Annandale, lighter .....                            |   | 1,000                          |  |                    |        |
| 16 "   | 65                         | "                | Germania     | 2,000     | ..       | "   |   | 2,000                          |  |                    |        |
| 16 Oct.  | 66                         | "                | Hemmoor.     | 9         | ..       | "   |   | 9                              |  |                    |        |
| 14 Nov.  | 67                         | Lady Palmerston  | Josson ..    | 1,000     | ..       | Annandale .....                                     |   | 1,000                          |  |                    |        |
| 28 Dec.  | 69                         | Coromandel ...   | "            | 1,124     | ..       | "   |   | 1,124                          |  |                    |        |
| 1896.  |                            |                  |              |           |          |   |   |                                |  |                    |        |
| 16 May   | 70                         | Ross-shire .. .. | Hemmoor..    | 100       | ..       | Leichhardt .....                                    |   | 100                            |  |                    |        |
| 20 "   | 71                         | "                | "            | 24        | ..       | "   |   | 24                             |  |                    |        |
| 19 "   | 72                         | "                | "            | 114       | ..       | "   |   | 114                            |  |                    |        |
| 19 "   | 72                         | Achilles .. ..   | "            | 32        | ..       | Rozelle .....                                       |   | 32                             |  |                    |        |
| 19 "   | 73                         | Ross-shire ...   | "            | 24        | ..       | "   |   | 24                             |  |                    |        |
| 8 June   | 74                         | Lord Elgin .     | Germania     | 100       | ..       | Leichhardt .....                                    |   | 100                            |  |                    |        |
| 1 "  | 75                         | "                | "            | 30        | ..       | "   |   | 30                             |  |                    |        |
| 1 "  | 75                         | Ross-shire ..... | Hemmoor..    | 12        | ..       | "   |   | 12                             |  |                    |        |
| 6 "  | 76                         | Lord Elgin .     | Germania .   | 100       | ..       | "   |   | 100                            |  |                    |        |
| 1 "  | 77                         | "                | "            | 50        | ..       | "   |   | 50                             |  |                    |        |
| 15 "   | 78                         | Achilles .. ..   | Hemmoor      | 100       | ..       | Parsons Bros., Sydney .                             |   |                                |  | 100                |        |
| 26 "   | 79                         | "                | "            | 50        | ..       | "   |   |                                |  | 50                 |        |
| Returns not deducted direct from Shipments 1894. |                            |                  |              | 20,509    | 1,695    |   | 4,300                                   | 7,561                          | 6,519  | 250                | 184    |
| 25 July .....                                    |                            |                  |              | 150       |          |   |   |                                |  |                    |        |
| 27 August .....                                  |                            |                  |              | 98        |          |   |   |                                |  |                    |        |
| 7 September .....                                |                            |                  |              | 584       |          |   |   |                                |  |                    |        |
|  |                            |                  |              | 832       | 832      |   |   | 832                            |  |                    |        |
| 12 November .....                                |                            |                  |              | 12        | 12       |   |   |                                |  |                    | 12     |
|  |                            |                  |              | 20,509    | 2,539    |   | 4,300                                   | 6,729                          | 6,519  | 250                | 172    |

| NET SALES.             |               |
|------------------------|---------------|
| Total Deliveries ..... | Casks. 20,509 |
| Less Returns .....     | 2,539         |
|                        | <u>17,970</u> |

| DELIVERIES.            |               |
|------------------------|---------------|
| North Shore .....      | Casks. 4,300  |
| Marrickville .....     | 6,729         |
| Annandale, &c. . . . . | 6,519         |
| Waverley .....         | 250           |
| Sundry .....           | 172           |
|                        | <u>17,970</u> |

SUMMARY of Sundry Purchases of Cement.

| Date.      | Vendor.                  | Ex Ship.          | Deliveries.  |              |              |
|------------|--------------------------|-------------------|--------------|--------------|--------------|
|            |                          |                   | Totals.      | North Shore. | Annandale.   |
| 1893.      |                          |                   | casks.       | casks.       | casks.       |
| 15 July .. | Henry Austn. ....        | Argo .....        | 400          | 400          | ..           |
| 24 "       | Henry Austn .. ..        | M. E. Watson..... | 1,002        | 1,002        | ..           |
| 14 "       | Burns, Philp, & Co. .... | Miltiades .. ..   | 1,000        | 1,000        | ..           |
|            | John Try.....            | "                 | 1,200        | ..           | 1,200        |
|            |                          |                   | <u>3,602</u> | <u>2,402</u> | <u>1,200</u> |

Copy of Ledger Account—Carter & Co. in account with Parbury, Henty, & Company.

|          |  | No. of Invoice. | £ s. d.    |          |                               | £ s. d.      |
|----------|--|-----------------|------------|----------|-------------------------------|--------------|
| 1892.    | To Cement .....                              |                 | 57 10 0    | 1892.    | By Cash .....                 | 60 8 4       |
| 18 May   | " .....                                      |                 | 2 18 4     | 22 June  |                               |              |
| 18 "     |  |                 |            |          |                               |              |
|          |  | 1               | 60 8 4     |          |                               | 60 8 4       |
|          |  |                 |            |          |                               |              |
| 28 Aug.  | Invoice of cement.....                       | 2               | 88 15 0    | 29 Nov.  | Returned cement.....          | 474 1 3      |
| 21 Sept. | " .....                                      | 3               | 28 2 6     | 31 Dec.  | Cash .....                    | 765 10 3     |
| 24 "     | " .....                                      | 4               | 393 3 9    | 1893.    |                               |              |
| 21 "     | " .....                                      | 5               | 140 12 6   | 20 Feb.  | " .....                       | 0 17 6       |
| 25 Oct.  | Cartage account .....                        | 6               | 18 14 7    | 12 April | " .....                       | 31 5 0       |
| 22 "     | Invoice of candles .....                     | 7               | 35 18 9    |          |                               |              |
| 22 "     | " cement.....                                | 8               | 502 19 5   |          |                               |              |
| 29 Nov.  | Allow, as agreed, 1,000<br>casks cement..... | 9               | 31 5 0     |          |                               |              |
| 1893.    |  |                 |            |          |                               |              |
| 20 Feb.  | Invoice candles.....                         | 10              | 31 5 0     |          |                               |              |
| 28 "     | Transfer of account to J.<br>Carter.....     | 10A             | 0 17 6     |          |                               |              |
|          |  |                 |            |          |                               |              |
|          |  |                 | 1,271 14 0 |          |                               | 1,271 14 0   |
|          |  |                 |            |          |                               |              |
| 1893.    | To Invoice of cement.....                    | 11              | 256 5 0    | 1893.    | By Cash .....                 | 290 5 7      |
| 30 June  | " candles .....                              | 12              | 34 0 7     | 17 Aug.  |                               |              |
| 7 July   |  |                 |            |          |                               |              |
| 1894.    |  |                 |            | 1894.    |                               |              |
| 24 Jan.  | " .....                                      | 13              | 34 10 1    | 6 Mar.   | " .....                       | 585 5 0      |
| 24 "     | " cement.....                                | 14              | 517 2 3    | 6 "      | " .....                       | 208 6 8      |
| 24 "     | " cartage .....                              | 15              | 33 12 8    | 22 June  | Cement and cartage.....       | 64 5 8       |
| 31 "     | " cement.....                                | 16              | 208 6 8    | 25 July  | Cement, &c., returned .....   | 83 2 6       |
| 6 April  | " candles .....                              | 17              | 33 17 1    | 15 Aug.  | Cash .....                    | 1,025 0 0    |
| 14 "     | " cement.....                                | 18              | 93 15 0    | 15 "     | " cartage net .....           | 70 17 4      |
| 14 "     | " cartage .....                              | 19              | 6 0 0      | 27 "     | Cement and cartage returned.. | 54 6 2       |
| 2 May    | " cement.....                                | 20              | 83 6 8     | 7 Sept.  | " .....                       | 323 12 8     |
| 2 "      | " cartage .....                              | 21              | 5 6 8      | 31 Oct.  | " .....                       | 55 8 4       |
| 11 "     | " cement.....                                | 22              | 103 12 11  | 7 Nov.   | " .....                       | 16 12 6      |
| 11 "     | " cartage .....                              | 23              | 7 18 8     | 12 "     | " .....                       | 7 18 0       |
| 23 "     | " candles .....                              | 24              | 33 17 1    | 20 "     | " .....                       | 6 13 0       |
| 21 "     | " cement.....                                | 25              | 60 18 9    | 14 Dec.  | Cash .....                    | 1,000 0 0    |
| 21 "     | " cartage .....                              | 26              | 3 18 0     | 22 "     | Cement and cartage.....       | 6 13 0       |
| 9 June   | " .....                                      | 27              | 1 6 0      | 2 Jan.   | " .....                       | 277 1 8      |
| 9 "      | " cement .....                               | 28              | 12 10 0    | 10 "     | Cash .....                    | 1,296 6 0    |
| 1 "      | " .....                                      | 29              | 8 6 8      | 30 June  | Balance .....                 | 305 1 1      |
| 1 "      | " cartage .....                              | 30              | 0 10 8     |          |                               |              |
| 14 "     | " .....                                      | 31              | 10 0 0     |          |                               |              |
| 14 "     | " cement.....                                | 32              | 156 5 0    |          |                               |              |
| 16 "     | " .....                                      | 33              | 3 2 6      |          |                               |              |
| 16 "     | " .....                                      | 34              | 104 3 4    |          |                               |              |
| 16 "     | " cartage .....                              | 35              | 6 13 4     |          |                               |              |
| 16 "     | " .....                                      | 36              | 7 18 8     |          |                               |              |
| 16 "     | " cement.....                                | 37              | 123 19 2   |          |                               |              |
| 20 "     | " .....                                      | 38              | 80 4 2     |          |                               |              |
| 20 "     | " cartage .....                              | 39              | 5 2 8      |          |                               |              |
| 18 "     | " .....                                      | 40              | 25 0 0     |          |                               |              |
| 18 "     | " cement.....                                | 41              | 390 12 6   |          |                               |              |
| 30 "     | " .....                                      | 42              | 504 15 8   |          |                               |              |
| 6 Aug.   | " .....                                      | 43              | 186 9 2    |          |                               |              |
| 6 "      | " cartage .....                              | 44              | 11 18 8    |          |                               |              |
| 20 "     | " cement.....                                | 45              | 787 10 0   |          |                               |              |
| 15 "     | " cartage .....                              | 46              | 84 5 4     |          |                               |              |
| 15 "     | " cement.....                                | 47              | 1,316 13 4 |          |                               |              |
| 9 Oct.   | " charges .....                              | 48              | 1 18 4     |          |                               |              |
| 6 Nov.   | " cement.....                                | 49              | 26 0 10    |          |                               |              |
| 1895.    |  |                 |            |          |                               |              |
| 10 Jan.  | " .....                                      | 50              | 104 3 4    |          |                               |              |
| 21 "     | " rent .....                                 | 51              | 3 7 4      |          |                               |              |
| 13 Feb.  | " charges .....                              | 52              | 3 11 3     |          |                               |              |
| 15 Mar.  | " cement.....                                | 53              | 130 4 2    |          |                               |              |
| 15 "     | " charges (cart'ge).....                     | 54              | 8 6 8      |          |                               |              |
| 19 June  | " cement.....                                | 55              | 52 1 8     |          |                               |              |
| 19 "     | " cartage .....                              | 56              | 3 6 8      |          |                               |              |
|          |  |                 |            |          |                               |              |
|          |  | £ ...           | 5,676 15 2 |          |                               | £ 5,676 15 2 |

| 1895.    |                     | No of Invoice |       |    | 1895. |         | £ s. d. |       |       |    |   |
|----------|---------------------|---------------|-------|----|-------|---------|---------|-------|-------|----|---|
| 8 July   | To Balance          |               | 305   | 1  | 1     | 5 Nov.  | By Cash | 2,946 | 16    | 11 |   |
|          | Invoice of cement   | 57            | 52    | 1  | 8     | 1896.   |         |       |       |    |   |
| 8 "      | " cartage           | 58            | 3     | 6  | 8     | 17 Mar. | "       | 1,066 | 0     | 0  |   |
| 17 "     | " cement            | 59            | 378   | 2  | 6     | 30 June | Balance | 386   | 19    | 4  |   |
| 27 "     | " "                 | 60            | 126   | 0  | 10    |         |         |       |       |    |   |
| 6 Aug.   | " "                 | 61            | 26    | 0  | 10    |         |         |       |       |    |   |
| 6 "      | " cartage           | 62            | 1     | 13 | 4     |         |         |       |       |    |   |
| 19 "     | " cement            | 63            | 50    | 0  | 0     |         |         |       |       |    |   |
| 10 Sept. | " "                 | 64            | 500   | 0  | 0     |         |         |       |       |    |   |
| 16 "     | " "                 | 65            | 1,500 | 0  | 0     |         |         |       |       |    |   |
| 16 Oct.  | " "                 | 66            | 4     | 10 | 0     |         |         |       |       |    |   |
| 14 Nov.  | " "                 | 67            | 500   | 0  | 0     |         |         |       |       |    |   |
| 1 Dec.   | Cartage on pig iron | 68            | 4     | 0  | 0     |         |         |       |       |    |   |
| 28 "     | Invoice of cement   | 69            | 562   | 0  | 0     |         |         |       |       |    |   |
| 1896.    |                     |               |       |    |       |         |         |       |       |    |   |
| 16 May   | " "                 | 70            | 52    | 18 | 4     |         |         |       |       |    |   |
| 20 "     | " "                 | 71            | 12    | 14 | 0     |         |         |       |       |    |   |
| 19 "     | " "                 | 72            | 77    | 5  | 2     |         |         |       |       |    |   |
| 19 "     | " "                 | 73            | 12    | 14 | 0     |         |         |       |       |    |   |
| 8 June   | " "                 | 74            | 52    | 18 | 4     |         |         |       |       |    |   |
| 1 "      | " "                 | 75            | 22    | 4  | 6     |         |         |       |       |    |   |
| 6 "      | " "                 | 76            | 52    | 18 | 4     |         |         |       |       |    |   |
| 1 "      | " "                 | 77            | 26    | 9  | 2     |         |         |       |       |    |   |
| 15 "     | " "                 | 78            | 51    | 5  | 0     |         |         |       |       |    |   |
| 26 "     | " "                 | 79            | 25    | 12 | 6     |         |         |       |       |    |   |
|          |                     | £             | 4,399 | 16 | 3     |         |         | £     | 4,399 | 16 | 3 |
| 30 "     | Balance             | £             | 386   | 19 | 4     |         |         |       |       |    |   |

## COPY OF INVOICES.—Parbury, Henty, &amp; Co.—Messrs. Carter &amp; Co.

|          |   |                      |     |    |    |      |  |
|----------|---|----------------------|-----|----|----|------|--|
| 1892     |   |                      |     | £  | s. | d.   |  |
| 18 May   | Ex "Strathdon"—100 casks cement—Wouldham  | At 11s. 6d.          | 57  | 10 | 0  |      |  |
|          | Extra cartage to Demison street, Waverley   | 7s.                  | 2   | 18 | 4  |      |  |
|          |   |                      | 60  | 8  | 4  | (1)  |  |
| 28 July  | Ex "Wavertree"—150 casks cement—Wouldham  | 11s. 3d.             | 84  | 7  | 6  |      |  |
|          | Extra cartage   | 7s.                  | 4   | 7  | 6  |      |  |
|          |   |                      | 88  | 15 | 0  | (2)  |  |
| 21 Sept. | Ex "Brilliant"—50 casks cement—Wouldham   | 11s. 3d.             | 28  | 2  | 6  | (3)  |  |
| 24 "     | Ex "Indrapura"—699 casks cement—Wouldham  | 11s. 3d.             | 393 | 3  | 9  | (4)  |  |
| 21 "     | Ex "Illawarra"—250 casks cement—Wouldham  | 11s. 3d.             | 140 | 12 | 6  | (5)  |  |
| 25 Oct   | Extra expense in delivering 899 casks cement to North Sydney (699 ex "Indrapura," 200 ex "Illawarra").        | 5d.                  | 18  | 14 | 7  | (6)  |  |
| 22 "     | Ex "Oakhurst"—60 boxes candles, each 25 packets = 1,500 packets (all faults)                                  | 5½d.                 | 35  | 18 | 9  | (7)  |  |
| 24 "     | Ex "Bungaree"—925 casks cement—Wouldham.  | 10s. 10½d.           | 502 | 19 | 5  | (8)  |  |
| 29 Nov.  | (See 1 returns)—ex "Carnbulg" (net cash)—allowance on 1,000 casks cement (taken over by P. H. & Co.)—Wouldham | 7½d.                 | 31  | 5  | 0  | (9)  |  |
| 1893     |   |                      |     |    |    |      |  |
| 20 Feb.  | Ex "Olive"—50 boxes candles (all faults), each 25 packets = 1,250   | 6d.                  | 31  | 5  | 0  | (10) |  |
| 30 June  | Ex "Leyland Bros." (North Shore—Chester)—500 casks cement—Wouldham  | 10s. 3d.             | 256 | 5  | 0  | (11) |  |
| 7 July   | Ex "Hohenzollern"—50 boxes D.R.J. candles, each 25 packets = 1,250  | 6½d.                 | 33  | 17 | 1  |      |  |
|          | Extra cartage   |                      | 0   | 3  | 6  |      |  |
|          |   |                      | 34  | 0  | 7  | (12) |  |
| 1894.    |   |                      |     |    |    |      |  |
| 24 Jan.  | Ex "Stassfurt"—50 boxes D.R.J. candles, each 25 packets = 1,250   | 6½d.                 | 34  | 10 | 1  | (13) |  |
| 24 "     | Ex "Leyland Bros." (Marrickville)—562 casks cement—Wouldham   | In store, at 10s 3d. | 288 | 0  | 6  |      |  |
|          | Ex "Pericles" (Marrickville)—273 casks cement—Wouldham  | At 10s. 3d.          | 139 | 18 | 3  |      |  |
|          | Ex "Cromdale"   | 10s. 3d.             | 89  | 3  | 6  |      |  |
|          |   |                      | 517 | 2  | 3  | (14) |  |
|          | Ex "Leyland Bros."—cartage on 562 casks cement  | 8d.                  | 18  | 14 | 8  |      |  |
|          | Ex "Pericles"—cartage on 273 casks cement   | 8d.                  | 9   | 2  | 0  |      |  |
|          | Ex "Cromdale"   | 8d.                  | 5   | 16 | 0  |      |  |
|          |   |                      | 33  | 12 | 8  | (15) |  |

|         |   | £                       | s.  | d. |         |
|---------|---|-------------------------|-----|----|---------|
| 1894.   |   |                         |     |    |         |
| 31 Jan. | Ex "Cressington" (delivered to Melloy, carrier, for Marrickville)—400 casks cement—Wouldham | In store, at 10s. 5d... | 208 | 6  | 8 (16)  |
| 6 April | Ex "Sommerfeld"—50 boxes D.R.J. candles, each 25 packets = 1,250                            | At 6½d.                 | 33  | 17 | 1 (17)  |
| 14 "    | Ex "Indramayo" (Marrickville)—180 casks cement—Wouldham                                     | On wharf, at 10s. 5d.   | 93  | 15 | 0 (18)  |
| 14 "    | Ex "Indramayo"—cartage on 180 casks cement (prompt net cash)                                | At 8d.                  | 6   | 0  | 0 (19)  |
| 2 May   | Ex "Indramayo" (Marrickville)—160 casks cement—Wouldham (prompt net cash)                   | On wharf, at 10s. 5d.   | 83  | 6  | 8 (20)  |
|         | Cartage on 160 casks cement   | At 8d.                  | 5   | 6  | 8 (21)  |
| 11 May  | Ex "Warrigal" (see below)—199 casks cement—Wouldham   | ,, 10s. 5d.             | 103 | 12 | 11 (22) |
| 11 "    | Ex "Warrigal" (Marrickville)—prompt net cash—Cartage on 151 casks cement                    | ,, 8d.                  | 5   | 0  | 8       |
|         | Cartage on 24 casks cement to N. Shore  | ,, 1s. 1d.              | 1   | 6  | 0       |
|         | ,, 24 ,, Drummoyne  | ,, 1s. 4d.              | 1   | 12 | 0       |
|         |   |                         | 7   | 18 | 8 (23)  |
| 23 "    | Ex "Solingen"—50 boxes D.R.J. candles, each 25 packets = 1,250                              | At 6½d.                 | 33  | 17 | 1 (24)  |
| 21 "    | Ex "Innamincka" (Marrickville)—117 casks cement—Gillingham (prompt net cash)                | On wharf, at 10s. 5d.   | 60  | 18 | 9 (25)  |
|         | Cartage on 117 casks cement   | At 8d.                  | 3   | 18 | 0 (26)  |
|         | 116 see No. (2) Returns.  |                         |     |    |         |
| 9 June  | Ex "Star of England" (Marrickville)—24 casks cement—Wouldham (prompt net cash)              | In store, at 10s. 5d... | 12  | 10 | 0 (28)  |
|         | Cartage on 24 casks cement  | At 1d. 1d.              | 1   | 6  | 0 (27)  |
| 1 "     | Ex "Star of England" (Marrickville)—12 casks cement—Wouldham                                | In store, at 10s. 5d... | 6   | 5  | 0       |
|         | Ex "Indramayo" (Marrickville)—4 casks cement—Wouldham—delivered 11/5/94 (prompt net cash)   | ,, 10s. 5d...           | 2   | 1  | 8       |
|         |   |                         | 8   | 6  | 8 (29)  |
|         | Cartage on 16 casks cement  | At 8d.                  | 0   | 10 | 8 (30)  |
| 14 "    | Ex "Dartford"—cartage on 172 casks cement   | ,, 8d.                  | 5   | 14 | 8       |
|         | Ex "Derwent"—cartage on 128 casks cement (prompt net cash)                                  | ,, 8d.                  | 4   | 5  | 4       |
|         |   |                         | 10  | 0  | 0 (31)  |
| 14 "    | Ex "Dartford" (Marrickville)—172 cask cement—Wouldham                                       | On wharf, at 10s. 5d.   | 89  | 11 | 8       |
|         | Ex "Derwent" (47 Marrickville)—128 casks cement—Wouldham                                    | ,, 10s. 5d.             | 66  | 13 | 4       |
|         |   |                         | 156 | 5  | 0 (32)  |
| 16 "    | Ex "Miltiades" (Marrickville)—200 casks cement—Wouldham (prompt net cash)                   | On wharf, at 10s. 5d.   | 104 | 3  | 4 (34)  |
|         | Cartage on 200 casks cement   | At 8d.                  | 6   | 13 | 4 (35)  |
| 16 "    | Ex Store (not traced)—6 casks cement—Germania   | In store, at 10s. 5d... | 3   | 2  | 6 (33)  |
| 16 "    | Ex "Gulf of Taranto" (Marrickville)—238 casks cement—Wouldham (prompt net cash)             | On wharf, at 10s. 5d.   | 123 | 19 | 2 (37)  |
|         | Cartage on 238 casks cement   | At 8d.                  | 7   | 18 | 8 (36)  |
| 20 "    | Ex "Star of England"—Cartage on 150 casks cement  | ,, 8d.                  | 5   | 0  | 0       |
|         | Ex "Derwent"—Cartage on 4 casks cement (prompt net cash)                                    | ,, 8d.                  | 0   | 2  | 8 (39)  |
|         |   |                         | 5   | 2  | 8       |
| 20 "    | Ex "Star of England" (Marrickville)—150 casks cement—Wouldham                               | In store, at 10s. 5d... | 78  | 2  | 6       |
|         | Ex "Derwent" (not traced)—4 casks cement—Wouldham   | ,, 10s. 5d...           | 2   | 1  | 8       |
|         |   |                         | 80  | 4  | 2 (38)  |
| 18 "    | Ex "Culgoa" (Marrickville)—750 casks cement—Wouldham (prompt net cash)                      | On wharf, at 10s. 5d.   | 390 | 12 | 6 (41)  |
|         | Cartage on 750 casks cement   | At 8d.                  | 25  | 0  | 0 (40)  |

|   |                 |   |                                    | £     | s  | d  |      |
|---|-----------------|---|------------------------------------|-------|----|----|------|
| 1894  | 30 June         | Ex "Australasian"—977 casks cement—Wouldham<br>(See T Chester's lighterage a/c, 5/6/94)   | Delivered by lighter,<br>at 10s 4d | 504   | 15 | 8  | (42) |
|   | 6 Aug.          | Ex "Patriarch" (Marrickville)—358 casks cement—Wouldham (prompt net cash)   | On wharf, at 10s 5d                | 186   | 9  | 2  | (43) |
|   |                 | Cartage on 358 casks cement   | At 8d                              | 11    | 18 | 8  | (44) |
|   | 20 Sept         | Ex "Cairnbulg"—1,500 casks cement—Wouldham  | ...., 10s 6d                       | 787   | 10 | 0  | (45) |
|   | 15 "            | Ex "Neotsfield"—cartage on 2,528 casks cement   | .., 8d                             | 84    | 5  | 4  | (46) |
| (6) 100 off<br>(7) 30 "<br>12 "<br>12 "<br>500 "<br>654 "<br>797 to Mar<br>rickville<br>1,451 | 15 "            | Ex "Neotsfield"—2,528 casks cement—Gostling—1,072 casks delivered Marrickville, 1,456 casks stored Grafton Bond                     | On wharf, at 10s 5d                | 1,316 | 13 | 4  | (47) |
|   | 9 Oct           | Ex "Neotsfield"—charges on 500 casks cement stored Grafton Bond—<br>Rent<br>Receiving and delivering                                |                                    | 0     | 17 | 4  |      |
|   |                 |   |                                    | 1     | 1  | 0  |      |
|   |                 | Prompt net cash   |                                    | 1     | 18 | 4  | (48) |
|   | 6 Nov           | Ex "Cairnbulg" (Marrickville)—per Melloy, from store—50 casks cement—Wouldham   | In store, at 10s 5d                | 26    | 0  | 10 | (49) |
|   | 1895.<br>10 Jan | Ex "Cairnbulg"—delivered to Melloy, for Marrickville—200 casks cement—Wouldham  | .., at 10s 5d                      | 104   | 3  | 4  | (50) |
|   | 21 "            | Ex "Neotsfield"—rent on 202 casks cement—Gostling—from 14 September to 31 December, 16 weeks, at 1s 4d per cask per week (net cash) | .                                  | 3     | 7  | 4  | (51) |
|   | 13 Feb.         | Ex "Neotsfield"—charges on balance of cement—<br>Bond charges<br>Rent   |                                    | 3     | 3  | 4  |      |
|   |                 |   |                                    | 0     | 7  | 11 |      |
|   |                 | Net cash  |                                    | 3     | 11 | 3  | (52) |
|   | 15 Mar.         | Ex "Macquarie"—cartage on 250 casks cement (prompt net cash)  | 8d                                 | 8     | 6  | 8  | (54) |
|   | 15 "            | Ex "Macquarie" (Marrickville)—250 casks cement—Wouldham   | In store, at 10s 5d                | 130   | 4  | 2  | (53) |
|   | 19 June         | Ex "Afghanistan" (Marrickville)—100 casks cement—Hemmoor (prompt net cash)  | .., at 10s 5d                      | 52    | 1  | 8  | (55) |
|   |                 | Cartage on 100 casks cement   | 8d                                 | 3     | 6  | 8  | (56) |
|   | 8 July          | Ex "Afghanistan" (Marrickville)—100 casks cement—Hemmoor (net cash)   | In store, at 10s 5d                | 52    | 1  | 8  | (57) |
|   |                 | Cartage on 100 casks cement   | 8d                                 | 3     | 6  | 8  | (58) |
|   | 17 July         | Ex "Afghanistan" (Marrickville)—750 casks cement—Hemmoor  | At 10s                             | 375   | 0  | 0  |      |
|   |                 | Extra cartage, as arranged  | .., 1d                             | 3     | 2  | 6  |      |
|   |                 | Net cash  |                                    | 378   | 2  | 6  | (59) |
|   | 27 "            | Ex "Afghanistan" (Marrickville)—250 casks cement—Hemmoor  | .., 10s                            | 125   | 0  | 0  |      |
|   |                 | Extra cartage   | .., 1d                             | 1     | 0  | 10 |      |
|   |                 | Net cash  |                                    | 126   | 0  | 10 | (60) |
|   | 6 Aug           | Ex "Afghanistan" (Marrickville)—50 casks cement—Hemmoor (prompt net cash)   | On wharf, at 10s 5d                | 26    | 0  | 10 | (61) |
|   |                 | Cartage on 50 casks cement  | At 8d                              | 1     | 13 | 4  | (62) |
|   | 19 "            | Ex "Afghanistan"—100 casks cement—Hemmoor (net cash)  | .., 10s                            | 50    | 0  | 0  | (63) |
|   | 10 Sept.        | Ex "Sommerberg"—lightered 200 to Grant's Wharf, North Sydney, 800 to Annandale 1,000 casks cement—Condor (net cash)                 | .., 10s                            | 500   | 0  | 0  | (64) |
|   | 16 "            | Ex "Ross shire"—lightered to Annandale, 1,000 casks cement—Hemmoor  | .., 10s                            | 500   | 0  | 0  |      |
|   |                 | Lightered to Annandale, 2,000 casks cement—Germania   | .., 10s                            | 1,000 | 0  | 0  |      |
|   |                 | Net cash  |                                    | 1,500 | 0  | 0  | (65) |
|   | 16 Oct          | Ex "Ross shire"—9 casks cement—Hemmoor  | Net cash .., 10s                   | 4     | 10 | 0  | (66) |
|   | 14 Nov          | Ex "Lady Palmerston" (Annandale)—1,000 casks cement—Josson (net cash)   | .., 10s                            | 500   | 0  | 0  | (67) |
|   | 1 Dec           | Ex "Port Jackson"—cartage on 10 tons pig iron to and from Annandale (prompt net cash)   |                                    | 4     | 0  | 0  | (68) |
|   | 28 "            | Ex "Coramandel" (Annandale)—1,124 casks cement—Josson (net cash)  | .., 10s . . . .                    | 562   | 0  | 0  | (69) |



| 1896   |   |           | £  | s  | d |      |
|--------|---|-----------|----|----|---|------|
| 16 May | Ex "Ross shire" (Leichhardt)—100 casks cement—Hemmoor Delivered to Leichhardt | At 10s 7d | 52 | 18 | 4 | (70) |
| 20 "   | Ex "Ross shire"—24 casks cement—Hemmoor                                       | " 10s 7d  | 12 | 14 | 0 | (71) |
| 19 "   | Ex "Ross shire"—114 casks cement—Hemmoor                                      | " 10s 7d  | 60 | 6  | 6 |      |
|        | Ex "Achilles" (Rozelle)—32 casks cement—Hemmoor                               | " 10s 7d  | 16 | 18 | 8 |      |
|        |   |           | 77 | 5  | 2 | (72) |
| 19 "   | Ex "Ross shire"—24 casks cement—Hemmoor                                       | " 10s 7d  | 12 | 14 | 0 | (73) |
| 8 June | Ex "Lord Elgin" (Leichhardt)—100 casks cement—Germania                        | " 10s 7d  | 52 | 18 | 4 | (74) |
| 1 "    | Ex "Lord Elgin" (Leichhardt)—30 casks cement—Germania                         | " 10s 7d. | 15 | 17 | 6 |      |
|        | Ex "Ross shire" (Leichhardt)—12 casks cement—Hemmoor                          | " 10s 7d. | 6  | 7  | 0 |      |
|        |   |           | 22 | 4  | 6 | (75) |
| 6 "    | Ex "Lord Elgin"—100 casks cement—Germania                                     | " 10s 7d. | 52 | 18 | 4 | (76) |
| 1 "    | Ex "Lord Elgin"—50 casks cement—Germania (192)                                | " 10s 7d  | 26 | 9  | 2 | (77) |
| 15 "   | Ex "Achilles" (Parsons, Sydney)—100 casks cement—Hemmoor                      | " 10s 3d  | 51 | 5  | 0 | (78) |
| 26 "   | Ex "Achilles" (Parsons, Sydney)—50 casks cement—Hemmoor                       | " 10s 3d  | 25 | 12 | 6 | (79) |

## COPY OF CREDIT NOTES — PARBURY, HENLY, &amp; Co

| 1892       |   |                      | £   | s  | d  |  |
|------------|---|----------------------|-----|----|----|--|
| 29 Nov     | Ex "Bungaree" (See No 8)—925 casks cement—Wouldham      | At 10s 3d            | 474 | 1  | 3  |  |
| 1894       |   |                      |     |    |    |  |
| 22 June    | Ex "Innamncka" (See No. 25)—116 casks cement—Gillingham | " 10s 5d             | 60  | 8  | 4  |  |
|            | Cartage   | " 8d.                | 3   | 17 | 4  |  |
|            |   |                      | 64  | 5  | 8  |  |
| 25 July    | Ex "Talavera" (Marrickville)—150 casks cement—Wouldham  | On wharf, at 10s 5d  | 78  | 2  | 6  |  |
|            | Cartage   | At 8d                | 5   | 0  | 0  |  |
|            |   |                      | 83  | 2  | 6  |  |
| 27 August  | Ex "Talavera" (Marrickville)—98 casks cement—Wouldham   | In store, at 10s 5d  | 51  | 0  | 10 |  |
|            | Cartage   | At 8d.               | 3   | 5  | 4  |  |
|            |   |                      | 54  | 6  | 2  |  |
| 7 Sept     | Ex "Talavera" (Marrickville)—584 casks cement—Wouldham  | " 10s 5d             | 304 | 3  | 4  |  |
|            | Cartage   | " 8d.                | 19  | 9  | 4  |  |
|            |   |                      | 323 | 12 | 8  |  |
| 31 October | Ex "Neotsfield" (See No 47)—100 casks cement—Gostling   | On wharf, at 10s 5d. | 52  | 1  | 8  |  |
|            | Cartage   | At 8d                | 3   | 6  | 8  |  |
|            |   |                      | 55  | 8  | 4  |  |
| 7 Nov      | Ex "Neotsfield" (See No 47)—30 casks cement—Gostling    | " 10s 5d             | 15  | 12 | 6  |  |
|            | Cartage   | " 8d                 | 1   | 0  | 0  |  |
|            |   |                      | 16  | 12 | 6  |  |
| 12 "       | Ex Store—12 casks cement—Wouldham—net cash              | " 13s 2d             | 7   | 18 | 0  |  |
| 20 "       | Ex "Neotsfield" (See No 47)—12 casks cement—Gostling    | " 10s 5d.            | 6   | 5  | 0  |  |
|            | Cartage   | " 8d.                | 0   | 8  | 0  |  |
|            |   |                      | 6   | 13 | 0  |  |
| 22 Dec     | Ex "Neotsfield" (See No 47)—12 casks cement—Gostling    | " 10s 5d             | 6   | 5  | 0  |  |
|            | Cartage   | " 8d                 | 0   | 8  | 0  |  |
|            |   |                      | 6   | 13 | 0  |  |
| 1895       |   |                      |     |    |    |  |
| 2 Jan      | Ex "Neotsfield" (See No 47)—500 casks cement—Gostling   | " 10s 5d             | 260 | 8  | 4  |  |
|            | Cartage   | " 8d                 | 16  | 13 | 4  |  |
|            |   |                      | 277 | 1  | 8  |  |

## COPY OF LEDGER ACCOUNT, MESSRS CARTER &amp; Co, Forest Lodge, in account with Henry Austin.

|            |                        | £ s. d.    |             |                                     | £ s. d.  | £ s. d.     |
|------------|------------------------|------------|-------------|-------------------------------------|----------|-------------|
| 1891.      |                        |            | 1891.       |                                     |          |             |
| 10 Mar.    | To goods, cement . . . | 698 10 8   | 10 Mar.     | By P.N. due 13 June, 1891           | 699 4 8  |             |
| 20 April   | " "                    | 521 11 0   | 20 April    | By P N due 23 August                | 261 0 9  |             |
| 22 July    | " "                    | 343 0 2    | 20 "        | " "                                 | 261 0 9  |             |
| 1 Aug.     | " "                    | 147 14 3   | 22 July     | " 25 Nov.                           | 273 11 5 |             |
| 30 "       | " "                    | 458 2 9    | 1 Aug       | " 4 Dec.                            | 147 17 3 |             |
| 30 "       | " "                    | 519 8 3    |             |                                     |          | 1,642 14 10 |
| 31 "       | To P N. stamps         | 2 13 0     | 31 "        | By goods (cement lent), £69 14s 5d, |          |             |
|            |                        |            |             | £8 9s.                              |          | 78 3 3      |
|            |                        |            | 31 "        | " balance                           |          | 970 2 0     |
|            |                        | 2,691 0 1  |             |                                     |          | 2,691 0 1   |
| 1 Sept     | To balance             | 970 2 0    | 17 Dec.     | By cash, £205; discount, £5         |          | 210 0 0     |
| 1891 92    |                        |            | 1892        |                                     |          |             |
| Oct -1 Au. | " goods, cement        | 3,749 9 6  | 30 Jan.     | " cement, loaned                    |          | 11 5 0      |
|            | " P.N. stamps          | 3 0 0      | 11 Mar.     | " " rejected                        |          | 170 5 0     |
| 1892.      |                        |            | 30 April    | " contribution for shed             |          | 10 0 0      |
| 9 Mar.     | " cable                | 1 9 2      | 1891-92     |                                     |          | 3,853 3 3   |
| 31 Aug.    | " P.N. stamps          | 0 9 6      | Aug -23 May | " P N's                             |          |             |
|            |                        | 4,724 10 2 |             | " charges account on exchange,      |          | 0 6 0       |
|            |                        |            |             | P N. stamps                         |          | 469 10 11   |
| 1893.      |                        |            | 1892        | " P.N                               |          | 4,724 10 2  |
| 15 July    | To goods, cement       | 195 0 0    | 27 July     |                                     |          |             |
| 24 "       | " "                    | 488 9 6    |             |                                     |          |             |
| 25 Sept    | " P N stamp            | 0 14 0     |             |                                     |          |             |
|            |                        | 684 3 6    | 1893.       |                                     |          |             |
|            |                        |            | 25 Sept     | By P N. due 28 January, 1894        |          | 684 3 6     |

## COPY OF INVOICES (HENRY AUSTIN).

| Date        | Amount   | No Casks | (2) Brand | Delivered.                            | Ex Ship                    |
|-------------|----------|----------|-----------|---------------------------------------|----------------------------|
| 1891.       | £ s d    |          |           |                                       |                            |
| 10 March    | 698 10 8 | 992      | Germania  | Forest Lodge                          | Wilhelmina.                |
| 20 April    | 521 11 0 | 732      |           |                                       |                            |
| 22 July     | 343 0 2  | 482      | Germania  | { 50 Forest Lodge<br>432 Shea's Creek | { Solingen.<br>Kenyon.     |
|             |          |          |           | 482                                   |                            |
| 1 August    | 147 14 3 | 209      | "         | { 144 Forest Lodge<br>65 Shea's Creek | { Pluto.                   |
| 30 "        | 458 2 9  | 643      | "         | 209 Shea's Creek                      | Bargany.                   |
| 30 "        | 519 8 3  | 729      | "         |                                       | John of Gaunt.             |
| 8 October   | 267 18 0 | 376      | "         | Shea's Creek                          | M. Deursen.                |
| 6 November  | 210 0 0  | 300      | Alsen's   | "                                     | (Bought from H. Haeg & Co) |
| 13 "        | 289 19 9 | 407      | Germania  | "                                     | Superb                     |
| 1892.       |          |          |           |                                       |                            |
| 12 February | 110 16 8 | 175      | "         | Glebe                                 | Drumlanrig                 |
| 20 "        | 295 16 0 | 464      | "         | Waverley                              | "                          |
| 18 "        | 276 13 6 | 434      | "         | "                                     | Lottie                     |
| 22 April    | 70 2 6   | 110      | "         | "                                     | Helen Scott and others.    |
| 30 "        | 386 17 6 | 619      | "         | Gummow and Gellan                     | " "                        |
| 30 "        | 620 9 10 | 967      | "         | Shea's Creek                          | " "                        |
| 7 May       | 633 13 6 | 994      | "         | "                                     | " "                        |
| 23 "        | 117 6 0  | 184      | "         | "                                     | Paposo                     |
| 11 July     | 206 17 6 | 331      | "         | Gummow and Gellan                     | Formosa.                   |
| 11 August   | 260 14 9 | 409      | "         | Waverley                              | Olga                       |
| 1893.       |          |          |           |                                       |                            |
| 15 July     | 195 0 0  | 400      | "         | (In Lighter)                          | Argo                       |
| 24 "        | 488 9 6  | 1,002    | "         | "                                     | M E. Watson.               |

## COPY OF CREDIT NOTES (HENRY AUSTIN).

Cement loaned, 14th March to 10th July, 1891  
Brand, "Germania"—15 casks to Douz Bros.; 24 casks to Josephs; 24 casks to Allum Bros, 24 casks to Allum Bros.; 12 casks to Allum Bros. Total, 99 casks—£69 14s. 3d

Cement loaned, 12th August, 1891  
Brand, "Germania"—12 casks to Allum Bros. (delivered Liverpool street); £8 9s.

Cement loaned, 30th January, 1892.  
Brand, "Germania"—18 casks for Forest Lodge; £11 5s

Cement rejected, 11th March, 1892  
Brand, "Germania"—252 casks, ex "Drumlanrig", £170 5s

## COPY OF MESSRS BURNS, PHILP, &amp; Co.'s INVOICE.

Messrs Carter &amp; Co, Box 10, P O, North Sydney.

Sydney, 14 July, 1893.

Bought of Burns, Philp, &amp; Co. (Limited).

Terms—Cash in thirty days less 2½ per cent or four months P.N.

Ex "Miltiades"—1,000 casks "Anchor" cement, D.P. in ship's slings, 9s 9d —£487 10s.  
Order on the ship enclosed

## Appendix No. 32.

SCHEDULE OF TENDERS RECEIVED BY TENDER BOARD.

Wednesday, 10 June, 1891.

LIST of Tenders received for construction of the North Shore Main Outfall Sewer, from near Long Bay to Mount-street.

|                                  |  |
|----------------------------------|--|
| Number of tenders received ..... | Seven.   |
| Estimated amount .....           | £43,494 10s. 6d.   |
| Amount of lowest tender .....    | £36,900.   |
| Name of lowest tenderer .....    | Messrs. Bond and Hudson.                                   |
| Vote .....                       | Balance of £107,000, North Shore Drainage. 53 Vic. No. 23. |

|                            | Amount.     | Deposit. | Nature. |
|----------------------------|-------------|----------|---------|
| 1. Bond and Hudson .....   | £36,900 0 0 | £369     | Cheque. |
| 2. Carter & Co. ....       | 39,890 0 0  | 400      | "       |
| 3. Gummow and Gillan ..... | 40,840 0 0  | 410      | "       |
| 4. D. Sheehy .....         | 45,980 18 8 | 500      | "       |
| 5. J. McSweeney .....      | 48,146 12 4 | 480      | "       |
| 6. Lemon and Spencer ..... | 56,563 10 0 | 500      | "       |
| 7. Jno. Taylor & Co. ....  | 58,011 0 0  | 500      | "       |

D. C. McLACHLAN,  
10/6/91.I recommend acceptance of Bond and Hudson's tender at schedule rates.—R.H., 10/6/91. Under Secretary.  
J. BARLING, Vice-President of Tender Board.

## Appendix No. 33.

Contract No. 72.—Munni-street Sewer.

Sir,

St. John's Road, Glebe, 15 February, 1892.

We have the honor to forward herewith our account in connection with Sewerage Contract No. 72, amounting to £6,625 2s., and we beg to request that you will issue a certificate in our favour for that amount.

A further account for day-work, now in progress, and for maintenance will be forwarded on the expiration of our contract period of maintenance, when we will ask that the amount of our deposit, viz., £900, may be refunded to us.

The Engineer-in-Chief, Sewerage, Sydney.

We are, &c.,  
CARTER & CO.

For report.—R.H., 18/2/92. Mr. Davis.—C.H.O.-B., 22/2/92. This matter has now been settled, I understand. The contractors have signed the office measurements accepting them.—J.D., 26/2/92. Mr. Bagge. This paper might now be put aside, in accordance with Mr. Davis' minute.—C. H. OHLFSEN-BAGGE, 26/2/92. Engineer-in-Chief.

## STATEMENT OF ACCOUNT.

| Item. | Description of Work.   | Quantity. | Rate.  | Amount. | Total.      | Remarks.  |
|-------|--|-----------|--------|---------|-------------|---|
|       |  |           |        | £ s. d. | £ s. d.     |   |
| 1     | Excavation .....   | 43,336    | c. y.  | 2/6     | 5,417 0 0   |   |
| 2     | Filling .....  | 22,620    | "      | 1/-     | 1,131 0 0   |   |
| 5     | Sandstone concrete .....   | 6,015.75  | "      | 34/-    | 10,226 15 6 |   |
| 6     | Cement rendering .....   | 8,175     | s. y.  | 2/6     | 1,021 17 6  |   |
| 7     | 24" earthenware pipes .....  | 56        | l. y.  | 15/-    | 42 0 0      |   |
| 9     | 18" " " .....  | 42        | "      | 7/-     | 14 14 0     |   |
| 9     | 18" " " (extra) .....  | 5         | "      | 7/-     | 1 15 0      | 5 bends.  |
| 12    | 6" " " .....   | 88        | "      | 2/-     | 8 16 0      |   |
| 12    | 6" " " (extra) .....   | 23        | "      | 2/-     | 2 6 0       | 23 bends.   |
| 14    | Sheet piling .....   | 51        | c. ft. | 4/-     | 10 4 0      |   |
| 16    | Timber left in trenches .....  | 337       | "      | 6d.     | 8 8 6       |   |
| 17    | Sandstone pitchers .....   | 2.5       | s. y.  | 15/-    | 1 17 6      |   |
| 18    | Ironwork in girders .....  | 393.7     | cwt.   | 25/-    | 492 2 6     |   |
| 19    | Gratings .....   | 7         | No.    | 90/-    | 31 10 0     |   |
| 20    | Manhole covers .....   | 2         | "      | 200/-   | 20 0 0      |   |
| 22    | Puddle .....   | 9         | c. y.  | 2/6     | 1 2 6       |   |
| 26    | Oregon timber .....  | 6.5       | c. ft. | 2/-     | 0 13 0      |   |
| 27    | Wrought iron .....   | 1,826.33  | lbs.   | 6d.     | 45 13 2     |   |
| 28    | Portland cement .....  | 1½        | casks  | 20/-    | 1 10 0      |   |
| A     | Gas-pipes as ordered—cost and 20 per cent. profit.                                       | .....     | .....  | .....   | 8 7 10      | Vouchers furnished —<br>£6 9s. 10d.                                       |
| B     | Sods—cut and stacked .....   | 1,000     | s. y.  | 8d.     | 33 6 8      | Before work was countermanded.  |
| C     | Timber in foundations ordered on account of works shown on contract drawings and wasted. | 1,000     | c. ft. | 1/6     | 75 0 0      | } At Outlet works.  |
| D     | Ballast filling ordered in place of above.   | 140       | c. y.  | 8d.     | 56 0 0      |   |
| E     | Bull-nosing sandstone concrete ...   | 800       | l. y.  | 6d.     | 20 0 0      |   |
| F     | Ribs for centres—superseded by alteration of design.                                     | 11        | No.    | 40/-    | 22 0 0      | At commencement of contract and at 0ms. 31chs.                            |
| G     | Cleaning out sewer below fluming, labourer.  | 20        | dys.   | 10/-    | 10 0 0      | Caused through faulty design.   |
| H     | Altering and refixing temporary fluming.   | .....     | .....  | .....   | 12 0 0      | At 32 chs. (temporary inlet).   |
|       | <i>Losses by withdrawal of Contract Work.</i>  |           |        |         | 18,715 19 8 |   |
|       | Rent of Knight's paddock .....   | 40        | weeks  | 5/-     | 10 0 0      | Required for storage purposes, Macdonald-st.                              |
|       | Sandstone for concrete, broken and stacked.  | 1,000     | c. y.  | 8/-     | 400 0 0     | Material purchased before withdrawal of work.                             |
|       | Portland cement .....  | 1,300     | casks  | 14/9    | 958 15 0    | " "   |
|       | " loss on sale .....   | 2,000     | "      | 2/6     | 250 0 0     | " "   |
|       | Gratings .....   | 25        | No.    | 70/-    | 87 10 0     | " "   |
|       | Manhole covers .....   | 4         | "      | 150/-   | 30 0 0      | " "   |
|       | Interest on expenditure, £3,211 5s.  | 3         | mos.   | 8 %     | 64 4 6      | " "   |
|       | Valuation of plant on ground for completion of contract.                                 | .....     | .....  | .....   | 500 0 0     | Cost of cement sold is included in £3,211 5s.                             |
|       | Loss of profit on work withdrawn   | £7,000    | @      | 25 %    | 1,750 0 0   | The greatest profit would have accrued from this portion of the contract. |
|       |  |           |        |         | 4,050 9 6   |   |
|       |  |           |        |         | 22,766 9 2  |   |
|       | Credit by payments due to Carter & Co.   | .....     | .....  | .....   | 16,141 7 2  |   |
|       |  |           |        |         | £6,625 2 0  |   |

**Appendix No. 34.**

CONTRACT 72.

13 October, 1891.

Gentlemen,  
With reference to your Contract No. 72, Sydney Sewerage Works (Munni-street to Shea's Creek Stormwater Channel), I have the honor to inform you that in accordance with clause No 3 of the specification, which gives me power to make such permanent alterations as may be considered necessary, I have decided to terminate the contract after the construction of the Junction Chamber and connection with the Macdonaldtown Park Stormwater Channel at 41·30 chains, thereby omitting that portion of the contract from such junction upwards to the point of termination of the sewer (as shown on drawings) at Union-street, and hereby give you notice that the Munni street Stormwater Channel is not to be carried on beyond the before-mentioned junction.

I have, &c ,  
R. R. P. HICKSON,  
Engineer-in-Chief for Sewerage.

Messrs. Carter &amp; Co., Contractors for Contract No. 72

**Appendix No. 35.**

CONTRACT 79

95. The concrete, after it has been approved of, to be conveyed to the work as may be directed, and as shall be approved of, and tipped into same and upon the surface of each layer from a height not exceeding 18 inches. Commencing at each part of the work at lowest level of excavation, the concrete to be brought up in horizontal and even layers, and on lines of sewer, branch and pipe sewers, junctions, gas check and shaft chambers, inspecting chambers, &c , unless where otherwise directed, in even layers parallel with specified longitudinal gradients of works ; each layer, when spread, to be 9 inches thick throughout before ramming, and, after spreading, to be quickly and evenly rammed all over until approved of, and then allowed time to set before the succeeding layer is put on.

**Appendix No. 36.**

CONTRACT 69.

*Extra Works—Omissions of Works.*

16. If at any time whilst the works are in hand it shall be deemed expedient by the Engineer to order material or work of a different description to that specified, or to increase or diminish the dimensions or extent of any works to be done under this contract, or to alter their situation or vary the form or dimensions of any of the said works, or of any part thereof, or to make any deviation or to substitute one class of work for another, he shall have full power to do so, and to order and direct any such increase, diminution, alteration, deviation, or substitution, and the works involved in any such increase, alteration, deviation, or substitution, shall be executed by the contractor if of the class of works provided for in the schedule of prices, at such schedule prices ; and no such increase, diminution, alteration, deviation, or substitution of works shall in any way annul or set aside this contract, or extend the time for the completion thereof, unless the Minister shall see fit to grant such extension ; but such additions or alterations shall be measured and paid for, or deducted from the contractor's account as the case may require, according to the schedule of prices. Provided that if any portion of the works so ordered to be done shall not be, in the opinion of the Engineer, of the same value or class of works provided for in the schedule of prices, the same shall be executed by the contractor at such prices as may be agreed upon with the Engineer ; but if the contractor and Engineer cannot agree as to the price to be paid, the Engineer may order and direct the same to be done by such person or persons as he may think fit. Before any extra work, or work of an altered value or class, is undertaken by the contractor, it shall be imperative for him to procure an order in writing from the Engineer for carrying out such extra or variation of work, and the contractor shall not be entitled to any payment for such extras or variations unless he produce the written order for the same, as aforesaid, and he shall not be entitled to plead that the Engineer omitted to give such written order, as it is to be distinctly understood that the onus of obtaining such order shall be on the contractor. The contractor shall not be entitled to any other rate than the schedule rate on any plea that the work was in a different position or of a different class from, or in a more difficult position than that shown on plan or specification, or carried out under circumstances not contemplated in the specification, unless an agreement entitling him to payment by other than the schedule rates shall have been previously made and signed by the Engineer and the contractor.

*Valuation of Omissions.*

17. The Engineer shall have the power to direct the omission of the carrying out of any part or parts of the said works, but not amounting to the omission of the whole ; and the value of such works so omitted in such case, calculated at the schedule rates, or in the event of there being no schedule rates, calculated on the basis of the proportionate value which such work bears to the lump sum, as ascertained by the Engineer, whose decision on that point shall be final, shall be deducted from the contract sum, subject, however, to arbitration clauses Nos. 36 to 41.

**Appendix No. 37.***Particulars of Landed Property held by Carter, Gummow, & Co.*

Detached cottage, Illawarra Road, Marrickville. Frontage, 35 ft 8 in. ; depth, 128 ft. 6 in. Certificate of title—Vol. 1,128, folio 191 ; in the name of John Carter, but held in trust by him for F. M. Gummow, G. Forrest, James Gillan, and self equally.

This is included in properties held as security by S. H. Weedon for loan of £2,000.

*Properties Mortgaged to S. H. Weedon*

Detached cottage and land, Illawarra Road, as above.  
Vacant land, Alfred-street, North Sydney, between Falcon-street and Ernest-street. Frontage, 99ft. ; depth, 132 ft. ; being part of Lot 16, Section 24, town of St. Leonards, parish of Willoughby.  
Vacant land, Miller-street, North Sydney, between Falcon-street and Ernest-street. Frontage, 75 ft. ; depth, 132 ft. ; being part of Lots 11 and 12, Section 18, town of St. Leonards, parish of Willoughby. Certificate of title in the name of John Carter, but held by him in trust for G. Forrest, D. Snodgrass, and self equally.  
Stables and land, Hill-street, North Sydney, between Miller-street and Elizabeth-street. Frontage, 30 ft. ; depth, 71 ft. or thereabouts ; being part of Lot 12, Section 2, town of St. Leonards, parish of Willoughby.

*Fixed Deposits, Carter, Gummow, & Co.*

|                                |                      |                      |
|--------------------------------|----------------------|----------------------|
| Bank of New Zealand, Adelaide, | £5,000               | Waterworks Contract. |
| "    "    Sydney,              | 650                  | Contract 79A.        |
| "    "    "    "               | 605                  | "    118.            |
| "    "    "    "               | 775                  | "    77.             |
| "    "    "    "               | 345                  | "    108.            |
| "    "    "    "               | 35                   | "    1.              |
| Current account, Adelaide,     | approximate : £2,000 | credit balance       |

*Particulars of Properties, Carter & Co*

Lodge Estate, Miller-street, North Sydney. Frontage, 330 ft. ; depth, 264 ft. ; area, 2 acres, with two dwelling houses thereon. Certificate of title 1,072 ; fols. 73, 74, 75 ; in the names of John Carter, George Forrest, and D. Snodgrass mortgaged to W. P. Manning and F. J. Partridge, for £4,500.

Vacant land, Miller street, between Falcon-street and Ernest-street. Frontage, 75 ft. ; depth, 132 ft. ; part of Lots 11 and 12, Section 18, St. Leonards, parish of Willoughby. Certificate of title in the name of J. Carter, but held in trust for G. Forrest, D. Snodgrass, and self equally. Included in mortgage to S. H. Weedon for £2,000.

Appendix No. 38.

TESTED Cement for Messrs. Carter & Co. and Carter, Gummow, & Co.  
(Extracted from Register of Cement Tests, Department of Public Works.)

| Register No. | Date          | For use at.                      | Bags. | Casks       | Distribution. |    |    |    |    |      |       |             |      |           | Remarks. |  |                               |
|--------------|---------------|----------------------------------|-------|-------------|---------------|----|----|----|----|------|-------|-------------|------|-----------|----------|--|-------------------------------|
|              |               |                                  |       |             | 53.           | 56 | 65 | 72 | 79 | 79A. | 69.   | 77          | 118. | 53 and 72 |          |  |                               |
| 1,075        | 10 July, 1894 | No. 79A . . . .                  |       | 1,300       |               |    |    |    |    |      | 1,300 |             |      |           |          |  |                               |
| 1,156        | 23 Nov., 1894 | 69 . . . . .                     |       | 1,300       |               |    |    |    |    |      | 1,300 |             |      |           |          |  |                               |
| 1,290        | 6 Aug., 1895  | 118 . . . . .                    | 1,311 | 437         |               |    |    |    |    |      |       |             |      | 437       |          |  | J. Fry's "Lion"               |
| 1,302        | 5 Sept., 1895 | 79A . . . . .                    |       | 200         |               |    |    |    |    | 200  |       |             |      |           |          |  |                               |
| 1,303        | 10 " 1895     | 118 . . . . .                    |       | 400         |               |    |    |    |    |      |       |             |      | 400       |          |  | North's "Condor"              |
| 1,308        | 18 " 1895     | 118 . . . . .                    |       | 400         |               |    |    |    |    |      |       |             |      | 400       |          |  |                               |
| 1,309        | 20 " 1895     | 118 . . . . .                    | 700   | 233         |               |    |    |    |    |      |       |             |      | 233       |          |  | J. Fry's "Lion."              |
| 1,312        | 24 " 1895     | 118 . . . . .                    |       | 500         |               |    |    |    |    |      |       |             |      | 500       |          |  | J. H. Hagenah's "Crown"       |
| 1,317        | 27 " 1895     | 118 . . . . .                    |       | 2,000       |               |    |    |    |    |      |       |             |      | 2,000     |          |  | H. Manske & Co.'s "Germania." |
| 1,329        | 15 Oct., 1895 | 77 . . . . .                     |       | 500 or 700. |               |    |    |    |    |      |       | 500 or 700. |      |           |          |  | J. H. Hagenah's "Crown."      |
| 1,330        | 19 " 1895     | 77 . . . . .                     |       | 500 or 600. |               |    |    |    |    |      |       | 500 or 600. |      |           |          |  | H. Manske & Co.'s "Germania." |
| 1,333        | 17 " 1895     | Johnstone's Creek, 118 Rejected. | 1,360 | 453         |               |    |    |    |    |      |       |             |      |           |          |  | J. Fry's "Lion"               |
| 1,346        | 21 Nov., 1895 | No 118                           |       | 1,200       |               |    |    |    |    |      |       |             |      | 1,200     |          |  | Josson & Co.'s "Tripod"       |
| 1,355        | 5 Dec., 1895  | 118. Rejected.                   | 1,360 | 453         |               |    |    |    |    |      |       |             |      |           |          |  | J. Fry's "Lion."              |
| 1,363        | 6 Jan., 1896  | 118                              |       | 1,200       |               |    |    |    |    |      |       |             |      | 1,200     |          |  | Josson & Co.'s "Tripod."      |
| 1,364        | 9 " 1896      | 118? Rejected.                   | 2,000 |             |               |    |    |    |    |      |       |             |      |           |          |  | J. Fry's "Lion."              |
| 1,378        | 12 Feb., 1896 | 118.                             | 1,500 | 500         |               |    |    |    |    |      |       |             |      |           |          |  |                               |
| 1,424        | 28 July, 1896 | Johnstone's Creek.               |       | 600         |               |    |    |    |    |      |       |             |      |           |          |  | Lion & Co.'s "Eiffel Tower."  |

(1,364 tested for Carter, G. & Co., contract not stated)

Appendix No. 39.

CONTRACT 79.

COST of Material and Cartage in connection with repairs to Culvert at Bondi. (See Parliamentary papers, page 321.)

| 1893.    |                           | £                 | s.  | d. |   |
|----------|---------------------------|-------------------|-----|----|---|
| 4 July   | ... Single teams to Bondi | 1 day at 20s.     | 1   | 0  | 0 |
|          | Freight                   |                   | 0   | 1  | 6 |
| 7 Aug.   | ... Single team, Bondi    | 1 day at 20s.     | 1   | 0  | 0 |
|          | Extra horse               | 1 " " 10s.        | 0   | 10 | 0 |
|          | Freight                   |                   | 0   | 3  | 0 |
|          | Cement                    | 5 barrels at 16s. | 4   | 0  | 0 |
| 26 "     | ... Single team, Bondi    | 1 day             | 1   | 0  | 0 |
|          | Cement                    | 2 barrels         | 1   | 12 | 0 |
|          | Freight                   |                   | 0   | 1  | 6 |
| 14 Sept. | ... Single team, Bondi    | 1 day             | 1   | 0  | 0 |
|          | Extra horse               | 1 " "             | 0   | 10 | 0 |
|          | Freight                   |                   | 0   | 3  | 0 |
|          |                           |                   | £11 | 1  | 0 |

Appendix No. 40.

MONIER CULVERT, BURWOOD.

Analysis of W. A. Smith's Statement re Expenditure.

| Voucher No.                   | Description   | £  | s. | d.   |
|-------------------------------|---|----|----|------|
| 389                           | Mr. Smith is quite in error in stating that fourteen casks of cement charged were not used, the fact being that none, or but very little, was left over, as can be shown from the fact that a fresh supply was needed and obtained for the next work  | 9  | 9  | 0    |
| 275 & 354                     | Bramston had but little else to attend to while this work was in progress; therefore the whole of two months' pay was rightly charged to this work. Deduction wrongly claimed by Mr. Smith  | 25 | 16 | 0    |
| 414                           | The previous wages voucher dated July 28th: Thus to August 2nd occurs an interval of four work days; five men's wages for this time amounts to  | 7  | 4  | 0    |
| 201                           | Bolts were not used in the culvert, but in making the centres, &c.  | 0  | 10 | 5    |
| 327                           | The whole this was for repair of tools used upon the work.  | 0  | 8  | 3    |
| 467, 8, 9                     | The Water and Sewerage Board's charges for removal of main, &c., were consequent upon this (more than necessarily) large culvert being put in   | 12 | 5  | 9    |
| Monier Culvert—Wages Account. |   |    |    |      |
| 189                           | This is a correct charge; <i>Isles</i> did not do all the carting for culvert, but merely the cartage of plant to the work. W. Thompson (the road carter) did more of it, such as carting gravel and sand from railway, metal to make good the roadway, spoil from excavation, removal of plant, &c. No record was kept of this; but the whole of this would probably amount to twelve days for one man, horse, and cart, 10s.  | 6  | 0  | 0    |
| 190, 224, 270, 363, 414.      | The whole of these wages (or, approximately the whole) had to do, either directly or incidentally, with the construction of this culvert, and consequently are a correct charge against it. The division of time I look upon as fictitious, <i>i.e.</i> , the old rotten brick structure was scarcely any hindrance to excavating trench for the men. And the cutting of outlet drain is mentioned; whereas this item of work was done prior to the work on the culvert being commenced, and is not charged against it. |    |    |      |
| 220                           | This item had to do with preparing centre, &c., for the culvert. Mr. Smith's statement as to the man Davis (or Davison) is incomprehensible. The man's time (49½ days) I believe to be correct. He was on the work till nearly the finish, and certainly did not go to gas-works bridge until September. Deductions incorrectly claimed by Mr. Smith on above items   | 48 | 2  | 0    |
|                               |   |    |    | L1st |

List of Vouchers paid from Parramatta District Votes for Wages and other matters not applying to the District.

| Voucher No |   | £  | s  | d. |
|------------|---|----|----|----|
| 475-92     | Brown and others, working on Sydney District, but charged to Main Windsor Road    | 42 | 13 | 6  |
| 498-92     | W A Smith   | 2  | 0  | 0  |
| 925-92     | Wells and others, working on Metropolitan District, charged to Main Southern Road | 55 | 11 | 6  |
| 18-93      | W A. Smith, £39 5s 9d, q  |    |    |    |
| 430-93     | W A Smith, V £5, of which only £1 applies   | 4  | 0  | 0  |
| 277-93     | W. Larkin (Main Southern Road)  | 18 | 15 | 0  |
| 418-93     | Larkin and another (Main Southern Road)   | 32 | 10 | 0  |
| 518-93     | P Wells   | 13 | 0  | 0  |
| 551-93     | W. A. Smith, V £6 18s 8d charged to district, one item only applying              | 5  | 14 | 6  |
| 298-94     | W A Smith, V £12 0s 11d charged, one item only applying                           | 11 | 0  | 11 |
| 419-94     | W A. Smith, V £9 14s 5d charged, one item only applying                           | 9  | 4  | 5  |

JAMES SYMONDS.

### Appendix No. 41.

Sydney, N S W., Pyrmont, 30 September, 1895

MESSRS. CARTER, GUMMOW, & Co bought of Francis Guy, Pyrmont Wharf and Timber Yard, Blackwattle Bay

| September | To  | 8 pieces | 9 x 1½  | hardwood— | 190 2           | s  | d. | £  | s    | d. |   |
|-----------|-----|----------|---------|-----------|-----------------|----|----|----|------|----|---|
|           | 22  | "        | 10 x 1½ | "         | 572 6-762 8     | 9  | 0  | 3  | 8    | 8  |   |
|           | 17  | "        | 10 x 1½ | "         | 395             |    |    |    |      |    |   |
|           | 30  | "        | 9 x 1½  | "         | 500 8-895 8     | 9  | 0  | 4  | 0    | 8  |   |
|           | 15  | "        | 3 x 2   | Oregon—   | 145 6           | 11 | 0  | 0  | 16   | 0  |   |
|           | 106 | "        | 3 x 2   | hardwood— | 816             | 9  | 0  | 3  | 13   | 5  |   |
|           | 44  | "        | 10 x 1½ | "         | 1,152 6         | 9  | 0  | 5  | 3    | 9  |   |
|           | 21  | "        | 12 x 1½ | Oregon—   | 867             |    |    |    |      |    |   |
|           | 16  | "        | 5 x 2   | "         | 318 4-1,185 4   | 11 | 0  | 6  | 10   | 5  |   |
|           | 40  | "        | 3 x 1   | "         | 182 6           |    |    | 1  | 1    | 11 |   |
|           | 15  | "        | 4 x 2½  | hardwood— | 262 6           |    |    |    |      |    |   |
|           | 20  | "        | 3 x 2   | "         | 160             |    |    |    |      |    |   |
|           | 20  | "        | 9 x 1½  | "         | 292 6           |    |    |    |      |    |   |
|           | 15  | "        | 10 x 1½ | "         | 432 6           |    |    |    |      |    |   |
|           | 27  | "        | 9 x 1½  | "         | 571 6-1,719     | 9  | 0  | 7  | 14   | 9  |   |
|           | 62  | "        | 10 x 1½ | "         | 1,558 4         |    |    |    |      |    |   |
|           | 57  | "        | 9 x 1½  | "         | 1,146 6-2,705 3 | 9  | 0  | 12 | 3    | 6  |   |
|           | 24  | "        | 10 x 1½ | "         | 615             |    |    |    |      |    |   |
|           | 21  | "        | 9 x 1½  | "         | 407 3-1,022 3   | 9  | 0  | 4  | 12   | 0  |   |
|           | 71  | "        | 3 x 1   | Oregon—   | 285 3           | 11 | 0  | 1  | 11   | 5  |   |
|           | 12  | "        | 10 x 1½ | hardwood— | 262 6           |    |    |    |      |    |   |
|           | 12  | "        | 9 x 1½  | "         | 226 2-488 8     | 9  | 0  | 2  | 4    | 0  |   |
|           | 36  | "        | 10 x 1½ | "         | 788 9           | 9  | 0  | 3  | 11   | 0  |   |
|           | 28  | "        | 3 x 1   | Oregon—   | 136             |    |    |    |      |    |   |
|           | 6   | "        | 5 x 2   | "         | 118 4 254 4     | 11 | 0  | 1  | 7    | 11 |   |
|           | 42  | "        | 10 x 1½ | hardwood— | 915             |    |    |    |      |    |   |
|           | 3   | "        | 9 x 1½  | "         | 90-1,005        | 9  | 0  | 4  | 10   | 5  |   |
|           | 70  | "        | 3 x 2   | "         | 854 6           |    |    |    |      |    |   |
|           | 30  | "        | 4 x 2½  | "         | 568 4-1,422 10  | 9  | 0  | 6  | 8    | 1  |   |
|           | 29  | "        | 4 x 2   | Oregon—   | 289 4           |    |    |    |      |    |   |
|           | 26  | "        | 4 x 1½  | "         | 255 6           |    |    |    |      |    |   |
|           | 24  | "        | 12 x 1½ | "         | 1,014           |    |    |    |      |    |   |
|           | 10  | "        | 12 x 1  | "         | 208-1,766 10    | 11 | 0  | 9  | 14   | 5  |   |
|           | 8   | "        | 12 x 1  | "         | 208             |    |    |    |      |    |   |
|           | 26  | "        | 12 x 1½ | "         | 1,035           |    |    |    |      |    |   |
|           | 12  | "        | 10 x 1½ | "         | 271 3           |    |    |    |      |    |   |
|           | 24  | "        | 3 x 1   | "         | 186-1,700 3     | 11 | 0  | 9  | 7    | 0  |   |
|           | 243 | "        | 3 x 2   | hardwood— | 1,992           |    |    |    |      |    |   |
|           | 63  | "        | 4 x 2½  | "         | 1,043 4         |    |    |    |      |    |   |
|           | 16  | "        | 10 x 1½ | "         | 392 6-3,427 10  | 9  | 0  | 15 | 8    | 6  |   |
|           | 36  | "        | 9 x 1½  | "         | 789 9           | 9  | 0  | 3  | 11   | 1  |   |
|           | 5   | "        | 4 x 2   | Oregon—   | 41 4            |    |    |    |      |    |   |
|           | 50  | "        | 3 x 1   | "         | 253-294 4       | 11 | 0  | 1  | 12   | 4  |   |
|           | 9   | "        | 12 x 1  | Col pine— | 102             | 15 | 0  | 0  | 15   | 4  |   |
|           | 38  | "        | 9 x 1½  | hardwood— | 927             | 9  | 0  | 4  | 3    | 5  |   |
|           | 7   | "        | 12 x 6  | "         | 1,032           | 10 | 6  | 5  | 8    | 5  |   |
|           | 19  | "        | 12 x 6  | "         | 2,634           | 10 | 6  | 13 | 16   | 7  |   |
|           |     |          |         |           |                 |    |    |    | £132 | 15 | 0 |

### Appendix No. 42.

Estimate of the value of work to be performed

Contract No. 77 —Johnstone's Creek and White's Creek Aqueduct, above Footings

| Description of Work           | Unit        | Probable Quantity | Rate | £     | s.     | d.   |
|-------------------------------|-------------|-------------------|------|-------|--------|------|
| Brickwork                     | cubic yard  | 1,935             | 2/10 | 4,837 | 10     | 0    |
| Tarred metal decking          | "           | 95                | 2/8  | 228   | 0      | 0    |
| Special bluestone concrete    | "           | 1,000             | 3/   | 3,000 | 0      | 0    |
| Sandstone concrete            | "           | 1,260             | 1/8- | 1,764 | 0      | 0    |
| Sand filling between parapets | "           | 130               | 1/   | 6     | 10     | 0    |
| Pyrmont ashlars               | cubic foot  | 13,250            | 3/6  | 2,318 | 15     | 0    |
| Cement facing                 | square yard | 2,750             | 2/6  | 342   | 15     | 0    |
| Slate covers                  | each        | 40                | 2/   | 4     | 0      | 0    |
|                               |             |                   |      | £     | 12,501 | 10 0 |









## Appendix No. 44.

## SUB-DUCTS.

104. Sub-ducts to be constructed, when decided on, along lines of tunnels and open trenches commencing on each length midway, or thereabouts, between two working shafts or faces, 33 inches below invert of main sewer, branches, &c., or as shall be directed at the time, and having a fall towards each working shaft or face of such gradients as may be determined at the time, after the thickness of sewer-lining required for each length between shafts or faces has been ascertained and ordered. Sub ducts of 9 inches, or of a greater or less internal diameter, if directed, to be laid immediately underneath the timber floor of tunnel or open trench, or at sides of sewer, in hardwood boxes varying in size and dimensions as shown on drawing. Said boxes to be laid straight and true to levels decided upon, and the pipes to be laid therein, upon, and surrounded by sandstone chippings and quarry refuse. Dry stone packing to be put over pipes, as specified in clause 21.

105. In solid and disintegrated rock the excavation for sub-duct to be executed as shown on cross-sections, and as shall be directed, and the sub-duct to consist of glazed stoneware spigot and faucet pipes of 9 inches internal diameter, more or less, as the case may be. The pipes to be jointed dry, and the filling above same, up to underside of sewer lining, to be of dry stone, hand-packed, as above described. The Engineer may also, if he deems it necessary, order the pipes to be jointed altogether, or in part with tarred gasket, 1½ inch deep, and cement mortar, 1¼ inch deep. The mortar to be prepared of one part cement to two parts of sand.

|    |   |               |     |     |
|----|---|---------------|-----|-----|
| 23 | Sub-duct in hard rock, with tile covers, as specified in clause 8   | lineal yard . | 5/- | 280 |
|    | Sub-duct, as specified in clause 8, in "more or less hard material," including dry or cement jointing for stoneware pipes :—                                |               |     |     |
| 24 | Of 6 in. internal diameter . . . . .  | "             | 4/- | 640 |
| 25 | Of 9 in. internal diameter . . . . .  | "             | 6/- | 640 |
|    | Sub-duct in water-charged loose ground, as specified in clause 8, including hardwood boxes with packing in same, and dry or cement jointing for pipes of :— |               |     |     |
| 26 | 6 in. internal diameter . . . . .   | "             | 7/- | 280 |
| 27 | 9 in. internal diameter . . . . .   | "             | 8/- | 280 |

## Appendix No. 45.

## FINAL CERTIFICATE.

Contract No. 79.—Final Return showing quantity and value of Work executed or fixed on the 10th day of October, 1894.

| Schedule Rate No | Description.                             | Unit.       | Quantity | Rate | Amount.     | Total.      |
|------------------|--|-------------|----------|------|-------------|-------------|
|                  |  |             |          |      | £ s. d.     | £ s. d.     |
| 1                | Excavation in tunnels, gadding . . . . . | cubic yard  | 21.22    | 63/- | 68 16 10    |             |
| 3                | " " 2 in. powder . . . . .               | "           | 3,707.52 | 60/- | 11,122 11 2 |             |
| 4                | " " 4 in. " . . . . .                    | "           | 541.77   | 78/- | 2,112 18 1  |             |
| 7                | " shafts, 4 in. " . . . . .              | "           | 3,267.97 | 78/- | 12,745 1 8  |             |
| 8                | Filling in . . . . .                     | "           | 431.80   | 1/-  | 21 11 10    |             |
| 17               | Sandstone concrete . . . . .             | "           | 1,872.17 | 37/6 | 3,510 6 4   |             |
| 18               | Bluestone " . . . . .                    | "           | 1,562.52 | 56/- | 4,375 1 1   |             |
| 19               | Brickwork . . . . .                      | "           | 521.81   | 50/- | 1,304 10 6  |             |
| 21               | Cement facing . . . . .                  | square yard | 8,779.12 | 2/-  | 877 18 3    |             |
| 22               | Bluestone concrete . . . . .             | cubic yard  | 161.00   | 60/- | 483 0 0     |             |
| 23               | Brickwork . . . . .                      | "           | 862.99   | 65/- | 2,504 14 4  |             |
| 24               | Cement facing . . . . .                  | square yard | 255.06   | 2/-  | 25 10 1     |             |
| 25               | Sandstone ashlar . . . . .               | cubic foot  | 170.97   | 6/-  | 51 5 10     |             |
| 26               | Bluestone pitchers . . . . .             | square yard | 16.77    | 30/- | 25 3 1      |             |
| 27               | 18-in. E.W. pipes . . . . .              | lineal foot | 3.00     | 10/- | 1 10 0      |             |
| 28               | 9-in. " " . . . . .                      | "           | 31.00    | 2/-  | 3 2 0       |             |
| 29               | Surplus material . . . . .               | cubic yard  | 7,006.68 | 1/-  | 350 6 8     |             |
| 31               | Fixing ironwork . . . . .                | ton         | 29.16    | 60/- | 87 9 7      |             |
| 32               | Closing branch sewers . . . . .          | each        | 7        | 10/- | 3 10 0      |             |
| 33               | Trapped junction blocks . . . . .        | "           | 4        | 5/-  | 1 0 0       |             |
| 43               | Portland cement . . . . .                | cask        | 7        | 16/- | 5 12 0      |             |
| 44               | Mechanic . . . . .                       | day         | 3½       | 12/- | 2 6 6       |             |
| 46               | Ordinary labourer . . . . .              | "           | 13       | 10/- | 6 10 0      |             |
| 47               | Cart, horse, and driver . . . . .        | "           | 8        | 20/- | 8 0 0       |             |
| 48               | Additional horse . . . . .               | "           | 3½       | 10/- | 1 15 0      |             |
| 49               | Three months' maintenance . . . . .      | lump sum    | ...      | ...  | 21 18 2     |             |
| ...              | Galvanised sheet iron . . . . .          | sheet       | 1        | 6/-  | 0 6 0       |             |
| ...              | Castings . . . . .                       | cwt.        | 1¼       | 25/- | 1 11 3      |             |
| ...              | 6-in. vent pipes . . . . .               | lineal foot | 44.00    | 1/-  | 2 4 0       |             |
|                  |  |             |          |      |             | 40,023 10 3 |

## Appendix No. 46.

Estimate for Aqueducts, Contract No. 77, Departmental plans upon the rearranged quantities.

|        |  |      |  |           |             |
|--------|--|------|--|-----------|-------------|
| 1484   | Cubic yards sandstone concrete . . . . .               |      |  | £ s. d.   | £ s. d.     |
| 1054   | " special bluestone concrete . . . . .                 | 50/- |  | 2,635 0 0 |             |
| 1859   | " brickwork . . . . .                                  | 40/- |  | 3,718 0 0 |             |
| 12190  | Cubic feet molded freestone . . . . .                  | 3/6  |  | 2,133 5 0 |             |
| 2682   | Super. yards ½ inch cement rendering, 1 to 1 . . . . . | 2/-  |  | 268 4 0   |             |
| 608    | " " 1 to 2 . . . . .                                   | 1/9  |  | 53 4 0    |             |
| 92     | Cubic yards tarred metal . . . . .                     | 30/- |  | 138 0 0   |             |
| No. 40 | Super. slates . . . . .                                | 3/-  |  | 6 0 0     |             |
| 170    | Feet lineal 4 inch scupper pipes . . . . .             | 2/-  |  | 17 0 0    |             |
| 70     | Cwt. fixing only iron . . . . .                        | 5/-  |  | 17 10 0   |             |
|        |  |      |  |           | 11,203 14 0 |

Estimate for Monier Aqueducts in Contract No. 77, based upon quantities as rearranged, and according to the work as being executed.

|        |   | £    | s. | d. | £          | s. | d. |
|--------|---|------|----|----|------------|----|----|
| 1,533  | Cubic yards material above skewbacks, comprising— |      |    |    |            |    |    |
|        | 383 cubic yards compo. ....                       |      |    |    | 4,330      | 0  | 0  |
|        | 1150 " small bluestone concrete .....             |      |    |    |            |    |    |
|        | 37 tons of iron in grills.....                    |      |    |    |            |    |    |
| 18½    | Tons channel iron and tie-bars fixed.....         | £15  |    |    | 270        | 3  | 0  |
| 15¾    | " cast-iron cover plates fixed .....              | £14  |    |    | 220        | 10 | 0  |
| 10,625 | Super. yards cement rendering, 1 to 1 .....       | 2/-  |    |    | 1,062      | 10 | 0  |
| 1,016  | " " " 1 to 2 .....                                | 1/9  |    |    | 88         | 18 | 0  |
| 1,350  | Cubic yards sandstone concrete .....              | 24/- |    |    | 1,620      | 0  | 0  |
| 158¾   | " bluestone concrete in skewbacks.....            | 50/- |    |    | 396        | 13 | 4  |
|        |   |      |    |    | 7,988 14 4 |    |    |

|                                |  | £                  | s. | d. |
|--------------------------------|--|--------------------|----|----|
| Brick departmental plans ..... |  | 11,203             | 14 | 0  |
| Monier plan .....              |  | 7,988              | 14 | 4  |
|                                |  | <u>£3,214 19 8</u> |    |    |

JOHN YOUNG.

Appendix No. 47.

CONTRACT No. 79.—Schedule of quantities and prices for constructing and completing 1 mile 25·3 chains, more or less, of the main outfall sewer, North Shore, branch and pipe sewers, shafts, junctions, &c., subject to omissions, extras, extensions, additions, enlargements, deviations, or alterations, as provided by the conditions of contract.

The quantities in this schedule are not guaranteed as correct, but are merely given for the guidance of intending contractors, this being a schedule of Prices Contract.

| No. of Item. | Description of Work.  | Unit.       | Probable Quantity. | Rate. | Amount.    |
|--------------|---|-------------|--------------------|-------|------------|
|              | Excavation in tunnels, in hard rock, for sewer, branches, pipe-sewers, junctions, curves, &c., as specified in clauses 38, 42, 45, 48 to 68, including subducts, timbering, unwatering, and removing the excavated materials beyond actual site of works, as viz. :—                            |             |                    |       | £ s. d.    |
| 1            | Excavation in hard rock, where gadding only is permitted .....  | cubic yard  | 800                | 63/-  | 2,520 0 0  |
| 2            | Excavation in hard rock, where charges of powder 2 inches in length by 1½ inch in diameter, and such depths of boreholes as shall be directed only are permitted .....  | "           | 835                | 61/-  | 2,546 15 0 |
| 3            | Excavation in hard rock, where charges of powder 4 inches in length by 1½ inch in diameter, and such depths of boreholes as shall be directed only are permitted .....  | "           | 3,000              | 60/-  | 9,000 0 0  |
|              | Excavation in shafts, shaft-chambers, and sumps, as specified in clauses 39, 52, 53, 71, and 72, including timbering, unwatering, and removing the excavated materials beyond actual site of works, as viz. :—  |             |                    |       |            |
| 4            | Excavation in road surfaces, sand, soil, clay, pipeclay, shale, and soft rock only .....  | "           | 75                 | 78/-  | 292 10 0   |
| 5            | Excavation in hard rock, where gadding only is permitted .....  | "           | 361                | 83/-  | 1,498 3 0  |
| 6            | Excavation in hard rock, where charges of powder 2 inches in length by 1½ inch in diameter, and such depths of boreholes as shall be directed only are permitted .....  | "           | 500                | 79/-  | 1,975 0 0  |
| 7            | Excavation in hard rock, where charges of powder 4 inches in length by 1½ inch in diameter, and such depths of boreholes as shall be directed only are permitted .....  | "           | 2,500              | 78/-  | 9,750 0 0  |
| 8            | Filling in round brick and concrete work of ventilating and intercepting shafts and chambers, manholes, and into all shafts, as specified in clauses 40, 41, 42, 43, 71, and 72, including withdrawing of timber, depositing in layers, replacing road and other surfaces, ramming, &c. ....    | "           | 120                | 1/-   | 6 0 0      |
| 9            | Timber ordered in writing to be left in tunnels, shafts, as specified in clauses 36 and 37, including all iron used in fixing same .....  | cubic feet  | 500                | -/1   | 2 1 8      |
| 10           | Subduct in hard rock, with tile covers, as specified in clauses 76 and 77 .....   | lineal yard | 250                | -/1   | 1 0 10     |
|              | Subduct, as specified in clauses 76 and 78, in more or less hard material, including dry or cement jointing for stoneware pipes, &c. :—   |             |                    |       |            |
| 11           | Of 6 inches internal diameter .....   | "           | 100                | -/1   | 0 8 4      |
| 12           | Of 9 " " " .....  | "           | 100                | -/1   | 0 8 4      |
|              | Subduct in water-charged loose ground, as specified in clause 76, including hardwood boxes with packing in same, and dry or cement jointing for pipes of :—   |             |                    |       |            |
| 13           | 6 inches internal diameter .....  | "           | 100                | -/1   | 0 8 4      |
| 14           | 9 " " " .....   | "           | 100                | -/1   | 0 8 4      |
| 15           | 10 " " " .....  | "           | 100                | -/1   | 0 8 4      |
| 16           | Hand-packed stone-filling, 4-inch gauge, as specified in clauses 17, 69, 76 to 78, over subducts, and when ordered, round sewers, and pipe-sewers in tunnels, including depositing, packing, and ramming .....  | cubic yard  | 300                | -/1   | 1 5 0      |
| 17           | Sandstone concrete, any shape, form, or thickness, in shafts, tunnels, sumps, round stoneware pipes, and, where ordered, in any situation in the construction of these works, as specified in clauses 26, 27, 93 to 109, including washing, dry surfaces, wetting, and grouting, complete ..... | "           | 1,020              | 37/6  | 1,912 10 0 |
| 18           | Bluestone concrete, any shape, form, thickness, arched, circular, or otherwise, in sewer, curved junctions, arches, manholes, &c., as specified in clauses 24, 27, 93 to 109, including washing dry surfaces, wetting, and grouting, complete.....  | "           | 1,390              | 56/-  | 3,892 0 0  |

| No. of Item | Description of Work.   | Unit.       | Probable Quantity. | Rate. | Amount.    |
|-------------|--|-------------|--------------------|-------|------------|
|             |  |             |                    |       | £ s. d.    |
| 19          | Brickwork in cement in sewer, junctions, shaft-chambers circular, curved, arched, or otherwise, any shape or form or thickness, as specified in clauses 110 to 113, including wetting, flushing, grouting, collar-joints, pointing, where ordered, &c. :—  | cubic yard  | 520                | 50/-  | 1,300 0 0  |
| 20          | Of one ring or portion of a ring .....   | "           | 180                | 20/-  | 180 0 0    |
| 21          | Cement facing in two thicknesses, $\frac{3}{8}$ inch thick when finished, as specified in clause 114, to all internal (and external, where ordered) surfaces of sewer, junctions, shaft-chambers, culverts, manholes, and where ordered in any situation in the construction of these works .....  | square yd.  | 8,900              | 2/-   | 890 0 0    |
| 22          | Bluestone concrete, any shape, form, or thickness, arched, circular, or otherwise, in shafts, over shaft-chambers, as specified in clauses 93 to 109, including washing dry surfaces, wetting and grouting, complete .....   | cubic yard  | 150                | 60/-  | 450 0 0    |
| 23          | Brickwork in cement, circular, arched, curved, or otherwise, any shape, form, or thickness, as specified in clauses 110 to 113, in shafts, over shaft-chambers, including wetting, flushing, grouting, pointing, where ordered, collar-joints, &c., complete .....   | "           | 870                | 65/-  | 2,827 10 0 |
| 24          | Cement facing in two thicknesses, $\frac{3}{8}$ inch thick when finished, to all internal and external surfaces of shafts, where ordered, as specified in clause 114 .....   | square yd.  | 290                | 2/-   | 29 0 0     |
| 25          | Pyrmont sandstone, ashlar, set in cement, on top of ventilating shafts, and where ordered, as specified in clauses 16 and 115, complete .....  | cubic feet  | 185                | 6/-   | 55 10 0    |
| 26          | Squared bluestone pitchers, 9 inches deep, set in sand, round cast-iron ventilating grates of shafts, where ordered, as specified in clause 116, complete .....  | square yd.  | 20                 | 30/-  | 30 0 0     |
| 27          | Providing, laying, and jointing glazed stoneware, plain pipes, in trenches, and where ordered, including fixing discs, as specified, and including bed joints, in mortar, where required :—  | lineal feet | 2                  | 10/-  | 1 0 0      |
| 28          | 18 inches diameter .....   | "           | 60                 | 2/-   | 6 0 0      |
|             | 9 " " .....  | "           |                    |       |            |
|             | <b>SURPLUS MATERIALS.</b>  |             |                    |       |            |
|             | Removal of surplus materials from the various excavations throughout this contract, as tunnels and open trenches, including sub-ducts, shafts, sumps, &c., as specified in clauses 40, 42, 43, and 45, as viz. :—  |             |                    |       |            |
| 29          | For the first half mile of lead .....  | cubic yard  | 7,960              | 1/-   | 398 0 0    |
| 30          | For every further quarter of a mile of lead .....  | "           | 15,920             | -/1   | 66 6 8     |
|             | <b>GOVERNMENT PROPERTY.</b>  |             |                    |       |            |
| 31          | Placing, building in, fixing, and jointing only, any metal work, as cast-iron oval and circular pipes, junctions, branches, flanged, and with spigot and faucet ends, gas-checks, ventilating grates, lamp-hole boxes, man-hole covers, staples, step-irons, earthenware covers, &c., supplied by the Government, including carriage, as specified in clauses 91, 121, 131 to 133 complete ..... | ton         | 40                 | 60/-  | 120 0 0    |
| 32          | Closing of branch sewers and intercepting pipes with earthenware or cast-iron covers, set in cement, labour only, as specified in clause 131 complete .....  | each        | 30                 | 10/-  | 15 0 0     |
| 33          | Trapped junction blocks, taking delivery of, and building in .....   | "           | 10                 | 5/-   | 2 10 0     |
|             | <b>GENERAL.</b>  |             |                    |       |            |
| 34          | Permanent puddle where ordered, in any situation, in the construction of these works (temporary puddle ordered for purposes of execution of work not to be paid for), as specified in clause 29, including spreading in 9-inch layers, and ramming, complete .....   | cubic yard  | 20                 | 2/-   | 2 0 0      |
| 35          | Special bluestone concrete, as specified in clause 25, where ordered in any situation, in the construction of the works .....  | "           | 10                 | 6/-   | 3 0 0      |
| 36          | Bluestone metal (clause 18), 1 $\frac{1}{2}$ -inch gauge, stacked .....  | "           | 10                 | 15/-  | 7 10 0     |
| 37          | Sandstone metal (clause 26), 2 $\frac{1}{2}$ -inch gauge, stacked .....  | "           | 10                 | 2/6   | 1 5 0      |
| 38          | Bluestone metal (clause 32), 2 $\frac{1}{2}$ -inch gauge, stacked .....  | "           | 10                 | 15/-  | 7 10 0     |
| 39          | Sharp, clean washed sand (clause 19), stacked .....  | "           | 10                 | 5/-   | 2 10 0     |
| 40          | Sawn hardwood, in scantlings or planks (clause 30) .....   | cubic feet  | 50                 | 2/-   | 5 0 0      |
| 41          | Oregon timber, in scantlings or planks .....   | "           | 50                 | 2/6   | 6 5 0      |
| 42          | Wrought-iron in bolts, galvanised step-irons, screws, nails, spikes, straps, &c. (clause 31) .....   | cwt.        | 3                  | 56/-  | 8 8 0      |
| 43          | Portland cement .....  | cask        | 10                 | 16/-  | 8 0 0      |
| 44          | Artisan or mechanic, supplied by contractor .....  | day         | 15                 | 12/-  | 9 0 0      |
| 45          | Quarryman or other skilled labourer, supplied by contractor .....  | "           | 15                 | 10/-  | 7 10 0     |
| 46          | Ordinary labourer, supplied by contractor .....  | "           | 30                 | 10/-  | 15 0 0     |
| 47          | Cart, with one horse and driver, supplied by contractor .....  | "           | 10                 | 20/-  | 10 0 0     |
| 48          | One additional horse, supplied by contractor .....   | "           | 10                 | 10/-  | 5 0 0      |
|             | <b>MAINTENANCE.</b>  |             |                    |       |            |
| 49          | Three months' maintenance after formal delivery of works .....   | lump sum    | .....              | ...   | 21 18 2    |
|             | Total .....  | .....       | .....              | ...   | 39,890 0 0 |

This is the Schedule of Quantities and Prices referred to in our annexed agreement with Her Majesty the Queen, dated the 10th day of March, A.D. 1892.

Witness,—V. C. LUMSDAINE.

JOHN CARTER,  
D. G. SNODGRASS.

Appendix No. 48.

CONTRACT No. 69.—Return showing the relative amounts of the various tenders received based upon the quantities actually paid for. (Note—The first money columns represent the values where the schedule quantities have been exceeded, the second where they have been reduced, and the third where no appreciable difference in quantity has been made.)

| Item.    | Description                  | Estimated Quantity         | Quantity paid for. | Messrs Carter, Gummow, & Co. |               |            | Mr John Ahern. |      |            |            | Messrs Keble & Keble |         |             |            |             |
|----------|------------------------------|----------------------------|--------------------|------------------------------|---------------|------------|----------------|------|------------|------------|----------------------|---------|-------------|------------|-------------|
|          |                              |                            |                    | Rate                         | Amount        | Amount     | Amount         | Rate | Amount     | Amount     | Amount               | Rate    | Amount      | Amount     | Amount      |
| 1        | Excavation, open trench      | 19,320 yards cub           | 19,230 yards cub.  | 9d                           | £ s d         | £ s d      | £ s d          | 2/-  | £ s d      | £ s d      | £ s d                | 2-      | £ s d       | £ s d      | £ s d.      |
| 8        | " tunnel (more or less hard) | 1,140 " "                  | 7,661 " "          | 27/6                         | 10,533 17 6   |            |                | 16-  | 6,128 16 0 | 1,923 0 0  |                      | 23/-    | 8,810 3 0   | 1,923 0 0  |             |
| 11       | " " solid rock               | 1,850 " "                  | 6,712 " "          |                              | 9,229 0 0     |            |                | 19/- | 6,376 8 0  |            |                      | 35/-    | 11,746 0 0  |            |             |
| 12       | " shafts, soft               | 130 " "                    | 91 " "             | 4/-                          |               | 18 4 0     |                |      |            | 45 10 0    |                      | 4/-     |             | 18 4 0     |             |
| 14       | " " hard                     | 445 " "                    | 404 " "            | 4/-                          |               | 80 16 0    |                |      |            | 303 0 0    |                      | 20-     |             | 404 0 0    |             |
| 16       | " (more or less hard), soft  | 170 " "                    | 539 " "            | 40/-                         | 1,078 0 0     |            |                | 6/-  | 161 14 0   |            |                      | 4/-     | 107 16 0    |            |             |
| 19       | " ( " ), hard                | 115 " "                    | 84 " "             | 5/-                          |               | 21 0 0     |                | 18/- |            | 75 12 0    |                      | 15/-    |             | 63 0 0     |             |
| 20       | Filling                      | 15,220 " "                 | 17,200 " "         | 6d                           | 430 0 0       |            |                | 1/-  | 860 0 0    |            |                      | 1/-     | 1,720 0 0   |            |             |
| 21       | Timber left in               | 9,000 feet "               | 9,818 feet "       | 1d                           | 40 18 2       |            |                | 2-   | 981 16 0   |            |                      | 1d      | 40 18 2     |            |             |
| 22       | Removing culvert             | 244 yards "                | 74 yards "         | 2/6                          |               | 9 5 0      |                | 10/- |            | 37 0 0     |                      | 1/-     |             | 3 14 0     |             |
| 25       | Hand packed stone filling    | 760 " "                    | 329 " "            | 1/-                          |               | 16 9 0     |                | 3/-  |            | 49 7 0     |                      | 3/6     |             | 57 11 6    |             |
| 29       | Blue metal                   | 190 " "                    | 132 " "            | 10/-                         |               | 66 0 0     |                | 12/6 |            | 82 10 0    |                      | 16/-    |             | 105 12 0   |             |
| 30       | Blending                     | 90 " "                     | 66 " "             | 2/6                          |               | 8 5 0      |                | 1/-  |            | 3 6 0      |                      | 2-      |             | 6 12 0     |             |
| 31       | Sandstone concrete           | 1,050 " "                  | 1,731 " "          | 40-                          |               | 2,062 0 0  |                | 36-  |            | 1,855 16 0 |                      | 32-     |             | 1,649 12 0 |             |
| 32       | Bluestone "                  | 4,550 " "                  | 4,844 " "          | 43/-                         | 10,414 12 0   |            |                | 42/- | 10,172 8 0 |            |                      | 50/-    | 12 110 0 0  |            |             |
| 33       | Brickwork                    | 1,605 " "                  | 1,912 " "          | 55/-                         | 5,282 15 0    |            |                | 55/- | 5,282 15 0 |            |                      | 55/-    | 5 282 15 0  |            |             |
| 34       | Cement facing                | 11,600 " sup               | 10,683 yards sup   | 5/-                          |               | 2,670 15 0 |                | 2 6  |            | 1,335 7 6  |                      | 3/-     |             | 1,602 9 0  |             |
| 35       | Sandstone ashlar             | 210 feet cub               | 60 feet cub        | 5/-                          |               | 15 0 0     |                | 5/-  |            | 15 0 0     |                      | 3-      |             | 9 0 0      |             |
| 36       | Bluestone pitchers           | 12 yards sup               | 30½ yards sup      | £50                          | 1,825 0 0     |            |                | 15/- | 27 7 6     |            |                      | £3      | 109 10 0    |            |             |
| 38       | Ordinance fencing            | 7 rods                     | 5 rods             | £4                           |               | 20 0 0     |                | 50/- |            | 12 10 0    |                      | 30/-    |             | 7 10 0     |             |
| 39       | 9' stoneware pipes           | 40 yards hml               | 32 yards hml.      | 2/-                          |               | 3 4 0      |                | 4/-  |            | 6 8 0      |                      | 5/-     |             | 8 0 0      |             |
| 40       | 12 " "                       | 64 " "                     | 31 " "             | 3/-                          |               | 4 13 0     |                | 5/-  |            | 7 15 0     |                      | 9 6     |             | 14 14 6    |             |
| 41       | 16' " "                      | 15 " "                     | 11 " "             | 6/-                          |               | 3 6 0      |                | 8/-  |            | 4 8 0      |                      | 15/-    |             | 8 5 0      |             |
| 42       | 18' " "                      | 5 " "                      | 2 " "              | 10/-                         |               | 1 0 0      |                | 12/- |            | 1 4 0      |                      | 23/-    |             | 2 6 0      |             |
| 43       | Surplus material             | 2,420 " cub.               | 17,671 yards cub   | 3d                           |               | 220 17 9   |                | 9d   |            | 662 13 3   |                      | 3d      |             | 220 17 9   |             |
| 45 to 82 | Ironwork                     | (From schedule quantities) |                    |                              |               |            | 8,909 5 6      |      |            |            | 10,041 11 3          |         |             |            | 9,840 1 9   |
| 83       | Laying, &c, 3' 9" pipes      | 396 yards hml              | 376 yards hml.     | 3/6                          |               | 65 16 0    |                | 20/- |            | 376 0 0    |                      | 15/-    |             | 207 0 0    |             |
| 84       | " 3' 6" "                    | 649 " "                    | 640 " "            | 3 6                          |               | 112 0 0    |                | 18/6 |            | 592 0 0    |                      | 13/-    |             | 416 0 0    |             |
| 85       | " 24" "                      | 246 " "                    | 244 " "            | 2/6                          |               | 30 10 0    |                | 6/-  |            | 73 4 0     |                      | 10/-    |             | 122 0 0    |             |
| 86       | Flap traps                   | 10 No                      | 30 No.             | 25/-                         | 37 10 0       |            |                | £5   | 150 0 0    |            |                      | 25/-    | 37 10 0     |            |             |
| 95       | Galvanised wrought iron      | 20 cwt                     | 19 cwt             | 50-                          |               | 47 10 0    |                | 40/- |            | 38 0 0     |                      | 30-     |             | 28 10 0    |             |
| 96       | Cement                       | 25 casks                   | 11 casks           | 12/-                         |               | 6 12 0     |                | 15/- |            | 8 5 0      |                      | 11/-    |             | 6 1 0      |             |
| 97       | Artizan                      | No quantity                | 47 days            | 16/-                         |               |            | 37 12 0        |      |            |            | 32 18 0              | 15/-    |             |            | 35 5 0      |
| 99       | Labourers                    | "                          | 119 "              | 11/-                         |               |            | 65 9 0         |      |            |            | 53 11 0              | 9/-     |             |            | 53 11 0     |
| 100      | Cart, horse, and driver      | "                          | 27 "               | £1                           |               |            | 37 0 0         |      |            |            | 20 5 0               | 12/-    |             |            | 16 4 0      |
|          | Out of schedule ..           | "                          | £205 3s. 2d.       |                              |               |            | 205 3 2        |      |            |            | 205 3 2              | 205/3/2 |             |            | 205 3 2     |
|          |                              |                            |                    |                              | £ 38,871 12 8 | 6,204 5 3  | 9,244 9 8      |      | 90,141 4 6 | 7,507 15 9 | 10,353 8 5           |         | 39,964 12 2 | 6,883 18 9 | 10,150 4 11 |

CONTRACT No. 69.—Return showing the relative amounts of the various tenders received based upon the quantities actually paid for—*continued.*

| Item.    | H. McKenzie & Sons. |            |             |             | J. McSweeney. |            |             |            | Holloway Bros. |             |           |             | J. F. Carson. |             |            |            | A. Dean & Sons. |            |            |             |  |
|----------|---------------------|------------|-------------|-------------|---------------|------------|-------------|------------|----------------|-------------|-----------|-------------|---------------|-------------|------------|------------|-----------------|------------|------------|-------------|--|
|          | Rate.               | Amount.    | Amount.     | Amount.     | Rate.         | Amount.    | Amount.     | Amount.    | Rate.          | Amount.     | Amount.   | Amount.     | Rate.         | Amount.     | Amount.    | Amount.    | Rate.           | Amount.    | Amount.    | Amount.     |  |
| 1        | 3/6                 | £ s. d.    | £ s. d.     | £ s. d.     | 3/9           | £ s. d.    | £ s. d.     | £ s. d.    | 1/6            | £ s. d.     | £ s. d.   | £ s. d.     | 3/-           | £ s. d.     | £ s. d.    | £ s. d.    | 3/-             | £ s. d.    | £ s. d.    | £ s. d.     |  |
| 8        | 13/6                | 5,171 3 6  | 3,365 5 6   | .           | 32/6          | 12,449 2 6 | 3,605 12 6  | .          | 20/-           | 7,661 0 0   | 1,442 5 0 | .           | 15/-          | 5,745 15 0  | 2,884 10 0 | ..         | 18/-            | 6,891 18 0 | 2,831 10 0 | .           |  |
| 11       | 18/-                | 6,040 16 0 | .           | ..          | 35/-          | 11,746 0 0 | .           | ..         | 25/-           | 8,390 0 0   | .         | ..          | 40/-          | 13,424 0 0  | .          | ..         | 25/-            | 8,390 0 0  | .          | ..          |  |
| 12       | 12/-                | .          | 54 10 0     | ..          | 12/-          | .          | 54 12 0     | ..         | 30/-           | .           | 136 10 0  | ..          | 10/-          | .           | 45 10 0    | ..         | 12/-            | .          | 54 12 0    | ..          |  |
| 14       | 22/6                | .          | 454 10 0    | ..          | 22/-          | .          | 444 4 0     | ..         | 27/6           | .           | 555 10 0  | ..          | 30/-          | .           | 606 0 0    | ..         | 20/-            | .          | 404 0 0    | ..          |  |
| 16       | 13/6                | 363 16 6   | ..          | ..          | 12/-          | 323 8 0    | .           | ..         | 30/-           | 808 10 0    | .         | ..          | 10/-          | 269 10 0    | .          | ..         | 12/-            | 323 8 0    | .          | ..          |  |
| 19       | 22/6                | .          | 94 10 0     | ..          | 22/-          | .          | 92 8 0      | ..         | 30/-           | .           | 126 0 0   | ..          | 20/-          | .           | 84 0 0     | ..         | 20/-            | .          | 84 0 0     | ..          |  |
| 20       | 2/6                 | 1,290 0 0  | .           | ..          | 1/6           | 1,290 0 0  | .           | ..         | 1/-            | 860 0 0     | ..        | ..          | 2/-           | 1,720 0 0   | .          | ..         | 1/3             | 1,075 0 0  | .          | ..          |  |
| 21       | 2/6                 | 1,227 5 0  | .           | ..          | 3d.           | 122 14 6   | .           | ..         | 5/-            | 2,454 10 0  | .         | ..          | 2/6           | 1,227 5 0   | .          | ..         | 6/-             | 2,945 8 0  | .          | ..          |  |
| 22       | 10/-                | .          | 37 0 0      | ..          | 5/-           | .          | 18 10 0     | ..         | 10/-           | .           | 37 0 0    | ..          | 2/-           | .           | 7 8 0      | ..         | 20/-            | .          | 74 0 0     | ..          |  |
| 28       | 5/-                 | .          | 82 5 0      | ..          | 4/-           | .          | 65 16 0     | ..         | 5/-            | .           | 82 5 0    | ..          | 5/-           | .           | 82 5 0     | ..         | 10/-            | .          | 164 10 0   | ..          |  |
| 29       | 14/-                | .          | 92 8 0      | ..          | 15/-          | .          | 99 0 0      | ..         | 16/-           | .           | 105 12 0  | ..          | 15/-          | .           | 99 0 0     | ..         | 18/-            | .          | 118 16 0   | ..          |  |
| 30       | 5/-                 | .          | 16 10 0     | ..          | 20/-          | .          | 66 0 0      | ..         | 10/-           | .           | 33 0 0    | ..          | 7/6           | .           | 25 5 0     | ..         | 6/-             | .          | 19 16 0    | ..          |  |
| 31       | 33/-                | .          | 1,701 3 0   | ..          | 33/-          | .          | 1,701 3 0   | ..         | 37/6           | .           | 1,933 2 6 | ..          | 40/-          | .           | 2,062 0 0  | ..         | 35/-            | .          | 1,801 5 0  | ..          |  |
| 32       | 46/-                | 11,141 4 0 | .           | ..          | 38/-          | 9,235 12 0 | .           | ..         | 42/6           | 10,293 10 0 | .         | ..          | 45/-          | 10,899 0 0  | .          | ..         | 50/-            | 12,110 0 0 | .          | ..          |  |
| 33       | 54/-                | 5,186 14 0 | .           | ..          | 49/-          | 4,706 9 0  | .           | ..         | 55/-           | 5,282 15 0  | .         | ..          | 50/-          | 4,802 10 0  | .          | ..         | 58/-            | 5,570 18 0 | .          | ..          |  |
| 34       | 3/-                 | .          | 1,602 9 0   | ..          | 1/6           | .          | 801 4 6     | ..         | 1/6            | .           | 801 4 6   | ..          | 1/6           | .           | 801 4 6    | ..         | 2/-             | .          | 1,068 6 0  | ..          |  |
| 35       | 3/-                 | .          | 9 0 0       | ..          | 4/-           | .          | 12 0 0      | ..         | 4/-            | .           | 12 0 0    | ..          | 4/-           | .           | 12 0 0     | ..         | 4/-             | .          | 12 0 0     | ..          |  |
| 36       | 20/-                | 36 10 0    | .           | ..          | 45/-          | 82 2 6     | .           | ..         | 30/-           | 54 15 0     | .         | ..          | 20/-          | 36 10 0     | .          | ..         | 30/-            | 54 15 0    | .          | ..          |  |
| 38       | 20/-                | ..         | 5 0 0       | ..          | 20/-          | .          | 5 0 0       | ..         | 60/-           | ..          | 15 0 0    | ..          | 23/-          | ..          | 5 0 0      | ..         | £3              | ..         | 15 0 0     | ..          |  |
| 39       | 6/-                 | ..         | 9 12 0      | ..          | 5/-           | ..         | 8 0 0       | ..         | 5/-            | ..          | 8 0 0     | ..          | 3/-           | ..          | 4 16 0     | ..         | 5/-             | ..         | 8 0 0      | ..          |  |
| 40       | 10/-                | ..         | 15 10 0     | ..          | 6/3           | ..         | 9 13 9      | ..         | 7/6            | ..          | 11 12 6   | ..          | 4/6           | ..          | 6 19 6     | ..         | 7/6             | ..         | 11 12 6    | ..          |  |
| 41       | 20/-                | ..         | 11 0 0      | ..          | 10/-          | ..         | 5 10 0      | ..         | 15/-           | ..          | 8 5 0     | ..          | 9/-           | ..          | 4 19 0     | ..         | 10/-            | ..         | 5 10 0     | ..          |  |
| 42       | 25/-                | ..         | 2 10 0      | ..          | 12/6          | ..         | 1 5 0       | ..         | 20/-           | ..          | 2 0 0     | ..          | 12/-          | ..          | 1 4 0      | ..         | 15/-            | ..         | 1 10 0     | ..          |  |
| 43       | 2/3                 | ..         | 1,104 8 9   | ..          | 9d.           | ..         | 662 13 3    | ..         | 1/-            | ..          | 883 11 0  | ..          | 6d.           | ..          | 441 15 6   | ..         | 1/3             | ..         | 1,101 8 9  | ..          |  |
| 45 to 82 |                     |            | 10,410 6 9  |             |               |            | 10,354 15 1 |            |                |             | 9,960 1 6 |             |               |             | 9,471 12 3 |            |                 |            |            | 10,549 10 8 |  |
| 83       | 25/-                | ..         | 475 0 0     | ..          | 18/6          | ..         | 347 16 0    | ..         | 45/-           | ..          | 851 0 0   | ..          | 5/-           | ..          | 99 0 0     | ..         | 20/-            | ..         | 376 0 0    | ..          |  |
| 84       | 22/-                | ..         | 704 0 0     | ..          | 16/6          | ..         | 528 0 0     | ..         | 40/-           | ..          | 1,280 0 0 | ..          | 5/-           | ..          | 160 0 0    | ..         | 20/-            | ..         | 640 0 0    | ..          |  |
| 85       | 12/-                | ..         | 146 8 0     | ..          | 13/-          | ..         | 158 12 0    | ..         | 20/-           | ..          | 244 0 0   | ..          | 5/-           | ..          | 61 0 0     | ..         | 20/-            | ..         | 244 0 0    | ..          |  |
| 86       | £10                 | 300 0 0    | .           | ..          | 30/-          | 45 0 0     | .           | ..         | £5             | 150 0 0     | .         | ..          | 30/-          | 45 0 0      | .          | ..         | £5              | 150 0 0    | .          | ..          |  |
| 95       | 37/-                | ..         | 35 3 0      | ..          | 58/-          | ..         | 53 4 0      | ..         | 35/-           | ..          | 33 5 0    | ..          | 40/-          | ..          | 38 0 0     | ..         | 40/-            | ..         | 38 0 0     | ..          |  |
| 96       | 12/-                | ..         | 6 12 0      | ..          | 15/-          | ..         | 8 5 0       | ..         | 18/-           | ..          | 9 18 0    | ..          | 10/-          | ..          | 5 10 0     | ..         | 16/-            | ..         | 8 16 0     | ..          |  |
| 97       | 14/-                | ..         | ..          | 32 18 0     | ..            | ..         | ..          | 28 4 0     | ..             | 11/-        | ..        | ..          | ..            | ..          | ..         | 35 5 0     | ..              | 12/-       | ..         | ..          |  |
| 99       | 8/-                 | ..         | ..          | 47 12 0     | ..            | ..         | ..          | 53 11 0    | ..             | 8/-         | ..        | ..          | ..            | ..          | ..         | 53 11 0    | ..              | 8/6        | ..         | ..          |  |
| 100      | 12/-                | ..         | ..          | 16 4 0      | ..            | ..         | ..          | 17 11 0    | ..             | 14/-        | ..        | ..          | ..            | ..          | ..         | 16 17 6    | ..              | 13/-       | ..         | ..          |  |
|          |                     |            | 205 3 2     | ..          | ..            | ..         | 205 3 2     | ..         | ..             | ..          | 205 3 2   | ..          | ..            | ..          | 205 3 2    | ..         | ..              | ..         | ..         | ..          |  |
|          | £                   | 30,757 9 0 | 10,024 16 3 | 10,712 3 11 |               | 39,963 8 6 | 8,748 9 0   | 10,659 4 3 |                | 35,955 0 0  | 8,611 0 6 | 10,257 11 8 |               | 33,169 10 0 | 7,537 6 6  | 9,782 8 11 |                 | 37,514 7 0 | 9,091 12 3 | 10,351 0 4  |  |



CONTRACT No. 69.—Return showing the relative amounts of the various tenders received based upon the quantities actually paid for—*continued.*

| Item     | Langtree & Owen |               |            | Parry & Farley. |      |             |            | J Stewart & Co |      |             |            | Carter.    | McSweeney.  | Langher     |               |
|----------|-----------------|---------------|------------|-----------------|------|-------------|------------|----------------|------|-------------|------------|------------|-------------|-------------|---------------|
|          | Rate            | Amount        | Amount     | Amount          | Rate | Amount      | Amount     | Amount         | Rate | Amount      | Amount     |            |             |             | Amount        |
|          |                 | £ s d         | £ s d      | £ s d           |      | £ s d       | £ s d      | £ s d          |      | £ s d       | £ s d      | £ s d      |             | £ s d       | £ s d         |
| 1        | 2/10            |               | 2,724 5 0  |                 | 2/-  |             | 1,923 0 0  |                | 3 6  |             | 3,315 5 0  |            | £54,320 7 7 | £59,376 1 9 | £66,579 12 11 |
| 8        | 40/-            | 15,322 0 0    |            |                 | 34/- | 13,023 14 0 |            |                | 50/- | 19,152 10 0 |            |            |             |             |               |
| 11       | 40/-            | 13,424 0 0    |            |                 | 31/- | 10,103 12 0 |            |                | 54/- | 18,122 8 0  |            |            |             |             |               |
| 12       | 8/-             |               | 36 8 0     |                 | 25/- |             | 113 15 0   |                | £4   |             | 364 0 0    |            |             |             |               |
| 14       | 40/-            |               | 808 0 0    |                 | 42/6 |             | 858 10 0   |                | 65 - |             | 1,313 0 0  |            |             |             |               |
| 16       | 8/-             | 215 12 0      |            |                 | 25/- | 673 15 0    |            |                | £4   | 2,156 0 0   |            |            |             |             |               |
| 19       | 40/-            |               | 168 0 0    |                 | 40/- |             | 168 0 0    |                | £4   |             | 336 0 0    |            |             |             |               |
| 20       | 1/3             | 1,075 0 0     |            |                 | 1/6  | 1,290 0 0   |            |                | 6d   | 430 0 0     |            |            |             |             |               |
| 21       | 1/-             | 490 18 0      |            |                 | 1 -  | 490 18 0    |            |                | 1d   | 40 18 2     |            |            |             |             |               |
| 22       | 2/-             |               | 7 8 0      |                 | 4/-  |             | 14 16 0    |                | 2 -  |             | 7 8 0      |            |             |             |               |
| 23       | 3/-             |               | 49 7 0     |                 | 2/-  |             | 32 18 0    |                | 6 -  |             | 98 14 0    |            |             |             |               |
| 29       | 13/-            |               | 85 16 0    |                 | 12/6 |             | 82 10 0    |                | 12/- |             | 79 4 0     |            |             |             |               |
| 31       | 2/6             |               | 8 5 0      |                 | 2 -  |             | 6 12 0     |                | 12/- |             | 39 12 0    |            |             |             |               |
| 31       | 32/-            |               | 1,649 12 0 |                 | 35/- |             | 1,804 5 0  |                | 40 - |             | 2,062 0 0  |            |             |             |               |
| 32       | 50/-            | 12,110 0 0    |            |                 | 45/- | 10,899 0 0  |            |                | 45 - | 10,899 10 0 |            |            |             |             |               |
| 33       | 56/-            | 5,378 16 0    |            |                 | 80/- | 7,684 0 0   |            |                | 55/- | 5,282 15 0  |            |            |             |             |               |
| 34       | 2/3             |               | 1,201 16 9 |                 | 2/6  |             | 1,335 7 6  |                | 1/-  |             | 534 3 0    |            |             |             |               |
| 35       | 4/-             |               | 12 0 0     |                 | 4/-  |             | 12 0 0     |                | 5/-  |             | 15 0 0     |            |             |             |               |
| 36       | 20/-            | 36 10 0       |            |                 | 20/- | 36 10 0     |            |                | 30/- | 54 15 0     |            |            |             |             |               |
| 38       | 15/-            |               | 3 15 0     |                 | 50/- |             | 12 10 0    |                | 20 - |             | 5 0 0      |            |             |             |               |
| 39       | 8/6             |               | 13 12 0    |                 | 3/6  |             | 5 12 0     |                | 6 -  |             | 9 12 0     |            |             |             |               |
| 40       | 10/-            |               | 15 10 0    |                 | 6/-  |             | 9 6 0      |                | 10/- |             | 15 10 0    |            |             |             |               |
| 41       | 15/-            |               | 8 5 0      |                 | 12/- |             | 6 12 0     |                | 15/- |             | 8 5 0      |            |             |             |               |
| 42       | 18/-            |               | 1 16 0     |                 | 16/- |             | 1 12 0     |                | 20/- |             | 2 0 0      |            |             |             |               |
| 43       | 1 -             |               | 883 11 0   |                 | 1/3  | 1,104 8 9   |            |                | 7d   |             | 515 8 3    |            |             |             |               |
| 45 to 82 |                 |               | 9,984 8 0  |                 |      |             | 14,058 3 9 |                |      |             |            | 9,615 19 3 |             |             |               |
| 83       | 7/6             |               | 141 0 0    |                 | 8/-  |             | 150 8 0    |                | 15 - |             | 282 0 0    |            |             |             |               |
| 84       | 7/-             |               | 224 0 0    |                 | 7/6  |             | 240 0 0    |                | 10/- |             | 320 0 0    |            |             |             |               |
| 85       | 6/-             |               | 73 4 0     |                 | 4/-  |             | 49 4 0     |                | 10/- |             | 122 0 0    |            |             |             |               |
| 86       | 30/-            | 45 0 0        |            |                 | 15/- | 22 10 0     |            |                | 20/- | 30 0 0      |            |            |             |             |               |
| 95       | 70/-            |               | 66 10 0    |                 | 56/- |             | 53 4 0     |                | 30/- |             | 28 10 0    |            |             |             |               |
| 96       | 15/-            |               | 8 5 0      |                 | 15/- |             | 8 5 0      |                | 13/- |             | 7 3 0      |            |             |             |               |
| 97       | 12/-            |               |            | 28 4 0          |      |             |            | 35 5 0         | 12/- |             |            | 28 4 0     |             |             |               |
| 99       | 9/-             |               |            | 53 11 0         |      |             |            | 71 8 0         | 9/-  |             |            | 53 11 0    |             |             |               |
| 100      | 15/-            |               |            | 20 5 0          |      |             |            | 27 0 0         | 14/- |             |            | 18 18 0    |             |             |               |
|          |                 |               | 205 3 2    |                 |      |             |            | 205 3 2        |      |             |            | 205 3 2    |             |             |               |
|          |                 | £ 48,097 16 0 | 8,190 5 9  | 10,291 11 2     |      | 44,523 19 0 | 7,992 15 3 | 14,396 19 11   |      | 56,168 16 2 | 9,479 14 3 | 9,921 15 5 |             | £51,494 9 2 | £57,456 19 7  |

APPENDIX.

Appendix No. 49—Contract 69.

LIST OF ITEMS OMITTED IN FINAL VOUCHER.

| Item | Description               | Carter.         | Ahearn         | Kerle          | McKenzie.       | McSweeney.        | Holloway.       | Carson.        | Dean.          | Langtree.      | Parry.          | Stewart.        |
|------|---------------------------|-----------------|----------------|----------------|-----------------|-------------------|-----------------|----------------|----------------|----------------|-----------------|-----------------|
|      |                           | £ s. d.         | £ s. d.        | £ s. d.        | £ s. d.         | £ s. d.           | £ s. d.         | £ s. d.        | £ s. d.        | £ s. d.        | £ s. d.         | £ s. d.         |
| 2    | Excavation, hard          | 9d. 43 13 9     | 15/- 873 15 0  | 10/- 582 10 0  | 13 6 786 7 6    | 4 - 233 0 0       | 15/- 873 15 0   | 10/- 582 10 0  | 12 - 699 0 0   | 11/- 640 15 0  | 12/- 699 0 0    | 6/- 349 10 0    |
| 3    | „ blasting                | 9d. 43 13 9     | 10 - 582 10 0  | 8 - 466 0 0    | 12/- 699 0 0    | 5 - 291 5 0       | 13/6 786 7 6    | 7/6 436 17 6   | 10/- 582 10 0  | 6/- 349 10 0   | 9/- 524 5 0     | 5/6 320 7 6     |
| 4    | „ „ „                     | 9d. 43 13 9     | 11/- 640 15 0  | 8/- 466 0 0    | 9/- 524 5 0     | 5/- 231 5 0       | 12/6 728 2 6    | 5/- 291 5 0    | 9 - 524 5 0    | 5/- 320 7 6    | 8/- 466 0 0     | 5 - 291 5 0     |
| 5    | „ less hard               | 27/6 1,113 10 0 | 10/- 405 0 0   | 7/- 283 10 0   | 9 - 364 10 0    | 20 - 810 0 0      | 20/- 810 0 0    | 10/- 405 0 0   | 16/- 648 0 0   | 8/- 324 0 0    | 25/- 1,012 10 0 | 30/- 1,215 0 0  |
| 6    | „ gadding                 | 27/6 1,567 10 0 | 18/- 1,026 0 0 | 25/- 1,425 0 0 | 22/6 1,282 10 0 | 37/6 2,137 10 0   | 25/- 1,425 0 0  | 25/- 1,425 0 0 | 20 - 1,140 0 0 | 42/- 2,394 0 0 | 40/- 2,280 0 0  | 60/- 3,420 0 0  |
| 7    | „ light blast             | 27/6 1,567 10 0 | 15/- 855 0 0   | 23/- 1,311 0 0 | 18/- 1,026 0 0  | 32/6 1,852 10 0   | 22 6 1,282 10 0 | 20/- 1,140 0 0 | 18 - 1,026 0 0 | 41/- 2,337 0 0 | 35/- 1,995 0 0  | 54/- 3,078 0 0  |
| 13   | „ hard, and light blast   | 4 - 89 0 0      | 15/- 333 15 0  | 20/- 445 0 0   | 27/- 600 15 0   | 23/- 511 15 0     | 30/- 667 10 0   | 40/- 890 0 0   | 20 - 445 0 0   | 41/- 912 5 0   | 45/- 1,001 5 0  | 70/- 1,557 10 0 |
| 15   | „ gadding and gutter      | 4/- 89 0 0      | 20/- 445 0 0   | 23/- 511 15 0  | 30/- 667 10 0   | 34/- 756 10 0     | 40 - 990 0 0    | 45/- 1,001 5 0 | 12/- 102 0 0   | 8 0 68 0 0     | 20/- 212 10 0   | £4 680 0 0      |
| 17   | „ hard sandstone          | 5/- 28 15 0     | 20/- 115 0 0   | 3/- 17 5 0     | 27/- 155 5 0    | 26 6 152 7 6      | 40/- 220 0 0    | 30/- 172 10 0  | 20/- 115 0 0   | 42/- 241 10 0  | 45/- 258 15 0   | £5 575 0 0      |
| 18   | „ „ light blast           | 5/- 28 15 0     | 18/- 103 10 0  | 15/- 86 5 0    | 22 6 129 7 6    | 23/- 132 5 0      | 35/- 211 5 0    | 25/- 143 15 0  | 20/- 115 0 0   | 41/- 235 15 0  | 42 6 244 7 6    | 84/- 488 15 0   |
| 23   | Subduct                   | 1d. 1 3 4       | 20/- 280 0 0   | 10/- 140 0 0   | 15/- 210 0 0    | 3/- 42 0 0        | 10/- 180 0 0    | 6/- 84 0 0     | 20/- 280 0 0   | 2/- 28 0 0     | 3/- 42 0 0      | 6/- 84 0 0      |
| 24   | „ 6"                      | 1d. 2 13 4      | 6 - 192 0 0    | 4/6 144 0 0    | 9/- 288 0 0     | 5/- 160 0 0       | 5 - 160 0 0     | 7/6 240 0 0    | 10/- 320 0 0   | 4/- 128 0 0    | 3/- 96 0 0      | 3/- 96 0 0      |
| 25   | „ 9"                      | 1d. 2 13 4      | 8/- 256 0 0    | 5 - 160 0 0    | 14/- 448 0 0    | 6/- 192 0 0       | 6/- 192 0 0     | 7/6 240 0 0    | 15/- 480 0 0   | 5/3 168 0 0    | 3 6 112 0 0     | 4/- 128 0 0     |
| 26   | „ 6"                      | 1d. 1 3 4       | 7/- 98 0 0     | 7/- 98 0 0     | 12/- 168 0 0    | 6/- 84 0 0        | 7/6 105 0 0     | 10/- 140 0 0   | 18/- 252 0 0   | 7/- 980 0 0    | 5/- 70 0 0      | 5 - 70 0 0      |
| 27   | „ 9"                      | 1d. 1 3 4       | 9/- 126 0 0    | 9/- 126 0 0    | 18 - 252 0 0    | 8 - 112 0 0       | 10/- 140 0 0    | 12/6 175 0 0   | 20 - 280 0 0   | 8/3 115 10 0   | 6 - 84 0 0      | 6/- 84 0 0      |
| 37   | Freestone pitches         | 20/ 38 0 0      | 8/- 15 4 0     | 35/- 66 10 0   | 10/- 19 0 0     | 10 - 19 0 0       | 20/- 38 0 0     | 15 - 28 10 0   | 15 - 28 10 0   | 9 - 17 2 0     | 12/- 22 16 0    | 20/- 38 0 0     |
| 44   | Removing 1/4 mile further | 1d. 125 0 0     | 3d. 375 0 0    | 1d. 125 0 0    | 3d. 375 0 0     | 4 1/2 d. 562 10 0 | 6d. 750 0 0     | 4d. 500 0 0    | 1/- 1,500 0 0  | 4d. 500 0 0    | 3/- 337 0 0     | 1d. 125 0 0     |
| 87   | Puddle                    | 2/- 1 0 0       | 7/- 3 10 0     | 1/- 0 10 0     | 4/- 2 0 0       | 12/- 6 0 0        | 20/- 10 0 0     | 10/- 5 0 0     | 10/- 5 0 0     | 6 - 3 0 0      | 3/- 1 10 0      | 6/- 3 0 0       |
| 88   | Special con               | 50/- 25 0 0     | 60/- 30 0 0    | 50/- 25 0 0    | 45 - 22 10 0    | 60 - 30 0 0       | 60/- 30 0 0     | 45/- 22 10 0   | 10/- 35 0 0    | 61/- 30 0 0    | 60/- 30 0 0     | 70/- 35 0 0     |
| 89   | 1 1/2" metal              | 10/- 7 10 0     | 15/- 11 5 0    | 12/- 9 0 0     | 13/- 9 15 0     | 15 - 11 5 0       | 18/- 13 10 0    | 15/- 11 5 0    | 17/- 12 15 0   | 15/- 11 5 0    | 12/6 9 7 6      | 14/- 9 15 0     |
| 90   | 2" sandstone              | 3/- 2 15 0      | 8/- 6 0 0      | 3/- 2 5 0      | 5 - 3 15 0      | 8/- 6 0 0         | 16/- 12 0 0     | 5/- 3 15 0     | 11/- 8 5 0     | 5/- 3 15 0     | 4/- 3 0 0       | 12/- 9 15 0     |
| 91   | 2 1/2" bluestone          | 10/- 7 10 0     | 14 - 10 10 0   | 11 - 8 5 0     | 12 - 9 0 0      | 14/- 10 10 0      | 15 - 11 5 0     | 14/- 10 10 0   | 16 - 12 0 0    | 15/- 11 5 0    | 12/6 9 7 6      | 12/- 9 0 0      |
| 92   | Sand                      | 10/- 7 10 0     | 5/- 3 15 0     | 4/- 3 0 0      | 5 - 3 15 0      | 12/- 9 0 0        | 10/- 7 10 0     | 5/- 3 15 0     | 10/- 7 10 0    | 5/- 3 15 0     | 10/- 7 10 0     | 6/- 4 10 0      |
| 93   | Hardwood                  | 1 6 7 10 0      | 3/- 15 0 0     | 2/- 10 0 0     | 2 3 11 5 0      | 3/- 15 0 0        | 5/6 27 10 0     | 1/- 5 0 0      | 6 - 30 0 0     | 2/6 12 10 0    | 1/6 7 10 0      | 2/- 10 0 0      |
| 94   | Oregon                    | 1/6 7 10 0      | 2 6 12 10 0    | 2 3 11 5 0     | 2 6 12 10 0     | 4/- 20 0 0        | 5 6 27 10 0     | 1/- 5 0 0      | 7/- 35 0 0     | 2/6 12 10 0    | 1 8 8 6 8       | 2/- 10 0 0      |
|      |                           | 4,853 2 11      | 6,814 19 0     | 6,523 0 0      | 8,070 0 0       | 8,447 12 6        | 9,698 15 0      | 7,962 7 6      | 8,682 15 0     | 9,847 14 6     | 9,584 0 2       | 12,691 7 6      |

## Appendix No. 50.

MONIER Arch Culvert, Burwood.

Area of arch, 54 feet x 6 feet 6 inches = 351 feet sup.

|  |     |              |          |
|--|-----|--------------|----------|
| Cubic contents of 4½-inch work .....   | 47  | cubic yards. |          |
| Cubic contents if of 9-inch work .....   | 9½  | "            |          |
| Cubic contents if of 14-inch work .....  | 14½ | "            | £ s. d.  |
| Estimated cost of brick in cement arch in 9-inch work—9½ cubic yards at 45s. per cubic yard.....                           |     |              | 21 18 9  |
| Or equal to 4½-inch Monier compo. work at 90s. per cubic yard.   |     |              |          |
| Estimated cost of brick in cement arch in 14-inch work—14½ cubic yards at 45s. per cubic yard.....                         |     |              | 32 18 1½ |
| Or £4 2s. less than actual cost of present Monier arch, which amounts to £7 11s. 6d. per cubic yard,<br>or a total of £37. |     |              |          |

J. SYMONDS, 11/8/96.

## Appendix No. 51.

COMPARATIVE Estimate—Western and Canterbury Branches, from Chamber, Premier-street, to Shaft, Illawarra Road—8 ft. x 7 ft. Sewer.

| Description of Work.               | Quantity.                | Rate.    | Amount.    |
|------------------------------------|--------------------------|----------|------------|
|                                    | Quantity.                | Rate.    | Amount.    |
|                                    | cub. yards.              | £ s. d.  | £ s. d.    |
| Excavation.....                    | 2·1884 + 388 x 516 ..... | 1,329·43 | 1,828 1 6  |
| Bluestone concrete .....           | 317 x 516 .....          | 163·57   | 351 13 6   |
| Sandstone „ .....                  | 1285 x 516 .....         | 66·3     | 132 12 0   |
| Brickwork .....                    | 3588 x 516 .....         | 185·14   | 509 2 6    |
| Rendering .....                    | 1·3963 x 516 .....       | 720·5    | 180 2 6    |
| Sandstone concrete (filling) ..... | 1·15 x 516 .....         | 539·4    | 1,186 16 0 |
| New gas-check .....                | .....                    | .....    | 85 0 0     |
|                                    |                          |          | £4,273 8 0 |

COMPARATIVE Estimate—Construction of Sewers, Western and Canterbury Branches, from Chamber, Premier-street, to Shaft, Illawarra Road—8 ft. x 7 ft. Sewer.

| Description of Work.     | Quantity.                | Rate.    | Amount.     |
|--------------------------|--------------------------|----------|-------------|
|                          | Quantity.                | Rate.    | Amount.     |
|                          | cub. yards.              | £ s. d.  | £ s. d.     |
| Excavation.....          | 2·1884 + 388 x 516 ..... | 1,329·43 | 1,828 1 6   |
| Bluestone concrete ..... | 637 x 516 .....          | 328·69   | 706 13 10   |
| Sandstone „ .....        | 1244 x 516 .....         | 64·2     | 128 8 0     |
| Brickwork .....          | 3588 x 516 .....         | 185·14   | 509 2 7     |
| Rendering .....          | 1·3963 x 516 .....       | 720·49   | 180 2 6     |
| Filling.....             | 8 x 516 .....            | 412·8    | 15 9 7      |
| New gas-check .....      | .....                    | .....    | 85 0 0      |
|                          |                          |          | £3,452 18 0 |

COMPARATIVE Estimate—Construction of Sewers, Western and Canterbury Branches, from Chamber, Premier-street, to Shaft, Illawarra Road—6 ft. 10 in. x 5 ft. 10 in., and 5 ft. 2 in. x 4 ft. 2 in. Sewers.

| Description of Work.                    | Quantity.         | Rate.   | Amount.     |
|---|-------------------|---------|-------------|
|   | Quantity.         | Rate.   | Amount.     |
|   |                   | £ s. d. | £ s. d.     |
| Excavation .....                        | 2·987 x 516 ..... | 1,541·3 | 2,119 6 0   |
| Bluestone concrete.....                 | 69 x 516 .....    | 356·0   | 765 8 0     |
| Sandstone „ .....                       | 31 x 516 .....    | 160·0   | 320 0 0     |
| Brickwork (two rings of brickwork)..... | 481 x 516 .....   | 248·2   | 682 11 0    |
| Rendering .....                         | 2·22 x 516 .....  | 1,145·5 | 286 7 6     |
|   |                   |         | £4,173 12 6 |

COMPARATIVE Estimate—6 ft. 10 in. x 5 ft. 10 in., and 5 ft. 2 in. x 4 ft. 2 in.

| Description of Work.     | Quantity.                        | Rate.   | Amount.      |
|--------------------------|----------------------------------|---------|--------------|
|                          | Quantity.                        | Rate.   | Amount.      |
|                          |                                  | £ s. d. | £ s. d.      |
| Excavation .....         | 2·987 x 516 .....                | 1,541·3 | 2,119 6 0    |
| Bluestone concrete ..... | 69 x 516 .....                   | 356     | 765 8 0      |
| Sandstone „ .....        | 581 x 516 .....                  | 299·84  | 599 13 5½    |
| Brickwork .....          | 21 x 516 (one ring of brickwork) | 108·36  | 298 0 0      |
| Rendering .....          | 2·22 x 516 .....                 | 1,145·5 | 286 7 6      |
|                          |                                  |         | £4,068 14 5½ |

## Appendix No. 52.

CONTRACT No. 69.—This is the Schedule of Quantities and Prices hereinbefore referred to.

| No. of Item | Description of Work.   | Unit.       | Probable Quantity. | Rate per Unit. | Amount.    |
|-------------|--|-------------|--------------------|----------------|------------|
|             |  |             |                    |                | £ s. d.    |
| 1           | Excavations in open trenches, in more or less hard materials, and in hard rock, for sewers, branches, pipes, sub-ducts, &c., as specified in clause 3, as viz. :—  |             |                    |                |            |
| 1           | Excavation in road surfaces, sand, soil, pipeclay, shale, soft rock, where in the opinion of the Engineer blasting is unnecessary.....   | cubic yard  | 19,320             | 3/6            | 3,381 0 0  |
| 2           | Excavation in hard shale or rock, where gadding and guttering only is permitted.....   | "           | 1,165              | 6/-            | 349 10 0   |
| 3           | Excavation in hard shale or rock, where charges of powder not exceeding 2 in. in length by 1½ in. in diameter, and such depths of boreholes as shall be directed only are permitted.....                       | "           | 1,165              | 5/6            | 320 7 6    |
| 4           | Excavation in hard shale or rock, where charges of powder not exceeding 4 in. in length by 1½ in. in diameter, and such depths of boreholes as shall be directed only are permitted.....                       | "           | 1,165              | 5/-            | 291 5 0    |
| 5           | Excavation in tunnels in "more or less hard materials," for sewers, pipe-sewers, sub-ducts, &c., as specified in clause 3, as viz. :—  |             |                    |                |            |
| 5           | Less hard excavation in clay, loose, and jointy shale, &c., where in the opinion of the Engineer blasting is unnecessary.....  | "           | 810                | 30/-           | 1,215 0 0  |
| 6           | Excavation in hard sandstone or shale, where gadding and guttering only is permitted.....  | "           | 1,140              | 60/-           | 3,420 0 0  |
| 7           | Excavation in hard sandstone, shale, ironstone, &c., where charges of powder not exceeding 2 in. in length by 1½ in. in diameter, and such depth of boreholes as shall be directed only are permitted....      | "           | 1,140              | 54/-           | 3,078 0 0  |
| 8           | Excavations in hard sandstone, shale, ironstone, &c., where charges of powder not exceeding 4 in. in length by 1½ in. in diameter, and such depth of boreholes as shall be directed only are permitted....     | "           | 1,140              | 50/-           | 2,850 0 0  |
| 9           | Excavation in tunnels in "solid rock" for sewers, pipe-sewers, sub-ducts, &c., as specified in clause 3, as viz. :—  |             |                    |                |            |
| 9           | Excavation in hard rock, where gadding and guttering only is permitted.....  | "           | 1,850              | 60/-           | 5,550 0 0  |
| 10          | Excavation in hard rock, where charges of powder not exceeding 2 in. in length by 1½ in. in diameter, and such depths of bore-holes as shall be directed only are permitted.....                               | "           | 1,850              | 56/-           | 5,180 0 0  |
| 11          | Excavation in hard rock, where charges of powder not exceeding 4 in. in length by 1½ in. in diameter, and such depth of bore-holes as shall be directed only are permitted.....                                | "           | 1,850              | 54/-           | 4,995 0 0  |
| 12          | Excavation in "solid rock," in shafts, shaft chambers, and sumps, as specified in clause 3, as viz. :—   |             |                    |                |            |
| 12          | Excavation in road surfaces, soil, clay, pipeclay, shale, and soft rock only, where in the opinion of the Engineer blasting is unnecessary.....  | "           | 130                | £4             | 520 0 0    |
| 13          | Excavation in hard rock, where charges of powder not exceeding 2 in. in length by 1½ in. in diameter, and such depths of bore-holes as shall be directed only are permitted.....                               | "           | 445                | 70/-           | 1,557 10 0 |
| 14          | Excavation in hard rock, where charges of powder not exceeding 4 in. in length by 1½ in. in diameter, and such depths of bore-holes as shall be directed only are permitted.....                               | "           | 445                | 65/-           | 1,446 5 0  |
| 15          | Excavation in hard rock, where gadding and guttering only is permitted.....  | "           | 445                | £4             | 1,780 0 0  |
| 16          | Excavation in "more or less hard ground," in shafts, shaft chambers, and sumps, as specified in clause 3, as viz. :—   |             |                    |                |            |
| 16          | Less hard excavation in road services, soil, clay, pipeclay, loose and jointy shale, and soft rock, where in the opinion of the Engineer blasting is unnecessary.....  | "           | 170                | £4             | 680 0 0    |
| 17          | Excavation in hard sandstone or shale, where guttering and gadding only is permitted.....  | "           | 115                | 100/-          | 575 0 0    |
| 18          | Excavation in hard sandstone or shale, ironstone, &c., where charges of powder not exceeding 2 in. in length by 1½ in. in diameter, and such depth of bore-holes as shall be directed only are permitted.....  | "           | 115                | 85/-           | 488 15 0   |
| 19          | Excavation in hard sandstone or shale, ironstone, &c., where charges of powder not exceeding 4 in. in length by 1½ in. in diameter, and such depths of bore-holes as shall be directed only are permitted..... | "           | 115                | 80/-           | 460 0 0    |
| 20          | Filling in at sides, round and over all concrete and brickwork of sewers, shafts, chambers, pipes, embankments, and tunnels, as specified in clause 5.....   | "           | 15,220             | -/6            | 380 10 0   |
| 21          | Timber ordered in writing to be left in excavations, as specified in clause 9, including all iron used in fixing same.....   | cubic foot  | 9,000              | -/1            | 37 10 0    |
| 22          | Removing existing culverts crossing the Illawarra Road, as specified in clause 12, including masonry, pitching, and timber decking....   | cubic yard  | 244                | 2/-            | 24 8 0     |
| 23          | Sub-duct in hard rock, with tile covers, as specified in clause 8.....   | lineal yard | 280                | 6/-            | 84 0 0     |
| 24          | Sub-duct, as specified in clause 8, in "more or less hard material," including dry or cement jointing for stoneware pipes :—   |             |                    |                |            |
| 24          | Of 6-inch internal diameter.....   | "           | 640                | 3/-            | 96 0 0     |
| 25          | Of 9-inch internal diameter.....   | "           | 640                | 4/-            | 128 0 0    |
| 26          | Sub-duct in water-charged loose ground, as specified in clause 8, including hardwood boxes with packing in same, and dry or cement jointing for pipes of :—  |             |                    |                |            |
| 26          | 6-inch internal diameter.....  | "           | 280                | 5/-            | 70 0 0     |
| 27          | 9-inch internal diameter.....  | "           | 280                | 6/-            | 84 0 0     |
| 28          | Hand-packed stone filling 4-inch gauge, as specified in clauses 8 and 10.....  | cubic yard  | 760                | 6/-            | 228 0 0    |
| 29          | Bluestone metal 2½-in. gauge, on road surfaces, as specified in clause 10.....   | "           | 190                | 12/-           | 114 0 0    |
| 30          | Blinding 2 in. thick over metal surfaces, as specified in clause 10.....   | "           | 90                 | 12/-           | 54 0 0     |
| 31          | Sandstone concrete, in any situation, as specified in clause 13.....   | "           | 1,050              | 40/-           | 2,100 0 0  |

| No<br>o<br>Item. | Description of Work.  | Unit.       | Probable Quantity. | Rate<br>per<br>Unit. | Amount.     |
|------------------|---|-------------|--------------------|----------------------|-------------|
|                  |   |             |                    |                      | £ s. d.     |
| 32               | Bluestone concrete, in any situation, as specified in clause 13 .....   | cubic yard  | 4,550              | 45/-                 | 10,237 10 0 |
| 33               | Brickwork in cement, in any situation, as specified in clause 15 .....  | "           | 1,605              | 55/-                 | 4,413 15 0  |
| 34               | Cement facing, in any situation, as specified in clause 14 .....  | square yd.  | 11,600             | 1/-                  | 580 0 0     |
| 35               | Pymont sandstone, ashlar, in any situation, as specified in clause 16 .....   | cubic foot  | 210                | 5/-                  | 52 10 0     |
| 36               | Squared bluestone pitchers, in any situation, as specified in clause 17 .....   | square yd.  | 12                 | 30/-                 | 18 0 0      |
| 37               | Squared freestone pitchers, in any situation, 6 in. deep, as specified in clause 18 .....   | "           | 38                 | 20/-                 | 38 0 0      |
| 38               | Supply and fix ordnance fencing complete, with ironwork, painting, and tarring, as specified in clause 11.....  | rod .....   | 7                  | 20/-                 | 7 0 0       |
|                  | Providing, laying, and jointing glazed stoneware, plain, junction, and bend pipes, in trenches, shafts, &c., as specified in clause 19, including providing and fixing discs, complete, as viz. :—                    |             |                    |                      |             |
| 39               | 9-in. diameter pipes in pipe-sewers and shafts .....  | lineal yard | 40                 | 6/-                  | 12 0 0      |
| 40               | 12-in. diameter pipes in pipe-sewers.....   | "           | 64                 | 10/-                 | 32 0 0      |
| 41               | 16-in. diameter pipes in pipe-sewers.....   | "           | 15                 | 15/-                 | 11 5 0      |
| 42               | 18-in. diameter pipes in pipe-sewers .....  | "           | 5                  | 20/-                 | 5 0 0       |
|                  | SURPLUS MATERIALS.  |             |                    |                      |             |
|                  | Removal of surplus materials from all excavations, as specified in clauses 51, 54, and 86 of the Schedule to Specification, including spreading, as viz. :—   |             |                    |                      |             |
| 43               | For the first half-mile of lead.....  | cubic yard  | 20,420             | -/7                  | 595 1 2     |
| 44               | For every further quarter of a mile of lead.....  | "           | 30,000             | -/1                  | 125 0 0     |
|                  | GOVERNMENT PROPERTY.  |             |                    |                      |             |
| 45               | Receiving and fixing ironwork, supplied by the Government, as specified in clauses 272 to 275 of the Schedule to Specification.....   | ton .. .. . | 25                 | £3                   | 75 0 0      |
|                  | IRONWORK.   |             |                    |                      |             |
|                  | Manufacture, supply, and fix (except where otherwise specified) all wrought-iron, gun-metal, and cast-iron work, and including painting and tarring, complete, as specified in clauses 21 to 26 inclusive, as viz. :— |             |                    |                      |             |
|                  | PENSTOCKS.  |             |                    |                      |             |
| 46               | Cast-iron frame and penstock, 6-ft. diameter opening, with lifting gear, wrought-iron and gun-metal work, complete, as shown on drawings Nos. 20 and 3.....   | each .....  | 3                  | £180                 | 540 0 0     |
| 47               | Cast-iron frame and penstock, 3-ft. 9-in. diameter opening, with lifting gear, street-box, cover-plate, wrought-iron and gun-metal work, complete, as shown on drawings Nos. 19 and 14.....                           | " .....     | 2                  | £140                 | 280 0 0     |
| 48               | Cast-iron frame and penstock of 2-ft. diameter opening, with 2-ft. diameter spigot and flanged bend, lifting gear, street-box, wrought-iron and gun-metal work, complete, as shown on drawings Nos. 14 and 18 .....   | " .....     | 1                  | £100                 | 100 0 0     |
|                  | GAS-CHECKS.   |             |                    |                      |             |
| 49               | Cast-iron frame with Muntz metal gas-check for sewer of 6 ft. 10 in. x 5 ft. 10 in., with all wrought-iron and gun-metal work, complete, as shown on drawings Nos. 23 and 3 .....                                     | " .....     | 1                  | £80                  | 80 0 0      |
| 50               | Cast-iron frame with Muntz metal gas-check for sewer of 6 ft. 8 in. x 5 ft. 8 in., with all wrought-iron and gun-metal work, complete, as shown on drawings Nos. 24 and 3 .....                                       | " .....     | 1                  | £70                  | 70 0 0      |
| 51               | Cast-iron frame with Muntz metal gas-check for sewer of 5 ft. 6 in. x 4 ft. 6 in., with all wrought-iron and gun-metal work, complete, as shown on drawings Nos. 25 and 3.....  | " .....     | 1                  | £62                  | 62 0 0      |
| 52               | Cast-iron frame with Muntz metal gas-check for sewer of 5 ft. 2 in. x 4 ft. 2 in., with all wrought-iron and gun-metal work complete, as shown on drawings Nos. 26 and 3 .....  | " .....     | 1                  | £60                  | 60 0 0      |
| 53               | Cast-iron frame with Muntz metal gas-check for sewer of 5 ft. 1 in. x 4 ft. 1 in., complete, with all wrought-iron and gun-metal work, as shown on drawings Nos. 27 and 17 .....                                      | " .....     | 1                  | £54                  | 54 0 0      |
|                  | IRREGULAR CASTINGS, &c.   |             |                    |                      |             |
| 54               | Cast-iron flange and faucet pipe, 3 ft. 9 in. internal diameter, 8 ft. long in the body, as shown on drawings Nos. 14 and 16 .....  |             |                    |                      |             |
| 55               | Cast-iron pipe, 3 ft. 9 in. internal diameter, 8 ft. long over all, with two flange ends, one flange turned and drilled for 1½-in. diameter bolt-holes, as shown on drawings Nos. 14 and 16, weighing.....            |             | 2 2 3 4            | £16                  | .....       |
| 56               | Cast-iron flange and spigot pipe, 3 ft. 9 in. internal diameter, 9 ft. long over all, the flange to be turned and drilled for 1½-in. diameter bolt-holes, as shown on drawing No. 16, weighing.....                   |             | 2 0 0 18           | £16                  | .....       |
| 57               | Cast-iron pipe, 3 ft. 9 in. internal diameter, 10 ft. long over all, with spigot ends, as shown on drawing No. 16 .....   |             | 1 16 3 13          | £16                  | .....       |
| 58               | Cast-iron thimble, for 3-ft. 9-in. diameter siphon pipes, 18 in. long over all, as shown on drawing No. 16.....   |             | 2 5 3 23           | £16                  | .....       |
| 59               | 2—cast-iron flanged pipes, 3 ft. 6 in. internal diameter, 10 ft. long over all, one flange turned and drilled for 1½-in. diameter bolt-holes, as shown on drawings Nos. 17 and 18.....                                |             | 0 11 3 20          | £16                  | .....       |
| 60               | 2—cast-iron flange and faucet pipes, 3 ft. 6 in. internal diameter, 12 ft. long in the body, as shown on drawings Nos. 17 and 18 .....  |             | 4 12 2 2           | £16                  | .....       |
| 61               | 2—cast-iron flange and spigot pipes, 3 ft. 6 in. internal diameter, 10 ft. long over all, the flange to be turned and drilled for 1½ in. diameter bolt-holes, as shown on drawing No. 18 .....                        |             | 5 16 0 6           | £16                  | .....       |
| 62               | Cast-iron spigot pipe, 3 ft. 6 in. internal diameter, 10 ft. long over all, as shown on drawing No. 18.....   |             | 4 9 2 2            | £16                  | .....       |
| 63               | Cast-iron spigot pipe, 3 ft. 6 in. internal diameter, 6 ft. 6 in. long over all, as shown on drawing No. 18.....  |             | 2 2 3 25           | £16                  | .....       |
|                  |   |             | 1 7 3 20           | £16                  | .....       |

| No of Item. | Description of Work.   | Unit.       | Probable Quantity.             | Rate per Unit. | Amount.          |
|-------------|--|-------------|--------------------------------|----------------|------------------|
| 64          | Cast-iron spigot and faucet pipe, 3 ft. 6 in. internal diameter, 4 ft. 10 in. long in the body, as shown on drawing No. 18.....  | .....       | Tons. cwt. qr. lb.<br>1 5 2 24 | £16            | £ s. d.<br>..... |
| 65          | 2—cast-iron thimbles for 3-ft. 6-in. diameter pipe-sewer, 18 in. long over all, as shown on drawing No. 18 .....   | .....       | 1 0 2 14                       | £16            | .....            |
| 66          | Cast-iron flange and faucet pipe, 2 ft. internal diameter, 10 ft. long over all, drawings Nos. 15 and 16 .....   | .....       | 0 19 0 4                       | £16            | .....            |
| 67          | 2—cast-iron flange and spigot pipes, 2 ft. internal diameter, 10 ft. long over all, the flange to be turned and drilled for 1½-in. diameter bolt-holes, as shown on drawing No. 16.....  | .....       | 1 13 3 18                      | £16            | .....            |
| 68          | Cast-iron thimble for 2-ft. diameter scour-pipes, 15 in. long over all, as shown on drawing No. 16.....  | .....       | 0 4 1 5                        | £16            | .....            |
| 69          | Cast-iron flanged bend, 12 in. internal diameter, as shown on drawings Nos. 14 and 16.....   | .....       | 0 14 1 0                       | £16            | .....            |
| 70          | Cast-iron flange and spigot bend, 16 in. internal diameter, as shown on drawings Nos. 3 and 10 .....   | .....       | 0 8 1 19                       | £16            | .....            |
|             | Total, including placing on cement mortar bedding, where ordered, and fixed (except lead joints) in position in the works .....  |             | 33 12 3 12                     | £16            | 538 5 9          |
| 71          | 2—wrought-iron rolled girders for supporting lifting gear of penstocks at Premier-street shaft-chamber, 25 ft. long each, weighing per foot run 46 lb., as shown on drawings Nos. 3 and 20.....  | ton.        | 1 0 2 4                        | £15            | 15 8 0           |
| 72          | Platform for working penstocks in Premier-street shaft-chamber, consisting of two wrought-iron rolled girders, 25 ft. long each, weight per foot run 19 lb., with cast-iron gratings and wrought-iron standard and railings, complete, as shown on drawings Nos. 3 and 22, weighing in all ..... | cwt.        | 1 4 2 15                       | 25/-           | 30 15 9          |
| 73          | Cast-iron standards and wrought-iron tube-railing at top of shaft, and solid bar-railings across shaft at landings, complete, as shown on drawing No. 4.....   | .....       | 0 4 1 11                       | 60/-           | 13 1 0           |
| 74          | Wrought-iron ladder in shaft, with supports, in four lengths, complete, as shown on drawing No. 4 .....  | .....       | 0 16 2 15                      | 60/-           | 49 17 6          |
| 75          | 3—angle-iron bearers, with cast-iron perforated landing-plates in shaft, complete, as shown on drawing No. 4.....  | .....       | 0 15 2 27                      | 30/-           | 27 0 0           |
| 76          | Wrought-iron hinged gratings, for outlet well of siphon, with cast-iron hinge-plates and wrought-iron channel-girders, complete, as shown on drawings Nos. 14 and 21 .....   | .....       | 0 4 1 20                       | 50/-           | 10 13 0          |
| 77          | Wrought-iron hinged gratings, for inlet well of siphon, with cast-iron hinge-plates and wrought-iron channel-girders, complete, as shown on drawings Nos. 14 and 21.....   | .....       | 0 9 1 11                       | 40/-           | 18 14 0          |
|             | CAST-IRON PIPES.   |             |                                |                |                  |
|             | Cast-iron straight, spigot, and faucet pipes, 12 ft. long in the body, complete, as shown on drawings Nos. 16 and 18, as viz. :—   |             |                                |                |                  |
| 78          | 96—3-ft. 9-in. diameter siphon pipes .....   | .....       | 289 4 0 0                      | 9/10/-         | 2,746 8 0        |
| 79          | 154—3-ft. 6-in. diameter duplicate sewer-pipes.....  | .....       | 435 5 0 14                     | 9/10/-         | 4,134 18 9       |
| 80          | 59—2-ft. diameter scour-pipes .....  | .....       | 63 16 3 20                     | £11            | 702 7 0          |
| 81          | 74—screw-bolts, 1½-in. diameter, with hexagon heads and nuts, for 3-ft. 6-in. and 3-ft. 9-in. diameters flange pipe-joints.....  | .....       | 0 2 0 23                       | 56/-           | 6 3 6            |
| 82          | 15—screw-bolts, 1 in. diameter, with hexagon heads and nuts, for 2-ft. diameter flange pipe-joints .....   | .....       | 0 0 1 26                       | 56/-           | 1 7 0            |
|             | Total for all straight pipes .....   | ton.        | 788 8 2 27                     |                |                  |
|             | PIPE-LAYING.   |             |                                |                |                  |
|             | Laying and jointing (including providing lead and spun-yarn) the 3-ft. 9-in. diameter, the 3-ft. 6-in. diameter, and the 2-ft. diameter cast-iron pipes, and irregular castings in open trenches and shafts, as specified in clause 20, complete, as viz. :—                                     |             |                                |                |                  |
| 83          | 3-ft. 9-in. diameter siphon pipes and short ends, &c. ....   | lineal yard | 396                            | 15/-           | 297 0 0          |
| 84          | 3-ft. 6-in. diameter duplicate sewer-pipes, short ends, &c.....  | .....       | 649                            | 10/-           | 324 10 0         |
| 85          | 2-ft. diameter scour-pipes and short ends, &c. ....  | .....       | 246                            | 10/-           | 123 0 0          |
|             | TRAPPED JUNCTIONS.   |             |                                |                |                  |
| 86          | Flap-traps, providing, delivering, and building in, including providing and fixing discs .....   | each        | 10                             | 20/-           | 10 0 0           |
|             | GENERAL.   |             |                                |                |                  |
| 87          | Permanent puddle, where ordered in any situation in the construction of these works (temporary puddle ordered for purposes of execution of work not to be paid for), as specified in clause 29, including spreading in 9-in. layers and ramming, complete .....                                  | cubic yard  | 10                             | 6/-            | 3 0 0            |
| 88          | Special bluestone concrete, in any situation, as specified in clause 2.....  | .....       | 10                             | 70/-           | 35 0 0           |
| 89          | Bluestone metal (clause 2), 1½-in. gauge, stacked .....  | .....       | 15                             | 14/-           | 10 10 0          |
| 90          | Sandstone metal (clause 2), 2-in. gauge, stacked .....   | .....       | 15                             | 12/-           | 9 15 0           |
| 91          | Bluestone metal (clause 2), 2½-in. gauge, stacked .....  | .....       | 15                             | 12/-           | 9 0 0            |
| 92          | Sharp, clean, washed sand (clause 2), stacked .....  | .....       | 15                             | 6/-            | 4 10 0           |
| 93          | Sawn hardwood, in scantlings or planks (clause 2) .....  | cubic foot  | 100                            | 2/-            | 10 0 0           |
| 94          | Oregon timber, in scantlings or planks.....  | .....       | 100                            | 2/-            | 10 0 0           |
| 95          | Wrought-iron, in bolts, galvanised step-irons, screws, nails, spikes, straps, &c. (clause 2) .....   | cwt.        | 20                             | 30/-           | 30 0 0           |
| 96          | Portland cement .....  | cask        | 25                             | 13/-           | 16 5 0           |
| 97          | Artisan or mechanic, supplied by Contractor.....   | day         |                                | Rate only      | 12/-             |
| 98          | Quarryman or other skilled labourer, supplied by Contractor.....   | .....       |                                | .....          | 10/-             |
| 99          | Ordinary labourer, supplied by Contractor.....   | .....       |                                | .....          | 9/-              |
| 100         | Cart with one horse and driver, supplied by Contractor.....  | .....       |                                | .....          | 14/-             |
| 101         | One additional horse, supplied by Contractor .....   | .....       |                                | .....          | 8/-              |
|             | TOTAL .....  |             |                                | £              | 68,173 10 11     |

SUMMARY of Weights of Wrought and Cast Ironwork, including all Gun-metal.

(The number of Items underneath correspond with those of the Schedule of the Quantities and Prices.)

| No of Item  | Description of Item.  | Number required | Weight of each Item. | Total weight.   |
|---|---|-----------------|----------------------|-----------------|
| <b>PENSTOCKS.</b>   |   |                 |                      |                 |
|   |   |                 | Ts. ct. qr. lb.      | Ts. ct. qr. lb. |
| 46  | Cast-iron frame and penstock, with 6-ft. diameter opening, with all lifting gear, screw-bolts, anchor-bolts, and gun-metal, complete  | 3               | 6 5 1 22             | 18 16 1 10      |
| 47  | Cast-iron frame and penstock, with 3-ft. 9 in. diameter opening, with all lifting gear, screw-bolts, anchor-bolts, and gun-metal, complete  | 2               | 3 7 0 4              | 6 14 0 8        |
| 48  | Cast-iron frame and penstock, with 2-ft. diameter opening, with all lifting gear, screw-bolts, anchor-bolts, and gun-metal, complete  | 1               | 1 1 1 20             | 1 1 1 20        |
|   | Total weight  | ..              | ..                   | 26 11 3 10      |
| <b>GAS-CHECKS.</b>  |   |                 |                      |                 |
| 49  | Cast-iron frame, with muntz metal gas-check, for 6-ft. 10-in. by 5-ft. 10-in. sewer, with all screw-bolts, anchor-bolts, gun-metal work, complete   | 1               | 1 1 1 26             | 1 1 1 26        |
| 50  | Cast-iron frame, with muntz metal gas-check, for 6-ft. 8-in. by 5-ft. 8-in. sewer, with all screw-bolts, anchor-bolts, gun metal work, complete   | 1               | 0 19 2 17            | 0 19 2 17       |
| 51  | Cast iron frame, with muntz metal gas-check, for 5-ft. 6-in. by 4-ft. 6-in. sewer, with all screw-bolts, anchor-bolts, gun-metal work, complete   | 1               | 0 14 0 26            | 0 14 0 26       |
| 52  | Cast-iron frame, with muntz metal gas-check, for 5-ft. 2-in. by 4-ft. 2-in. sewer, with all screw-bolts, anchor-bolts, gun-metal work, complete   | 1               | 0 13 0 3             | 0 13 0 3        |
| 53  | Cast-iron frame, with muntz metal gas-check, for 5-ft. 1-in. by 4-ft. 1-in. sewer, with all screw-bolts, anchor-bolts, gun-metal work, complete   | 1               | 0 11 0 2             | 0 11 0 2        |
|   | Total weight  | ..              | ..                   | 3 19 1 18       |
| <b>IRREGULAR CASTINGS, &amp;c.</b>                              |   |                 |                      |                 |
| 54  | Flange and faucet pipe, 8 ft. long, 3-ft. 9 in. internal diameter   | 1               | 2 2 3 4              | 2 2 3 4         |
| 55  | Flange pipe, 8 ft. long, 3-ft. 9-in. internal diameter, one flange turned and drilled, for 1½-in. diameter bolt-holes   | 1               | 2 0 0 18             | 2 0 0 18        |
| 56  | Flange and spigot pipe, 9 ft. long, 3-ft. 9-in. internal diameter, the flanges to be turned and drilled for 1½ in. diameter bolt-holes  | 1               | 1 16 3 13            | 1 16 3 13       |
| 57  | Spigot pipe, 10 ft. long, 3 ft. 9-in. internal diameter   | 1               | 2 5 3 23             | 2 5 3 23        |
| 58  | Cast-iron thimble for 3-ft. 9-in. diameter pipe, 18 in. long  | 1               | 0 11 3 20            | 0 11 3 20       |
| 59  | Flange-pipe, 10 ft. long, 3-ft. 6-in. internal diameter, one flange turned and drilled, for 1½-in. diameter bolt-holes  | 2               | 2 6 1 1              | 4 12 2 2        |
| 60  | Flange and faucet pipe, 12 ft. long, 3-ft. 6-in. internal diameter  | 2               | 2 18 0 3             | 5 16 0 6        |
| 61  | Flange and spigot pipe, 10 ft. long, 3-ft. 6-in. internal diameter, the flange turned and drilled for 1½ in. diameter bolt-holes  | 2               | 2 4 3 1              | 4 9 2 2         |
| 62  | Spigot pipe, 10 ft. long, 3 ft. 6-in. internal diameter   | 1               | 2 2 3 25             | 2 2 3 25        |
| 63  | Spigot pipe, 6-ft. 6-in. long, 3-ft. 6-in. internal diameter  | 1               | 1 7 3 20             | 1 7 3 20        |
| 64  | Spigot and faucet pipe, 4-ft. 10-in. long, 3 ft. 6-in. internal diameter  | 1               | 1 5 2 24             | 1 5 2 24        |
| 65  | Cast-iron thimble for 3-ft. 6-in. diameter pipe, 18 in. long  | 2               | 0 10 1 7             | 1 0 2 14        |
| 66  | Flange and faucet pipe, 10 ft. long, 2 ft. internal diameter  | 1               | 0 19 0 4             | 0 19 0 4        |
| 67  | Flange and spigot pipe, 10 ft. long, 2 ft. internal diameter, the flange to be turned and drilled for 1½-in. diameter bolt-holes  | 2               | 0 16 3 23            | 1 13 3 18       |
| 68  | Cast-iron thimble for 2-ft. diameter pipe, 15 in. long  | 1               | 0 4 1 5              | 0 4 1 5         |
| 69  | Cast-iron flange bend, 12 in. internal diameter   | 4               | 0 3 2 7              | 0 14 1 0        |
| 70  | Cast-iron flange and spigot bend, 16 in. internal diameter  | 2               | 0 4 0 19             | 0 8 1 10        |
|   | Total weight  | ..              | ..                   | 33 12 3 12      |
| 71  | Wrought-iron rolled girders, 13½ in. high, top and bottom flange 5½ in. wide, 25 ft. long, to be walled in at Premier-street shaft chamber  | 2               | at 46 lb. per ft.    | 1 0 2 4         |
| 72  | Platform for working penstocks, Premier-street shaft, two wrought-iron rolled girders, 9 in. high, top and bottom flanges, 3 in. wide, 25 ft. long, weighing 19 lb. per lineal foot, with cast-iron gratings and wrought-iron standards and railings complete | ..              | ..                   | 1 4 2 15        |
| 73  | Cast-iron standards and wrought-iron tube-railing at top of shaft, and solid bar-railing across shaft at landings   | ..              | ..                   | 0 4 1 11        |
| 74  | Wrought-iron ladder in shaft, with supports, in four lengths, complete  | ..              | ..                   | 0 16 2 15       |
| 75  | Angle-iron bearers with cast-iron perforated landing-plates in shaft in Premier-street, complete  | 3               | ..                   | 0 15 2 27       |
| 76  | Wrought-iron hinged gratings on cast-iron hinge-plates and double wrought-iron channel girders, with cast-iron distance blocks for outlet well of syphon  | ..              | ..                   | 0 4 1 20        |
| 77  | Wrought-iron hinged grating for inlet well of syphon on cast-iron hinge-plates and double wrought-iron, channel-iron girders with cast-iron distance blocks   | ..              | ..                   | 0 9 1 11        |
|   | Total weight  | ..              | ..                   | 4 15 2 19       |
| <b>CAST-IRON STRAIGHT SPIGOT AND FAUCET PIPES, 12 FT. LONG.</b> |   |                 |                      |                 |
| 78  | 3-ft. 9-in. diameter syphon pipes   | 96              | 3 0 1 0              | 289 4 0 0       |
| 79  | 3-ft. 6-in. diameter duplicate sewer-pipes  | 154             | 2 16 2 3             | 435 5 0 14      |
| 80  | 2-ft. diameter scour-pipes  | 59              | 1 1 2 16             | 63 16 3 20      |
|   | Total weight of pipes   | ..              | ..                   | 788 6 0 6       |
| 81  | Screw-bolts 1½ in. diameter, with hexagon heads and nuts, for 3-ft. 9-in. and 3-ft. 6-in. diameters, flange pipe-joints   | 74              | ..                   | 0 2 0 23        |
| 82  | Screw-bolts 1 in. diameter, with hexagon heads and nuts, for 2-ft. diameter flange pipe-joints  | 15              | ..                   | 0 0 1 26        |
|   | Total weight  | ..              | ..                   | 0 2 2 21        |



## Appendix No. 53.

## No. 1.

Messrs. Carter &amp; Co. and Messrs. Gummow and Gillan to the President of Tender Board.

Sir,

Sydney, 10 June, 1891.

We have the honor to enter our protests against the acceptance of the tender of Messrs. Bond and Hudson for Contract No. 79, North Shore sewerage, on the following grounds:—

1. That the tender of Messrs. Bond and Hudson for Contract No. 56, Potts' Point sewerage, was accepted by your Board and not taken up by them.

2. Upon fresh tenders being called the tender of Mr. G. E. Hudson was the lowest, but was not accepted by the Board, in accordance with their rules and regulations.

Upon these grounds we, as tenderers for the North Shore sewerage, beg to protest against the tender of Messrs. Bond and Hudson being now accepted.

We have, &amp;c.,

GUMMOW AND GILLAN.  
CARTER & CO.

Let me have papers *re* Bond and Hudson's tender for Contract 56.—R.H., 10/6/91. Herewith.—J.C.P., 10/6/91.  
Mr. Hickson for report.—J.B., 10/6/91.

In January, 1890, C. S. Bond (afterwards Bond and Hudson) tendered for Sewerage Contract No. 56, at a ridiculously low figure, and, as anticipated, had to throw up the contract and forfeit deposit. They were the lowest again when fresh tenders were invited, but did not get the work, they being ineligible under the Tender Board Regulations, clause 14. The same firm now (some sixteen months later) are the lowest tenderers for Sewerage Contract 79, and it is contended by the writers of the within letter that their tender should not be accepted. I cannot recommend that this course be taken. It is true, under clause 14, they can be excluded from competing for other works at the pleasure of the President. But in all fairness there must be some limit (when no fraudulent action has taken place) to this prohibition; and it seems to me, after sixteen months, all bar to their tendering should be removed. In recommendation on face of tender.—R.H., 10/6/91. Under Sec.

Resubmit when we deal with the tenders.—J.B., 30/12/91.

## No. 2.

E. M. Clark, Esq., M.P., to the Secretary for Public Works.

Sir,

Parliament House, Sydney, 30 July, 1891.

I understand that tenders were accepted some time ago for the outfall sewerage to Long Bay, St. Leonards. The successful contractors were, I understand, Messrs. Bond and Hudson; and, as the work is a very urgent one, I think they should be compelled to go on with the work.

Trusting you will hurry the matter on.

I have, &amp;c.

EDWARD M. CLARK.

Resubmit with the tender, which I do not think has been accepted.—J.B., 3/8/91. Tenders for Contract No. 79 (91/1524) and all previous papers submitted, 13/7/91.—R.H., 3/8/91. All papers herewith.—D.C.M'L., 4/8/91. To stand over.—J.B., 7/7/91. Roads, B.C. Seen.—R.H., 8/9/91.

## No. 3.

E. M. Clark, Esq., M.P., to the Secretary for Public Works.

Sir,

Parliament House, Sydney, 18 August, 1891.

I shall be glad to know how far the matter of proceeding with the "outfall sewer to Middle Harbour," in my electorate, has progressed.

I might say I wrote you on the matter a fortnight ago.

Yours, &amp;c.

EDWARD M. CLARK.

91/1,991, and all previous papers, sent Under Secretary, 4/8/91. Tenders are awaiting acceptance; amount, £36,900, loan.—J.B., 19/8/91. Submitted.—J.D., 19/8/91. Inform must stand over until the question of further loan expenditure has been determined.—B.S., 21/8/91. Inform to-day.—J.B., 21/8/91. E. M. Clark, Esq., M.P., 21/8/91. Seen.—R.H., 24/8/91.

## No. 4.

Messrs. Bond and Hudson to The Secretary for Public Works.

*In re* Contract No. 79, Sydney Sewerage Works.

Dear Sir,

88, Sussex-street, Sydney, 28 September, 1891.

On the 10th June, of this year, we had the pleasure of submitting a tender for the above works, and we believe, were successful in being the lowest tenderers.

We have been anticipating the acceptance of our tender for some months, but not hearing from your Department, we have, in the meantime, entered upon other obligations, and must consequently respectfully ask you to permit us to withdraw our tender, and to return us the deposit attached thereto now lying in your hands, viz., £369.

We are, &amp;c.,

C. B. BOND,

(Bond and Hudson).

How does this matter stand?—D.C.M'L., 30/9/91. Messrs. Bond and Hudson's tender was recommended for acceptance on 10/6/91. Papers herewith.—F.C.P., 1/10/91. Return deposit.—J.B., 2/10/91. Accountant to return deposit, 2/10/91. I recommend that fresh tenders be invited.—R.H., 6/10/91. Under Secretary. Submitted.—J.B., 9/10/91. Approved.—W.J.L., 22/2/92. Insert notice, 22/2/92. Notice to *Gazette*, 22/2/92. Tenders for 9th March, 1892.

Since writing my minute of 6/10/91, complications have arisen with Carter & Co., *re* their Contract No. 72 having been stopped. They have made large claims on this account, some of which no doubt could not be entertained, but on some items they have made a good case. They are prepared, if they obtained this work, to waive all claims on No. 72. As their tender is a reasonable one, and some £3,600 below the estimate, I think it might fairly be accepted. If this course were adopted work would be given at once to a large number of men.—R.H., 23/2/92. Under Secretary. Important.

As Mr. Hickson thinks Messrs. Carter & Co. could make good a claim for something like £2,000 as compensation on Contract 72 (Munni-street, partly), should they be willing to forego this claim, their tender may be accepted for construction of the main outfall sewer, North Sydney—£39,890, as worked out at schedule rates. If this firm will not agree to the condition imposed, fresh tenders to be invited.—W.J.L., 23/2/92.

Mr. Hickson.—D.C.M'L., for U.S., B.C., 23/2/92. Please see me with Messrs. Carter & Co.—J.B., 23/2/92.  
Mr. Hickson.

## No. 5.

*Précis* of case up to return of Messrs. Bond and Hudson's deposit.

Department of Public Works, Roads and Bridges and Sewerage Branch,

Sydney, 29 January, 1892.

*Minute Paper.**Subject*:—North Shore Outfall Sewer, Contract No. 79, Sydney Sewerage Works.

TENDERS were received on the 10th June, 1891, for this work, that of Messrs. Bond and Hudson, at £37,254 10s., being the lowest. On the same date Messrs. Carter & Co. and Messrs. Gummow and Gillan conjointly wrote in protesting against the acceptance of Bond and Hudson's tender, as that firm had, on a previous occasion, thrown up a contract, but the protest was not allowed on account of the lapse of time, and as no fraudulent action had taken place, their tender was therefore recommended for acceptance.

On

On 28th September, 1891, Messrs. Bond and Hudson wrote in asking for the return of their deposit, and to be allowed to withdraw their tender owing to the delay in acceptance of same, and their having entered into other large engagements.

The deposit was returned accordingly on the 7th October, 1891.  
The Engineer-in-Chief for Sewerage.  
Seen.—R.H., 1/2/92. File.—R.H., 10/3/92.

F.E.P., 29/1/92.

No. 6.

The Chief Clerk to The Tender Board Clerk:

Department of Public Works, Sydney, 23 February, 1892.

*Minute Paper.**Subject*:—Main Outfall Sewer, North Sydney.

WITHDRAW notice inviting tenders for the above.

Done, 23/2/92. Put with the papers, 25/2/92.

No. 7.

The Under Secretary for Public Works to Messrs. Carter &amp; Co.

Department of Public Works, Sydney, 10 March, 1892.

Sirs,

I have the honor, by direction of the Secretary for Public Works, to inform you that your tender, dated 10th June last, is accepted for construction of the North Shore Main Outfall Sewer, from near Long Bay to Mount-street—Contract No. 79, Sydney Sewerage—at your schedule of prices.

The work is to be carried out in strict accordance with the several contract exhibits relating to this contract, and to be completed within twenty-four months from this date.

I have to refer you to the Commissioner for Roads for further information, and to request that you will call upon the officer in charge of bonds and contracts at this office, for the purpose of executing the necessary documents for the due observance of your contract.

I am, &amp;c.,

J. BARLING,

Under Secretary.

## Appendix No. 54.

CONTRACT No. 72.—Schedule of quantities and prices for constructing and completing concrete and stoneware pipe storm-water sewer, from Munni-street along Macdonald-street to Mitchell Road and Shea's Creek, with manholes, flushing chambers, junctions, &c., subject to omissions, additions, deviations, or alterations, as provided. The quantities in this schedule are not guaranteed as correct, but are merely given for the guidance of intending contractors, this being a schedule of prices contract.

| No. of Item. | Description of Works.   | Unit.       | Probable quantity. | Rate per unit. | Amount.     |
|--------------|---|-------------|--------------------|----------------|-------------|
| 1            | General excavation in open trenches for sewers, junctions, curves, manholes, pipe-drains, &c., including grubbing, clearing, timbering, unwatering, road restoring, coffer-dam, removing of old stone abutments and timber-decking of existing road bridge, depositing the excavated materials beyond actual site of works in separate spoil-banks, complete, as specified in clauses 34 to 36, and 37 to 54, inclusive .....   | cubic yard  | 26,200             | 2/6            | £ 3,275 0 0 |
| 2            | Filling in below, at sides, and over sewers, junctions, curves, manholes, into abandoned open channels, road embankment, &c., including the providing of quarry filling, lead from sites of excavations or temporary spoil-banks, or any other sources outside the limits of this contract, to the place of permanent deposit, breaking, road restoring, ramming, watering, leading surplus and rejected material to spoil, as specified in clauses 47, 50, 51, 53 to 62, inclusive ..... | "           | 12,000             | 1/-            | 600 0 0     |
| 3            | Sodding at both sides of new channels, and where ordered, complete, as specified in clause 63 .....   | squareyard  | 1,000              | 1/-            | 50 0 0      |
| 4            | Brickwork, any thickness, shape, arched, &c., where ordered, in any situation, as specified in clauses 96 to 99 .....   | cubic yard  | 110                | 80/-           | 440 0 0     |
| 5            | Sandstone concrete, any shape, form, thickness, arched, &c., where ordered, in any situation, as specified in clauses 73 to 95 inclusive .....  | "           | 8,100              | 34/-           | 13,770 0 0  |
| 6            | Cement facing $\frac{3}{4}$ inch thick, where ordered, in any situation, as specified in clause 112 .....   | squareyard  | 11,600             | 2/6            | 1,450 0 0   |
|              | Providing, laying, and joining glazed stoneware plain pipes, in trenches, and where ordered, including fixed discs, as specified in clauses 16, 40-42, 44, and 73 to 77:—   |             |                    |                |             |
| 7            | 24 inches internal diameter .....   | lineal foot | 250                | 15/-           | 187 10 0    |
| 8            | 21 " " " .....  | "           | 20                 | 12/-           | 12 0 0      |
| 9            | 18 " " " .....  | "           | 550                | 7/-            | 192 10 0    |
| 10           | 12 " " " .....  | "           | 20                 | 5/-            | 5 0 0       |
| 11           | 9 " " " .....   | "           | 20                 | 3/-            | 3 0 0       |
| 12           | 6 " " " .....   | "           | 20                 | 2/-            | 2 0 0       |
| 13           | Less than 6 in. " .....   | "           | 20                 | 2/-            | 2 0 0       |
| 14           | Providing and fixing in position hardwood timber in piles, walings, sheet piling, including ironwork, as specified in clause 71 .....   | cubic foot  | 600                | 4/-            | 120 0 0     |
| 15           | Providing and fixing in position hardwood timber in platform, including ironwork as specified in clause 70, where ordered.....  | "           | 600                | 3/-            | 90 0 0      |
| 16           | Timber, ordered in writing, to be left in excavations, as specified in clause 43, including all iron used in fixing same .....  | "           | 600                | -/6            | 15 0 0      |
| 17           | Sandstone pitchers, laid where ordered, as specified in clause 114.....   | squareyard  | 40                 | 15/-           | 30 0 0      |
|              | <b>IRONWORK.</b>  |             |                    |                |             |
| 18           | Providing, delivering, and fixing in position girders, including bedding same on special mortar, as specified in clauses 91 and 102 to 107 .....  | cwt.        | 74 cwt. 22 lb.     | 25/-           | 92 14 11    |
| 19           | Providing, delivering, and fixing cast-iron gratings, as specified and shown on drawing No. 5, weighing 4 cwt. each, as specified in clauses 90 and 108 to 111 .....  | each        | 32                 | 90/-           | 144 0 0     |
| 20           | Cast-iron ventilating grates, with square frames, 22 inches diameter, internal opening, tarred sawn hardwood bricks in centre, fitted into panels, circular dirt-box 8 inches deep, complete, as shown on drawing No. 5, and as specified in clauses 90 and 108 to 111, placed in position, weighing each about 9 cwt. ....   | "           | 6                  | 200/-          | 60 0 0      |

| No. of Item.        | Description of Works.  | Unit.      | Probable quantity. | Rate per unit. | Amount.           |
|---------------------|--|------------|--------------------|----------------|-------------------|
| <b>GENERAL.</b>     |  |            |                    |                | £ s. d.           |
| 21                  | Special bluestone concrete (clause 26), where ordered in any situation, in the construction of these works .....   | cubic yard | 5                  | 60/-           | 15 0 0            |
| 22                  | Permanent puddle, where ordered in any situation, in the construction of these works (temporary puddle ordered for purposes of execution of work not to be paid for) ..... | "          | 5                  | 2/6            | 0 12 6            |
| 23                  | Bluestone metal (clause 19), 1½-inch gauge, stacked .....  | "          | 5                  | 15/-           | 3 15 0            |
| 24                  | Bluestone metal (clause 31), 2½-inch gauge, stacked .....  | "          | 5                  | 14/-           | 3 10 0            |
| 25                  | Sharp, clean-washed sand, stacked .....  | "          | 5                  | 4/-            | 1 0 0             |
| 26                  | Oregon timber, in scantlings or planks .....   | cubic foot | 100                | 2/-            | 10 0 0            |
| 27                  | Wrought-iron in bolts, screws, nails, spikes, and galvanised step-irons .....  | lb.        | 1,000              | -/6            | 25 0 0            |
| 28                  | Portland cement .....  | cask       | 5                  | 20/-           | 5 0 0             |
| 29                  | Artisan or mechanic, supplied by contractor .....  | day        | 10                 | 15/-           | 7 10 0            |
| 30                  | Quarryman or other skilled labourer, supplied by contractor .....  | "          | 10                 | 10/-           | 5 0 0             |
| 31                  | Ordinary labourer, supplied by contractor .....  | "          | 10                 | 10/-           | 5 0 0             |
| 32                  | Cart, with one horse and driver, supplied by contractor .....  | "          | 5                  | 20/-           | 5 0 0             |
| 33                  | One additional horse, supplied by contractor .....   | "          | 5                  | 10/-           | 2 10 0            |
| <b>MAINTENANCE.</b> |  |            |                    |                |                   |
| 34                  | Three months' maintenance after formal delivery of works .....   | lump sum   | .....              | ...            | 20 7 7            |
| <b>TOTAL</b> .....  |  |            |                    |                | <b>20,650 0 0</b> |

## FINAL CERTIFICATE.

CONTRACT No. 72.—Final Return showing quantity and value of Work executed or fixed on the 23rd day of September, 1892.

| Schedule Rate No.       | Description.                                  | Unit.       | Quantity. | Rate. | Amount.            | Total.  |
|-------------------------|---|-------------|-----------|-------|--------------------|---------|
| 1                       | General excavation .....                      | cubic yard  | 53,410.24 | 2/6   | £ 6,676 5 7        | £ s. d. |
| 2                       | Filling .....                                 | "           | 27,961.11 | 1/-   | 1,398 1 1          |         |
| 3                       | Sodding .....                                 | square yard | 11        | 1/-   | 0 11 0             |         |
| 4                       | Brickwork .....                               | cubic yard  | 32.30     | 80/-  | 129 4 0            |         |
| 5                       | Sandstone concrete .....                      | "           | 8,372.31  | 34/-  | 14,232 18 6        |         |
| 6                       | Cement facing .....                           | square yard | 12,324.79 | 2/6   | 1,540 12 0         |         |
| 7                       | Earthenware pipes, 24 in. diameter .....      | lineal foot | 58        | 15/-  | 43 10 0            |         |
| 9                       | " 18 in. " .....                              | "           | 349       | 7/-   | 122 3 0            |         |
| 10                      | " 12 in. " .....                              | "           | 4         | 5/-   | 1 0 0              |         |
| 11                      | " 9 in. " .....                               | "           | 2         | 3/-   | 0 6 0              |         |
| 12                      | " 6 in. " .....                               | "           | 357       | 2/-   | 35 14 0            |         |
| 14                      | Hardwood timber .....                         | cubic foot  | 902.92    | 4/-   | 180 11 8           |         |
| 16                      | Timber left in excavation .....               | "           | 336.93    | -/6   | 8 8 5              |         |
| 17                      | Sandstone pitchers .....                      | square yard | 13.58     | 15/-  | 10 3 8             |         |
| 18                      | Cast-iron girders .....                       | cwt.        | 400.33    | 25/-  | 500 8 3            |         |
| 19                      | " gratings .....                              | number      | 15        | 90/-  | 67 10 0            |         |
| 20                      | Manhole covers .....                          | "           | 11        | 200/- | 110 0 0            |         |
| 22                      | Permanent puddle .....                        | cubic yard  | 9         | 2/6   | 1 2 6              |         |
| 26                      | Oregon timber .....                           | cubic foot  | 6.5       | 2/-   | 0 13 0             |         |
| 27                      | Wrought ironwork .....                        | lb.         | 2,301.31  | -/6   | 57 10 8            |         |
| 28                      | Portland cement .....                         | cask        | 2         | 20/-  | 2 0 0              |         |
| 29                      | Mechanic .....                                | day         | 2         | 15/-  | 1 10 0             |         |
| 31                      | Ordinary labourer .....                       | "           | 92        | 10/-  | 46 0 0             |         |
| 32                      | Cart, horse, and driver .....                 | "           | 2.50      | 20/-  | 2 10 0             |         |
| 33                      | Additional horse .....                        | "           | ½         | 10/-  | 0 5 0              |         |
| 34                      | Three months maintenance .....                | lump sum    | .....     | ..... | 20 7 7             |         |
| <i>Not in Schedule.</i> |   |             |           |       |                    |         |
|                         | 18-in. earthenware pipes (bends) .....        | lineal foot | 6         | 9/5½  | 2 16 9             |         |
|                         | Sandstone, ashlar .....                       | cubic foot  | 480.47    | 1/6   | 36 0 8             |         |
|                         | Fixing girders .....                          | cwt.        | 10.70     | 5/-   | 2 13 6             |         |
|                         | Connecting Messrs. Green and Son's mill ..... | .....       | .....     | ..... | 6 12 6             |         |
|                         | Cast-iron gratings .....                      | number      | 11        | 50/-  | 27 10 0            |         |
| <b>Total</b> .....      |   |             |           |       | <b>25,264 19 4</b> |         |

| Recapitulation.                                | Amount.                | Total.                 |
|--|------------------------|------------------------|
| Value of work executed .....                   | £ s. d.<br>25,264 19 4 | £ s. d.<br>25,264 19 4 |
| <i>Deductions to be Made:—</i>                 |                        |                        |
| Amount of progress payments already made ..... | .....                  | 24,448 1 9             |
| Amount of final payment now recommended .....  | .....                  | 816 17 7               |

We hereby certify that the above return is a fair and correct statement of the contract to which it refers, and that the above measurements were made by the Resident Engineer with Mr. Snodgrass.

STEPHEN H. WEEDON,  
Resident Engineer, Contract No. 72.

J. DAVIS,  
Supervising Engineer.

Amount of contract .....

£29,650

Actual amount of payments, including present advance .....

£25,264 19s. 4d.

Contractor's name—CARTER & CO,

I,

I hereby certify that I examined the work generally and found it in accordance with specifications, and have checked the quantities with the plans, and that they generally agree with same, and that rates are correct.

C. H. OHLFSEN-BAGGÉ,  
Chief Assistant Engineer.

I certify that the amount charged in this voucher as to computations, castings, and rates is correct, that the service has been faithfully performed, and that the expenditure is duly authorised in terms of the Audit Act.

ROBT. HICKSON,  
Head of the Department.

Received on the \_\_\_\_\_ day of \_\_\_\_\_ 189\_\_\_\_, the sum of eight hundred and sixteen pounds seventeen shillings and seven pence, sterling, in full payment for the whole of the works mentioned in the above account, the quantities stated having been finally agreed upon, and settled to be the whole of the work done and materials provided, for which payment is to be made in respect of the Contract for Munni-street to Shea's Creek, S.W. Sewer, Ct. 72, and all extra works in connection with the said Contract, and we declare that the sum hereby acknowledged to be received by us includes the percentages retained until the final completion of the work, and is in full payment and satisfaction of all our claims for or in respect of, or arising out of, our Contract for the said work, and for everything in connection therewith, in respect whereof we have any claim whatsoever.  
(Witness)

Appendix No. 55.

CONTRACT No. 79A.—Return of Cement used, taken from Inspectors' Daily Reports.

| Date.       | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspector making returns. | Date.       | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspector making returns. |
|-------------|---------------------------|----------------------------|----------------------------|---------------------------|-------------|---------------------------|----------------------------|----------------------------|---------------------------|
| 1894.       |                           |                            |                            |                           | 1895.       |                           |                            |                            |                           |
| 17 Oct. ... | 2                         | .....                      | .....                      | J. Parsons.               | 23 January  | .....                     | 5                          | .....                      | G. A. Fowle.              |
| 18 " ...    | 2                         | .....                      | .....                      | "                         | 29 " ...    | 4 $\frac{3}{4}$           | 1 $\frac{1}{2}$            | .....                      | "                         |
| 22 " ...    | 8                         | .....                      | .....                      | "                         | 4 Feb. ...  | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 23 " ...    | 8                         | .....                      | .....                      | "                         | 5 " ...     | .....                     | 1                          | .....                      | "                         |
| 24 " ...    | 8                         | .....                      | .....                      | "                         | 6 " ...     | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 25 " ...    | 7                         | .....                      | .....                      | "                         | 26 " ...    | .....                     | 1 $\frac{1}{4}$            | .....                      | "                         |
| 26 " ...    | 8                         | .....                      | .....                      | "                         | 27 " ...    | .....                     | 1                          | .....                      | "                         |
| 27 " ...    | 2                         | .....                      | .....                      | "                         | 28 " ...    | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 29 " ...    | 10                        | .....                      | .....                      | "                         | 1 March...  | 3 $\frac{1}{2}$           | .....                      | .....                      | "                         |
| 30 " ...    | 11                        | .....                      | .....                      | "                         | 2 " ...     | 3                         | .....                      | .....                      | "                         |
| 31 " ...    | 9                         | .....                      | .....                      | "                         | 4 " ...     | 2 $\frac{1}{2}$           | .....                      | .....                      | "                         |
| 1 Nov. ...  | 3                         | .....                      | .....                      | "                         | 7 " ...     | 9                         | .....                      | .....                      | "                         |
| 6 " ...     | 2                         | 5                          | .....                      | "                         | 8 " ...     | 3                         | .....                      | .....                      | "                         |
| 7 " ...     | 2                         | 5                          | .....                      | "                         | 9 " ...     | 2                         | .....                      | .....                      | "                         |
| 8 " ...     | .....                     | 3                          | .....                      | "                         | 11 " ...    | 12                        | .....                      | .....                      | "                         |
| 10 " ...    | .....                     | 2                          | .....                      | "                         | 12 " ...    | 10                        | .....                      | .....                      | "                         |
| 12 " ...    | .....                     | 3                          | .....                      | "                         | 13 " ...    | 7                         | .....                      | .....                      | "                         |
| 13 " ...    | 7                         | 4                          | .....                      | "                         | 14 " ...    | 3                         | .....                      | .....                      | "                         |
| 14 " ...    | 11                        | 3                          | .....                      | "                         | 15 " ...    | 4                         | .....                      | .....                      | "                         |
| 15 " ...    | 13                        | 2                          | .....                      | "                         | 16 " ...    | 4                         | .....                      | .....                      | "                         |
| 16 " ...    | 13                        | 2                          | .....                      | "                         | 18 " ...    | 8                         | .....                      | .....                      | "                         |
| 17 " ...    | 8                         | 1                          | .....                      | "                         | 19 " ...    | 12                        | .....                      | .....                      | "                         |
| 19 " ...    | 5                         | 2                          | .....                      | "                         | 20 " ...    | 13                        | .....                      | .....                      | "                         |
| 20 " ...    | 11                        | 1                          | .....                      | "                         | 21 " ...    | 10                        | .....                      | .....                      | "                         |
| 21 " ...    | 1                         | .....                      | .....                      | "                         | 22 " ...    | 11                        | .....                      | .....                      | "                         |
| 22 " ...    | 5                         | 2                          | 1 $\frac{1}{2}$            | "                         | 23 " ...    | 7                         | .....                      | .....                      | "                         |
| 23 " ...    | .....                     | 3                          | 1 $\frac{1}{2}$            | "                         | 25 " ...    | 11                        | .....                      | .....                      | "                         |
| 24 " ...    | .....                     | 1                          | 1                          | "                         | 26 " ...    | 14                        | .....                      | .....                      | "                         |
| 26 " ...    | 8                         | 4                          | 2                          | "                         | 27 " ...    | 10                        | .....                      | .....                      | "                         |
| 27 " ...    | 8                         | 5                          | 1 $\frac{1}{2}$            | "                         | 28 " ...    | 12                        | 2                          | .....                      | "                         |
| 28 " ...    | 11                        | 3                          | 1                          | "                         | 29 " ...    | 18                        | 3                          | .....                      | "                         |
| 29 " ...    | 12 $\frac{3}{4}$          | 2                          | 1 $\frac{1}{2}$            | "                         | 30 " ...    | 6                         | 1                          | .....                      | "                         |
| 30 " ...    | 8                         | 1 $\frac{1}{2}$            | 1                          | "                         | 1 April ... | 3                         | 2                          | .....                      | "                         |
| 1 Dec. ...  | 9                         | 1                          | 1 $\frac{1}{2}$            | "                         | 2 " ...     | 11                        | 4                          | .....                      | "                         |
| 3 " ...     | 8                         | 4                          | 1                          | "                         | 5 " ...     | 5                         | 4                          | .....                      | "                         |
| 4 " ...     | .....                     | 2 $\frac{1}{2}$            | 1 $\frac{1}{2}$            | "                         | 3 " ...     | 14                        | 3                          | .....                      | "                         |
| 5 " ...     | .....                     | 2 $\frac{1}{2}$            | 1 $\frac{1}{2}$            | "                         | 4 " ...     | 11                        | 4                          | .....                      | "                         |
| 6 " ...     | 9                         | 1                          | 1 $\frac{1}{2}$            | "                         | 5 " ...     | 5                         | 4                          | .....                      | "                         |
| 7 " ...     | 5 $\frac{1}{2}$           | 2                          | 1                          | "                         | 6 " ...     | 5                         | 3                          | .....                      | "                         |
| 8 " ...     | .....                     | 2                          | 1 $\frac{1}{2}$            | "                         | 8 " ...     | 2                         | 4                          | .....                      | "                         |
| 10 " ...    | .....                     | 3                          | 1 $\frac{1}{2}$            | "                         | 9 " ...     | 3                         | 4                          | .....                      | "                         |
| 11 " ...    | 5                         | 3                          | 1                          | "                         | 10 " ...    | 11                        | 5                          | .....                      | "                         |
| 12 " ...    | 8                         | 2 $\frac{1}{2}$            | 1 $\frac{1}{2}$            | "                         | 11 " ...    | 18                        | 4                          | .....                      | "                         |
| 13 " ...    | 9                         | 3                          | .....                      | "                         | 16 " ...    | 6                         | 3                          | .....                      | "                         |
| 14 " ...    | 6 $\frac{3}{4}$           | 2 $\frac{1}{4}$            | .....                      | "                         | 17 " ...    | 4                         | 4                          | .....                      | "                         |
| 15 " ...    | .....                     | 2                          | .....                      | "                         | 18 " ...    | .....                     | 4                          | .....                      | "                         |
| 17 " ...    | 1                         | .....                      | 1                          | "                         | 19 " ...    | 14                        | 4                          | .....                      | "                         |
| 18 " ...    | 1                         | .....                      | 1 $\frac{1}{2}$            | "                         | 20 " ...    | 11                        | 3                          | .....                      | "                         |
| 19 " ...    | .....                     | .....                      | 1 $\frac{3}{4}$            | "                         | 22 " ...    | 13                        | 3                          | .....                      | "                         |
| 20 " ...    | .....                     | .....                      | 2 $\frac{3}{4}$            | "                         | 23 " ...    | 14                        | 3                          | .....                      | "                         |
| 21 " ...    | .....                     | .....                      | 1 $\frac{3}{4}$            | "                         | 24 " ...    | 10                        | 3                          | .....                      | "                         |
| 22 " ...    | .....                     | .....                      | 1 $\frac{1}{4}$            | "                         | 25 " ...    | .....                     | 3                          | .....                      | "                         |
| 1895.       |                           |                            |                            |                           | 26 " ...    | .....                     | 2                          | .....                      | "                         |
| 2 January   | .....                     | .....                      | .....                      | A. Inwood.                | 27 " ...    | 7                         | 2                          | .....                      | "                         |
| 3 " ...     | 1 $\frac{1}{2}$           | 1 $\frac{3}{4}$            | 1 $\frac{3}{4}$            | G. A. Fowle.              | 29 " ...    | 6                         | 2                          | .....                      | "                         |
| 4 " ...     | 1 $\frac{3}{4}$           | 1                          | 2                          | "                         | 30 " ...    | 2                         | 2                          | .....                      | "                         |
| 5 " ...     | 1 $\frac{1}{2}$           | .....                      | 1 $\frac{1}{2}$            | "                         | 1 May ...   | 12                        | 2                          | .....                      | "                         |
| 9 " ...     | 5                         | .....                      | .....                      | "                         | 2 " ...     | 14                        | 3                          | .....                      | "                         |
| 12 " ...    | 3                         | .....                      | .....                      | "                         | 3 " ...     | 19                        | 3                          | .....                      | "                         |
| 14 " ...    | 7 $\frac{1}{2}$           | .....                      | .....                      | "                         | 4 " ...     | 10                        | 3                          | .....                      | "                         |
| 17 " ...    | .....                     | .....                      | .....                      | "                         | 6 " ...     | 13                        | 4                          | .....                      | "                         |
| 24 " ...    | .....                     | 1                          | .....                      | "                         | 7 " ...     | 12                        | 4                          | .....                      | "                         |
| 25 " ...    | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         | 8 " ...     | 18                        | 4                          | .....                      | "                         |

| Date.    | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors making returns. | Date.     | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspector making returns. |
|----------|---------------------------|----------------------------|----------------------------|----------------------------|-----------|---------------------------|----------------------------|----------------------------|---------------------------|
| 1895.    |                           |                            |                            |                            | 1895.     |                           |                            |                            |                           |
| 9 May    | 15                        | 4                          | .....                      | G. A. Fowle.               | 26 August | 13                        | 1 $\frac{1}{2}$            | 1 $\frac{1}{2}$            | G. Andrew.                |
| 10 "     | .....                     | 5                          | .....                      | "                          | 27 "      | 14                        | 1                          | 1 $\frac{1}{2}$            | "                         |
| 11 "     | 8                         | 3                          | .....                      | "                          | 28 "      | 15                        | 1 $\frac{3}{4}$            | 1 $\frac{1}{2}$            | "                         |
| 13 "     | 12                        | 4                          | .....                      | "                          | 29 "      | 16                        | 1                          | 1 $\frac{1}{2}$            | "                         |
| 14 "     | 8                         | 5                          | .....                      | "                          | 30 "      | 4                         | 1                          | 1 $\frac{1}{2}$            | "                         |
| 15 "     | 16                        | 4                          | .....                      | "                          | 31 "      | 7                         | 1 $\frac{3}{4}$            | 1 $\frac{1}{2}$            | "                         |
| 16 "     | 19                        | 2                          | .....                      | "                          | 2 Sept.   | 11                        | 1 $\frac{3}{4}$            | 1 $\frac{1}{2}$            | "                         |
| 17 "     | 18                        | 2                          | .....                      | "                          | 3 "       | 13                        | 1 $\frac{1}{2}$            | .....                      | "                         |
| 18 "     | 10                        | 1                          | .....                      | "                          | 4 "       | 12                        | .....                      | .....                      | "                         |
| 20 "     | .....                     | 1                          | .....                      | "                          | 5 "       | 14                        | .....                      | 1 $\frac{1}{2}$            | "                         |
| 21 "     | 5                         | 3                          | .....                      | "                          | 6 "       | 16                        | .....                      | 1 $\frac{1}{2}$            | "                         |
| 22 "     | .....                     | 4                          | .....                      | "                          | 7 "       | 7                         | .....                      | 1 $\frac{1}{2}$            | "                         |
| 23 "     | .....                     | 4                          | .....                      | "                          | 9 "       | .....                     | .....                      | 1 $\frac{1}{2}$            | "                         |
| 27 "     | .....                     | 5                          | .....                      | "                          | 10 "      | 2                         | .....                      | 1 $\frac{1}{2}$            | "                         |
| 28 "     | .....                     | 5                          | .....                      | "                          | 11 "      | .....                     | 1                          | 1 $\frac{1}{2}$            | "                         |
| 29 "     | .....                     | 5                          | 1                          | "                          | 12 "      | 3                         | 3 $\frac{1}{4}$            | 1 $\frac{1}{2}$            | "                         |
| 30 "     | .....                     | 4                          | 1                          | "                          | 13 "      | .....                     | 6                          | 1 $\frac{1}{2}$            | "                         |
| 31 "     | 10                        | 4                          | 1                          | "                          | 14 "      | 6                         | 3                          | 1 $\frac{1}{2}$            | "                         |
| 1 June   | .....                     | 3                          | 1                          | "                          | 16 "      | 13                        | 5                          | .....                      | "                         |
| 3 "      | .....                     | 3                          | 1                          | "                          | 17 "      | 13                        | 2 $\frac{1}{2}$            | .....                      | "                         |
| 4 "      | .....                     | 3                          | 1                          | "                          | 18 "      | 13                        | 3                          | 1 $\frac{1}{2}$            | "                         |
| 5 "      | .....                     | 3                          | 1                          | "                          | 19 "      | 12                        | 2 $\frac{1}{4}$            | 1 $\frac{1}{2}$            | "                         |
| 6 "      | .....                     | 3                          | 1                          | "                          | 20 "      | 23                        | 2                          | 1 $\frac{1}{2}$            | "                         |
| 7 "      | .....                     | 2                          | 1                          | "                          | 21 "      | 7                         | 1 $\frac{1}{2}$            | 1 $\frac{1}{2}$            | "                         |
| 8 "      | .....                     | 2                          | 1                          | "                          | 23 "      | 12                        | 2 $\frac{1}{2}$            | .....                      | "                         |
| 10 "     | .....                     | 2                          | 3                          | "                          | 24 "      | 7                         | .....                      | .....                      | "                         |
| 11 "     | .....                     | 2                          | 4                          | "                          | 25 "      | 11                        | .....                      | .....                      | "                         |
| 12 "     | 2                         | 2                          | 4                          | "                          | 26 "      | 5                         | .....                      | .....                      | "                         |
| 13 "     | 9 $\frac{1}{2}$           | 1 $\frac{1}{2}$            | 4                          | "                          | 30 "      | 11                        | .....                      | .....                      | "                         |
| 14 "     | 6                         | 1                          | 3                          | "                          | 1 Oct.    | 13                        | .....                      | .....                      | "                         |
| 15 "     | 6                         | 1                          | 1                          | "                          | 2 "       | 7                         | .....                      | .....                      | "                         |
| 17 "     | .....                     | 2                          | 2                          | "                          | 3 "       | 13                        | .....                      | .....                      | "                         |
| 18 "     | .....                     | 3                          | 2                          | "                          | 5 "       | .....                     | .....                      | .....                      | "                         |
| 19 "     | .....                     | 3                          | 3                          | "                          | 8 "       | .....                     | .....                      | .....                      | "                         |
| 20 "     | 6                         | 2                          | 3                          | "                          | 9 "       | .....                     | .....                      | .....                      | "                         |
| 21 "     | 5                         | 3                          | 3                          | "                          | 10 "      | .....                     | .....                      | .....                      | "                         |
| 22 "     | 3                         | 2                          | 3                          | "                          | 11 "      | 2                         | .....                      | .....                      | "                         |
| 24 "     | 3                         | 2                          | 4                          | "                          | 12 "      | 8                         | .....                      | .....                      | "                         |
| 25 "     | 2                         | 3                          | 3                          | "                          | 14 "      | .....                     | .....                      | .....                      | "                         |
| 26 "     | 8                         | 4                          | 2                          | "                          | 15 "      | .....                     | .....                      | .....                      | "                         |
| 27 "     | 10                        | 4                          | 2                          | "                          | 16 "      | .....                     | .....                      | .....                      | "                         |
| 28 "     | 14                        | 4                          | 2                          | "                          | 17 "      | .....                     | .....                      | .....                      | "                         |
| 29 "     | 5                         | 3                          | 1                          | "                          | 18 "      | .....                     | .....                      | .....                      | "                         |
| 1 July   | 12                        | 4                          | 1                          | "                          | 19 "      | .....                     | .....                      | .....                      | "                         |
| 2 "      | 2                         | 4                          | 1                          | "                          | 21 "      | .....                     | 1                          | .....                      | "                         |
| 3 "      | .....                     | 2                          | 2                          | "                          | 22 "      | .....                     | .....                      | .....                      | "                         |
| 4 "      | 7                         | 4                          | .....                      | "                          | 23 "      | .....                     | .....                      | .....                      | "                         |
| 5 "      | 10                        | 2                          | .....                      | "                          | 24 "      | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 6 "      | .....                     | 1                          | .....                      | "                          | 25 "      | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 8 "      | 5                         | 2                          | .....                      | "                          | 26 "      | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 9 "      | .....                     | 4 $\frac{1}{2}$            | .....                      | G. Andrew.                 | 28 "      | .....                     | 2 $\frac{1}{2}$            | .....                      | "                         |
| 10 "     | .....                     | 4 $\frac{1}{2}$            | .....                      | "                          | 29 "      | .....                     | 3                          | .....                      | "                         |
| 11 "     | 6                         | 4                          | .....                      | "                          | 30 "      | .....                     | 2 $\frac{1}{2}$            | .....                      | "                         |
| 12 "     | 3 $\frac{1}{2}$           | 3                          | .....                      | "                          | 31 "      | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 13 "     | .....                     | 1                          | .....                      | "                          | 1 Nov.    | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 15 "     | .....                     | 3 $\frac{1}{2}$            | .....                      | "                          | 2 "       | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 16 "     | .....                     | 4 $\frac{1}{2}$            | .....                      | "                          | 4 "       | .....                     | 2                          | .....                      | "                         |
| 17 "     | .....                     | 5 $\frac{1}{2}$            | .....                      | "                          | 5 "       | .....                     | 2 $\frac{1}{2}$            | .....                      | "                         |
| 18 "     | .....                     | 4                          | 1                          | "                          | 6 "       | .....                     | 2                          | .....                      | "                         |
| 19 "     | .....                     | 1                          | .....                      | "                          | 7 "       | .....                     | 2 $\frac{1}{2}$            | .....                      | "                         |
| 20 "     | .....                     | 1                          | .....                      | "                          | 8 "       | .....                     | 3 $\frac{1}{2}$            | .....                      | "                         |
| 22 "     | .....                     | 1                          | 2                          | "                          | 11 "      | .....                     | 4                          | .....                      | "                         |
| 23 "     | .....                     | 1                          | 2                          | "                          | 12 "      | .....                     | 4                          | .....                      | "                         |
| 25 "     | .....                     | 1                          | 1                          | "                          | 13 "      | .....                     | 3 $\frac{1}{2}$            | .....                      | "                         |
| 26 "     | .....                     | 1                          | 2                          | "                          | 14 "      | 4                         | 3                          | .....                      | "                         |
| 27 "     | .....                     | 1                          | 1                          | "                          | 15 "      | 4                         | 2                          | .....                      | "                         |
| 29 "     | .....                     | 1                          | 1                          | "                          | 16 "      | .....                     | 1                          | .....                      | "                         |
| 30 "     | .....                     | 1                          | 1 $\frac{1}{2}$            | "                          | 18 "      | .....                     | 2                          | .....                      | "                         |
| 31 "     | 2                         | .....                      | 1                          | "                          | 19 "      | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 1 August | 3                         | .....                      | 3 $\frac{1}{2}$            | "                          | 20 "      | .....                     | 2 $\frac{1}{2}$            | .....                      | "                         |
| 2 "      | .....                     | .....                      | 2                          | "                          | 21 "      | .....                     | 2 $\frac{1}{2}$            | .....                      | "                         |
| 3 "      | 4                         | .....                      | 1 $\frac{1}{2}$            | "                          | 22 "      | .....                     | 2 $\frac{1}{2}$            | .....                      | "                         |
| 5 "      | 10                        | .....                      | 2                          | "                          | 23 "      | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 6 "      | 4 $\frac{1}{2}$           | 2 $\frac{1}{2}$            | 2                          | "                          | 25 "      | .....                     | 3 $\frac{1}{2}$            | .....                      | "                         |
| 7 "      | 9                         | .....                      | 1 $\frac{1}{2}$            | "                          | 26 "      | .....                     | 2                          | .....                      | "                         |
| 8 "      | 12                        | .....                      | 1 $\frac{1}{2}$            | "                          | 27 "      | .....                     | 2 $\frac{1}{2}$            | .....                      | "                         |
| 9 "      | .....                     | 1                          | 1                          | "                          | 28 "      | .....                     | 2                          | .....                      | "                         |
| 10 "     | .....                     | 1                          | 1                          | "                          | 29 "      | .....                     | 2 $\frac{1}{2}$            | .....                      | "                         |
| 12 "     | 4                         | 1                          | 1                          | "                          | 30 "      | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 13 "     | 2 $\frac{1}{2}$           | 1                          | 1                          | "                          | 2 Dec.    | .....                     | 2 $\frac{1}{2}$            | .....                      | "                         |
| 14 "     | .....                     | 1                          | 1                          | "                          | 3 "       | .....                     | 2                          | .....                      | "                         |
| 15 "     | .....                     | 1                          | .....                      | "                          | 4 "       | .....                     | 2                          | .....                      | "                         |
| 16 "     | .....                     | .....                      | .....                      | "                          | 5 "       | .....                     | 1                          | .....                      | "                         |
| 17 "     | .....                     | .....                      | .....                      | "                          | 6 "       | 11                        | 1                          | 1                          | "                         |
| 19 "     | .....                     | 1 $\frac{1}{2}$            | .....                      | "                          | 7 "       | 2                         | .....                      | .....                      | "                         |
| 20 "     | .....                     | 1 $\frac{1}{2}$            | .....                      | "                          | 9 "       | 3                         | 1                          | 1 $\frac{1}{2}$            | "                         |
| 21 "     | 2                         | 1                          | .....                      | "                          | 10 "      | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 22 "     | .....                     | 1                          | .....                      | "                          | 12 "      | .....                     | 1 $\frac{1}{2}$            | .....                      | "                         |
| 23 "     | 4                         | 1                          | .....                      | "                          | 13 "      | 5                         | .....                      | .....                      | "                         |
| 24 "     | 5                         | 1                          | .....                      | "                          | 14 "      | .....                     | 1 $\frac{1}{2}$            | 4                          | "                         |

| Date.           | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors making returns. | Date.        | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors making returns. |
|-----------------|---------------------------|----------------------------|----------------------------|----------------------------|--------------|---------------------------|----------------------------|----------------------------|----------------------------|
| 1895.           |                           |                            |                            |                            | 1896.        |                           |                            |                            |                            |
| 16 Dec. ....    |                           | 4                          | 1 1/4                      | G. Andrew.                 | 3 Feb. ....  |                           |                            | 2 1/4                      | G. Andrew.                 |
| 17 " ....       |                           | 3 1/2                      | 1 1/4                      | "                          | 4 " ....     |                           |                            | 1 1/4                      | "                          |
| 18 " ....       | 6                         | 2 1/2                      | 1                          | "                          | 5 " ....     |                           |                            | 1 1/4                      | "                          |
| 19 " ....       | 3                         | 2                          | 1 1/2                      | "                          | 6 " ....     |                           |                            | 1 1/4                      | "                          |
| 20 " ....       |                           | 2 1/2                      | 1 1/2                      | "                          | 7 " ....     |                           |                            | 1 1/4                      | "                          |
| 21 " ....       | 2                         | 1                          | 1 1/2                      | "                          | 8 " ....     |                           |                            | 1 1/4                      | "                          |
| 23 " ....       | 7                         | 1 1/2                      | 1 1/2                      | "                          | 10 " ....    |                           |                            | 1 1/4                      | "                          |
| 24 " ....       |                           | 1                          | 1 1/4                      | "                          | 11 " ....    |                           |                            | 1 1/4                      | "                          |
| 1896.           |                           |                            |                            |                            | 12 " ....    |                           | 1 1/2                      | 1 1/4                      | "                          |
| 2 January ..... |                           | 1 1/2                      | 1 1/2                      | "                          | 13 " ....    |                           | 1 1/2                      | 1 1/4                      | "                          |
| 3 " ....        |                           | 2 1/2                      | 1 1/4                      | "                          | 14 " ....    |                           |                            | 1 1/4                      | "                          |
| 4 " ....        |                           | 1 1/4                      | 1                          | "                          | 15 " ....    |                           |                            | 1 1/4                      | "                          |
| 6 " ....        |                           | 2 1/2                      | 1                          | "                          | 17 " ....    |                           |                            | 1                          | "                          |
| 7 " ....        |                           | 2                          | 1 1/4                      | "                          | 18 " ....    |                           |                            | 1 3/4                      | "                          |
| 8 " ....        |                           | 2                          | 1                          | "                          | 19 " ....    |                           |                            | 1                          | "                          |
| 9 " ....        | 1                         | 1 1/2                      | 1                          | "                          | 20 " ....    |                           |                            | 1 3/4                      | "                          |
| 10 " ....       | 4 1/2                     | 1                          | 1                          | "                          | 21 " ....    |                           |                            | 1                          | "                          |
| 11 " ....       |                           | 1 1/4                      | 1 1/4                      | "                          | 22 " ....    |                           |                            | 1 3/4                      | "                          |
| 13 " ....       |                           | 1 1/2                      | 1 1/4                      | "                          | 24 " ....    |                           |                            | 1                          | E. C. Board                |
| 14 " ....       |                           | 1                          | 1 1/2                      | "                          | 25 " ....    |                           |                            | 1                          | "                          |
| 16 " ....       |                           | 1 3/4                      | 1 1/2                      | "                          | 26 " ....    |                           |                            | 1 3/4                      | "                          |
| 17 " ....       | 1 1/2                     | 2                          | 1 1/2                      | "                          | 27 " ....    |                           |                            | 1                          | "                          |
| 18 " ....       | 2 1/2                     | 1                          | 1 1/2                      | "                          | 28 " ....    |                           |                            | 1 3/4                      | "                          |
| 20 " ....       |                           | 1 3/4                      | 1 1/2                      | "                          | 29 " ....    |                           |                            | 1 3/4                      | "                          |
| 21 " ....       |                           | 2 3/4                      | 1 1/2                      | "                          | 2 March.. .. |                           |                            | 1                          | "                          |
| 22 " ....       |                           | 2                          | 1 1/2                      | "                          | 3 " ....     |                           |                            | 1 3/4                      | "                          |
| 23 " ....       | 4                         | 1                          | 1                          | "                          | 4 " ....     |                           |                            | 1 3/4                      | "                          |
| 24 " ....       | 1                         | 1 1/2                      | 1 1/2                      | "                          | 5 " ....     |                           |                            | 1 3/4                      | "                          |
| 25 " ....       |                           |                            | 1 1/2                      | "                          | 6 " ....     |                           |                            | 1 3/4                      | "                          |
| 28 " ....       |                           |                            | 1 1/2                      | "                          | 9 & 10 Mar   |                           |                            | 1 1/4                      | G. Andrew.                 |
| 29 " ....       |                           |                            | 2                          | "                          | 11 & 13 "    |                           |                            | 1 1/4                      | "                          |
| 30 " ....       |                           |                            | 2 1/4                      | "                          | 17 & 19 "    |                           |                            | 1 1/4                      | "                          |
| 31 " ....       |                           |                            | 1 1/2                      | "                          |              |                           |                            |                            |                            |
| 1 Feb. ....     |                           |                            | 1                          | "                          |              |                           |                            |                            |                            |
|                 |                           |                            |                            |                            | Total...     | 1,562 3/4                 | 598 1/4                    | 239 1/2                    |                            |

Contract No. 79A.—Summary.

|  |           |
|--|-----------|
| Total amount of casks of cement used in concrete ..... | 1,562 3/4 |
| "    "    "    used in brickwork .....                 | 598 1/4   |
| "    "    "    used in rendering .....                 | 239 1/2   |
| Total .....  | 2,400 1/2 |

CONTRACT NO. 79.—Return of Cement, taken from Inspector's Daily Reports.

| Date.         | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors making returns. | Date.           | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors making returns. |
|---------------|---------------------------|----------------------------|----------------------------|----------------------------|-----------------|---------------------------|----------------------------|----------------------------|----------------------------|
| 1893.         |                           |                            |                            |                            | 1893.           |                           |                            |                            |                            |
| 10 June ...   | 4                         |                            |                            | Parsons.                   | 2 August. 24    |                           |                            |                            | G. A. Fowle.               |
| 12 " ...      | 4                         |                            |                            | "                          | 3 " ... 22      |                           |                            |                            | "                          |
| 13 " ...      | 6                         |                            |                            | "                          | 4 " ... 16      |                           |                            |                            | "                          |
| 15 " ...      | 6                         |                            |                            | G. A. Fowle.               | 5 " ... 9       |                           |                            |                            | "                          |
| 16 " ...      | 13                        |                            |                            | "                          | 7 " ... 23      |                           |                            |                            | "                          |
| 17 " ...      | 9                         |                            |                            | "                          | 8 " ... 16      |                           |                            |                            | "                          |
| 19 " ...      | 16                        |                            |                            | "                          | 9 " ... 22      |                           |                            |                            | "                          |
| 20 " ...      | 24                        |                            |                            | "                          | 10 " ... 14     |                           | 1                          |                            | "                          |
| 21 " ...      | 27                        |                            |                            | "                          | 11 " ... 24     |                           | 2                          |                            | "                          |
| 22 " ...      | 27                        |                            |                            | "                          | 12 " ... 26     |                           | 2                          |                            | "                          |
| 23 " ...      | 27                        |                            |                            | "                          | 14 " ... 28     |                           | 4                          |                            | "                          |
| 24 " ...      | 17                        |                            |                            | "                          | 15 " ... 34     |                           | 4                          | 2                          | "                          |
| 26 " ...      | 29                        |                            |                            | "                          | 16 " ... 41     |                           | 7                          | 2                          | "                          |
| 27 " ...      | 26                        |                            |                            | "                          | 17 " ... 31     |                           | 7                          | 4                          | "                          |
| 28 " ...      | 27                        |                            |                            | "                          | 18 " ... 31     |                           | 5                          | 3                          | "                          |
| 29 " ...      | 21                        |                            |                            | "                          | 19 " ... 38     |                           | 6                          | 3                          | "                          |
| 30 " ...      | 21                        |                            |                            | "                          | 21 " ... 14     |                           | 7                          | 4                          | "                          |
| 1 July ...    | 8                         |                            |                            | "                          | 22 " ... 16 1/2 |                           | 5                          | 5                          | "                          |
| 3 " ...       | 14                        |                            |                            | "                          | 23 " ... 7      |                           | 7                          | 5                          | "                          |
| 11 " ...      | 2                         |                            |                            | "                          | 24 " ... 10     |                           | 9                          | 4                          | "                          |
| 12 " ...      | 1                         |                            |                            | "                          | 25 " ... 12     |                           | 12                         | 4                          | "                          |
| 13 " ...      |                           | 1                          |                            | "                          | 26 " ... 2      |                           | 7                          |                            | "                          |
| 14 " ...      |                           | 2                          |                            | "                          | 28 " ... 6      |                           | 8                          | 1                          | "                          |
| 15 " ...      |                           | 3                          |                            | "                          | 29 " ... 8      |                           | 9                          | 3                          | "                          |
| 17 " ...      |                           | 5                          |                            | "                          | 30 " ... 8      |                           | 7                          | 3                          | "                          |
| 18 " ...      |                           | 4                          |                            | "                          | 31 " ... 5      |                           | 3                          | 2                          | "                          |
| 19 " ...      |                           | 5                          |                            | "                          | 1 Sept. ... 9   |                           | 7                          | 4                          | "                          |
| 20 " ...      |                           | 5                          |                            | "                          | 2 " ... 6       |                           | 6                          | 1                          | "                          |
| 21 " ...      |                           | 6                          |                            | "                          | 4 " ... 8       |                           | 8                          | 1                          | "                          |
| 22 " ...      |                           | 4                          |                            | "                          | 5 " ... 1       |                           | 8                          | 2                          | "                          |
| 24 " ...      |                           | 4                          |                            | "                          | 6 " ... 10      |                           | 13                         | 4                          | "                          |
| 25 " ...      |                           | 4                          |                            | "                          | 7 " ... 10      |                           | 11                         | 3                          | "                          |
| 26 " ...      | 5                         | 6                          |                            | "                          | 8 " ... 12      |                           | 9                          | 3                          | "                          |
| 28 " ...      | 16                        | 4                          |                            | "                          | 9 " ... 9       |                           | 7                          | 2                          | "                          |
| 31 " ...      | 9                         |                            |                            | "                          | 11 " ... 14     |                           | 7                          | 4                          | "                          |
| 1 August. 16. |                           |                            |                            | "                          | 12 " ... 35     |                           | 10                         | 4                          | "                          |

| Date.        | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors making returns. | Date.       | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors making returns. |
|--------------|---------------------------|----------------------------|----------------------------|----------------------------|-------------|---------------------------|----------------------------|----------------------------|----------------------------|
| 1893.        |                           |                            |                            |                            | 1894.       |                           |                            |                            |                            |
| 13 Sept. ... | 40                        | 6                          | 3                          | G. A. Fowle.               | 4 Jan. ...  | 29                        |                            | 7                          | G. A. Fowle.               |
| 14 " ...     | 32                        | 9                          | 4                          | "                          | 5 " ...     | 29                        |                            | 6                          | "                          |
| 15 " ...     | 25                        | 9                          | 3                          | "                          | 6 " ...     | 19                        |                            | 4                          | "                          |
| 16 " ...     | 17                        | 7                          | 4                          | "                          | 8 " ...     | 20                        |                            | 4                          | "                          |
| 18 " ...     | 34                        | 8                          | 1                          | "                          | 9 " ...     | 10                        |                            | 5                          | "                          |
| 19 " ...     | 35                        | 9                          | 2                          | "                          | 10 " ...    | 13                        |                            | 5                          | "                          |
| 20 " ...     | 33                        | 4                          | 2                          | "                          | 11 " ...    | 17                        |                            | 5                          | "                          |
| 21 " ...     | 34                        | 4                          | .....                      | "                          | 12 " ...    | 18                        |                            | 5                          | "                          |
| 22 " ...     | 44                        | 8                          | 2                          | "                          | 13 " ...    | 16                        |                            | 4                          | "                          |
| 23 " ...     | 30                        | 5                          | .....                      | "                          | 15 " ...    | 12                        |                            | 5                          | "                          |
| 25 " ...     | 33                        | 5                          | 3                          | "                          | 16 " ...    | 19                        |                            | 3                          | "                          |
| 26 " ...     | 31                        | 8                          | 7                          | "                          | 17 " ...    | 6                         | .....                      | .....                      | "                          |
| 27 " ...     | 40                        | 5                          | 5                          | "                          | 18 " ...    | 15                        |                            | 4                          | "                          |
| 28 " ...     | 38                        | 3                          | 7                          | "                          | 19 " ...    | 8                         |                            | 2                          | "                          |
| 29 " ...     | 19                        | 3                          | 6                          | "                          | 20 " ...    | 17                        |                            | 1                          | "                          |
| 3 Oct. ....  | .....                     | 2                          | 2                          | "                          | 22 " ...    | 8                         |                            | 3                          | "                          |
| 5 " ...      | 13                        | 8                          | 5                          | "                          | 23 " ...    | 3                         |                            | 4                          | "                          |
| 4 " ...      | 11                        | 7                          | 4                          | "                          | 24 " ...    | 13                        |                            | 3                          | "                          |
| 6 " ...      | 23                        | 10                         | 5                          | "                          | 25 " ...    | .....                     |                            | 3                          | "                          |
| 7 " ...      | 9                         | 9                          | 3                          | "                          | 26 " ...    | 11                        | .....                      | .....                      | "                          |
| 9 " ...      | .....                     | 4                          | 4                          | "                          | 27 " ...    | 16                        | .....                      | 4                          | "                          |
| 10 " ...     | 2                         | .....                      | 4                          | "                          | 29 " ...    | 6                         | .....                      | 2                          | "                          |
| 11 " ...     | .....                     | .....                      | 6                          | "                          | 30 " ...    | 20                        | .....                      | 3                          | "                          |
| 12 " ...     | 4                         | .....                      | 4                          | "                          | 31 " ...    | 16                        | .....                      | 3                          | "                          |
| 13 " ...     | 11                        | 2                          | 3                          | "                          | 1 Feb. ...  | 8                         |                            | 2                          | "                          |
| 14 " ...     | 6                         | 5                          | 1                          | "                          | 2 " ...     | 3½                        |                            | 1                          | "                          |
| 16 " ...     | 11                        | 11                         | 2                          | "                          | 3 " ...     | 8                         |                            | ½                          | "                          |
| 17 " ...     | 8                         | 12                         | 7                          | "                          | 5 " ...     | .....                     |                            | ½                          | "                          |
| 18 " ...     | 12                        | 12                         | 7                          | "                          | 6 " ...     | 10                        |                            | ½                          | "                          |
| 19 " ...     | 3                         | 12                         | 7                          | "                          | 7 " ...     | 4                         |                            | 1                          | "                          |
| 20 " ...     | 5                         | 12                         | 4                          | "                          | 9 " ...     | .....                     |                            | 1                          | "                          |
| 21 " ...     | 7                         | 8                          | 3                          | "                          | 10 " ...    | .....                     |                            | ½                          | "                          |
| 23 " ...     | 24                        | 9                          | 6                          | "                          | 12 " ...    | .....                     |                            | ½                          | "                          |
| 24 " ...     | 26                        | 14                         | 7                          | "                          | 13 " ...    | 5                         |                            | ½                          | "                          |
| 25 " ...     | 30                        | 15                         | 3                          | "                          | 14 " ...    | 6                         |                            | 1                          | "                          |
| 26 " ...     | 41                        | 20                         | 4                          | "                          | 15 " ...    | 6                         |                            | 1                          | "                          |
| 27 " ...     | 29                        | 19                         | 3                          | "                          | 16 " ...    | 22                        |                            | 2                          | "                          |
| 28 " ...     | 15                        | 17                         | 2                          | "                          | 17 " ...    | 20                        |                            | 2                          | "                          |
| 30 " ...     | 37                        | 20                         | 4                          | "                          | 19 " ...    | 14                        |                            | 1                          | "                          |
| 31 " ...     | 17                        | 19                         | 4                          | "                          | 20 " ...    | 18                        |                            | 2                          | "                          |
| 1 Nov. ....  | 26                        | 18                         | 4                          | "                          | 21 " ...    | 16                        |                            | 2                          | "                          |
| 2 " ...      | 30                        | 28                         | 2                          | "                          | 22 " ...    | 13                        |                            | 2                          | "                          |
| 3 " ...      | 34                        | 23                         | 4                          | "                          | 23 " ...    | 9                         |                            | 4                          | "                          |
| 4 " ...      | .....                     | 17                         | 2                          | "                          | 24 " ...    | 9                         |                            | 3                          | "                          |
| 6 " ...      | 42                        | 21                         | 3                          | "                          | 26 " ...    | 7                         |                            | 3                          | "                          |
| 7 " ...      | 26                        | 29                         | 4                          | "                          | 27 " ...    | 10                        |                            | 3                          | "                          |
| 8 " ...      | 25                        | 22                         | 1                          | "                          | 28 " ...    | 4                         |                            | 2                          | "                          |
| 10 " ...     | .....                     | 28                         | .....                      | "                          | 1 Mar. ...  | 2                         |                            | 2                          | "                          |
| 11 " ...     | .....                     | 19                         | 1                          | "                          | 2 " ...     | 5                         |                            | 2                          | "                          |
| 13 " ...     | 26                        | 20                         | 3                          | "                          | 3 " ...     | 5                         |                            | 9                          | "                          |
| 13 " ...     | .....                     | 15                         | 3                          | "                          | 5 " ...     | .....                     |                            | 2                          | "                          |
| 15 " ...     | 29                        | 11                         | 6                          | "                          | 6 " ...     | .....                     |                            | 1                          | "                          |
| 16 " ...     | 29                        | 12                         | 5                          | "                          | 7 " ...     | 5                         |                            | 2                          | "                          |
| 17 " ...     | 35                        | 17                         | 6                          | "                          | 8 " ...     | 3                         |                            | 1½                         | "                          |
| 18 " ...     | 16                        | 8                          | 6                          | "                          | 9 " ...     | .....                     |                            | 2                          | "                          |
| 20 " ...     | 25                        | 9                          | 6                          | "                          | 10 " ...    | .....                     |                            | ½                          | "                          |
| 21 " ...     | .....                     | 21                         | 8                          | "                          | 14 " ...    | 6                         |                            | .....                      | "                          |
| 22 " ...     | 6                         | 20                         | 6                          | "                          | 15 " ...    | ½                         |                            | 9                          | N. Longheed                |
| 23 " ...     | 23                        | 15                         | 7                          | "                          | 16 " ...    | .....                     |                            | 1                          | "                          |
| 24 " ...     | 17                        | 22                         | 7                          | "                          | 17 " ...    | .....                     |                            | ½                          | "                          |
| 25 " ...     | 13                        | 18                         | 4                          | "                          | 19 " ...    | .....                     |                            | ½                          | "                          |
| 27 " ...     | 9                         | 20                         | 6                          | "                          | 20 " ...    | .....                     |                            | ½                          | "                          |
| 28 " ...     | .....                     | 20                         | 6                          | "                          | 21 " ...    | .....                     |                            | ½                          | "                          |
| 29 " ...     | .....                     | 17                         | 5                          | "                          | 22 " ...    | .....                     |                            | ½                          | "                          |
| 1 Dec. ....  | 3                         | 15                         | 7                          | "                          | 27 " ...    | .....                     |                            | ½                          | "                          |
| 2 " ...      | 12                        | 22                         | 4                          | "                          | 29 " ...    | .....                     |                            | ½                          | "                          |
| 4 " ...      | .....                     | 22                         | 5                          | "                          | 30 " ...    | .....                     |                            | ½                          | "                          |
| 5 " ...      | 8                         | 23                         | 5                          | "                          | 31 " ...    | .....                     |                            | ½                          | "                          |
| 6 " ...      | 7                         | 16                         | 4                          | "                          | 2 April ... | .....                     |                            | ½                          | "                          |
| 7 " ...      | .....                     | 20                         | 5                          | "                          | 3 " ...     | .....                     |                            | ½                          | "                          |
| 8 " ...      | .....                     | 24                         | 3                          | "                          | 4 " ...     | .....                     |                            | ½                          | "                          |
| 9 " ...      | .....                     | 18                         | 3                          | "                          | 5 " ...     | 1½                        |                            | .....                      | "                          |
| 11 " ...     | 3                         | 7                          | 5                          | "                          | 6 " ...     | .....                     |                            | ½                          | "                          |
| 12 " ...     | 10                        | 21                         | 6                          | "                          | 7 " ...     | 1½                        |                            | .....                      | "                          |
| 13 " ...     | 2                         | 22                         | 6                          | "                          | 9 " ...     | 3½                        |                            | .....                      | "                          |
| 14 " ...     | .....                     | 22                         | 6                          | "                          | 10 " ...    | 7½                        |                            | ½                          | "                          |
| 15 " ...     | .....                     | 14                         | 5                          | "                          | 11 " ...    | .....                     |                            | 3                          | "                          |
| 16 " ...     | .....                     | 16                         | 4                          | "                          | 12 " ...    | 7                         |                            | ½                          | "                          |
| 18 " ...     | .....                     | 15                         | .....                      | "                          | 13 " ...    | 13                        |                            | .....                      | "                          |
| 19 " ...     | .....                     | 22                         | 6                          | "                          | 14 " ...    | 4                         |                            | 1½                         | "                          |
| 20 " ...     | .....                     | 22                         | 4                          | "                          | 16 " ...    | 10                        |                            | 1½                         | "                          |
| 21 " ...     | .....                     | 21                         | 3                          | "                          | 17 " ...    | 6                         |                            | 1                          | "                          |
| 22 " ...     | 3                         | 25                         | 4                          | "                          | 18 " ...    | 2                         |                            | 1                          | "                          |
| 23 " ...     | 5                         | 20                         | 2                          | "                          | 20 " ...    | 2                         |                            | 1                          | "                          |
| 27 " ...     | .....                     | 8                          | .....                      | "                          | 21 " ...    | 1                         |                            | ½                          | "                          |
| 28 " ...     | .....                     | 10                         | 3                          | "                          | 23 " ...    | 1                         |                            | 1                          | "                          |
| 29 " ...     | .....                     | 15                         | 4                          | "                          | 24 " ...    | 1                         |                            | .....                      | "                          |
| 30 " ...     | .....                     | 14                         | 4                          | "                          | 26 " ...    | .....                     |                            | 131½                       | "                          |
| 1894.        |                           |                            |                            |                            | 27 " ...    | 10                        |                            | .....                      | "                          |
| 3 Jan. ....  | .....                     | 14                         | 6                          | "                          | 28 " ...    | 1½                        |                            | .....                      | "                          |



| Date.      | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors making returns. | Date.       | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors making returns. |
|------------|---------------------------|----------------------------|----------------------------|----------------------------|-------------|---------------------------|----------------------------|----------------------------|----------------------------|
| 1894.      |                           |                            |                            |                            | 1894.       |                           |                            |                            |                            |
| 1 May ...  | 6                         | 1                          | .....                      | N. Longheed                | 14 June ... | .....                     | .....                      | 1                          | N. Longheed                |
| 2 " ...    | 5                         | 2                          | .....                      | "                          | 15 " ...    | .....                     | .....                      | 1                          | "                          |
| 3 " ...    | 7                         | 3                          | .....                      | "                          | 16 " ...    | .....                     | .....                      | 1                          | "                          |
| 4 " ...    | 8                         | 4                          | .....                      | "                          | 17 " ...    | .....                     | .....                      | 1                          | "                          |
| 5 " ...    | 8                         | 2                          | .....                      | "                          | 19 " ...    | .....                     | .....                      | 1 1/2                      | "                          |
| 7 " ...    | 9                         | 1 1/2                      | .....                      | "                          | 20 " ...    | .....                     | .....                      | 1 1/2                      | "                          |
| 8 " ...    | .....                     | 3                          | .....                      | "                          | 22 " ...    | .....                     | .....                      | 1                          | "                          |
| 9 " ...    | 10                        | 6                          | .....                      | "                          | 25 " ...    | .....                     | .....                      | 1 1/2                      | "                          |
| 10 " ...   | 11                        | .....                      | 2 1/2                      | "                          | 26 " ...    | .....                     | .....                      | 1 1/2                      | "                          |
| 11 " ...   | 8                         | .....                      | 1 1/2                      | "                          | 27 " ...    | .....                     | .....                      | 1 1/2                      | "                          |
| 12 " ...   | 3                         | .....                      | .....                      | "                          | 28 " ...    | .....                     | .....                      | 1 1/2                      | "                          |
| 14 " ...   | 3                         | 1 1/2                      | 1 1/2                      | "                          | 4 July ...  | .....                     | .....                      | 1 1/2                      | "                          |
| 15 " ...   | .....                     | 4                          | 1 1/2                      | "                          | 5 " ...     | .....                     | .....                      | 1 1/2                      | "                          |
| 16 " ...   | .....                     | 3 1/2                      | .....                      | "                          | 7 " ...     | .....                     | .....                      | 1 1/2                      | "                          |
| 17 " ...   | .....                     | 2 1/2                      | 1 1/2                      | "                          | 12 " ...    | .....                     | .....                      | 1 1/2                      | "                          |
| 18 " ...   | .....                     | 3                          | 1 1/2                      | "                          | 14 " ...    | .....                     | .....                      | 1 1/2                      | "                          |
| 19 " ...   | .....                     | 1                          | 1                          | "                          | 24 " ...    | 2                         | .....                      | .....                      | "                          |
| 21 " ...   | .....                     | 2 1/2                      | 1                          | "                          | 25 " ...    | 11                        | .....                      | .....                      | "                          |
| 22 " ...   | .....                     | 3                          | 1 1/2                      | "                          | 26 " ...    | 2                         | .....                      | .....                      | "                          |
| 23 " ...   | .....                     | 2                          | 1 1/2                      | "                          | 27 " ...    | 3                         | .....                      | .....                      | "                          |
| 25 " ...   | .....                     | 3                          | 1 1/2                      | "                          | 28 " ...    | 3                         | .....                      | .....                      | "                          |
| 26 " ...   | .....                     | 3                          | .....                      | "                          | 30 " ...    | 8                         | .....                      | .....                      | "                          |
| 28 " ...   | .....                     | 3                          | 1                          | "                          | 30 " ...    | 8                         | .....                      | .....                      | "                          |
| 30 " ...   | .....                     | .....                      | 1                          | "                          | 31 " ...    | .....                     | .....                      | 1                          | "                          |
| 31 " ...   | .....                     | .....                      | 1                          | "                          | 1 April ..  | .....                     | .....                      | 1                          | "                          |
| 1 June ... | .....                     | .....                      | 1                          | "                          | 4 " ...     | .....                     | .....                      | 1 1/2                      | "                          |
| 2 " ...    | .....                     | .....                      | 1 1/2                      | "                          | 6 " ...     | .....                     | .....                      | 1 1/2                      | "                          |
| 4 " ...    | .....                     | .....                      | 1                          | "                          | 7 " ...     | .....                     | .....                      | 1 1/2                      | "                          |
| 7 " ...    | .....                     | .....                      | 1 1/2                      | "                          | 10 " ...    | .....                     | .....                      | 1                          | "                          |
| 9 " ...    | .....                     | .....                      | 1 1/2                      | "                          |             |                           |                            |                            |                            |
| 12 " ...   | .....                     | .....                      | 1 1/2                      | "                          |             |                           |                            |                            |                            |
| 13 " ...   | .....                     | .....                      | 1                          | "                          |             |                           |                            |                            |                            |
|            |                           |                            |                            |                            |             | 2,569                     | 2,158 1/2                  | 421                        |                            |

Summary Contract No. 79.

|   |           |
|---|-----------|
| Total number of casks of cement used in concrete .....  | 2,569     |
| Total number of casks of cement used in brickwork ..... | 2,158 1/2 |
| Total number of casks of cement used in rendering ..... | 421       |
| Total .....   | 5,148 1/2 |

CONTRACT No. 77.—Return of Cement, taken from Inspector's Daily Returns.

| Date.       | No. of casks in concrete and compo. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors making returns. | Date.       | No. of casks in concrete and compo. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors making returns. |
|-------------|-------------------------------------|----------------------------|----------------------------|----------------------------|-------------|-------------------------------------|----------------------------|----------------------------|----------------------------|
| 1895.       |                                     |                            |                            |                            | 1895.       |                                     |                            |                            |                            |
| Week ending |                                     |                            |                            |                            | Week ending |                                     |                            |                            |                            |
| 7 Sept. ... | 4                                   | .....                      | .....                      | C. Clymer.                 | 22 Feb. ... | 79 1/2                              | .....                      | .....                      | C. Clymer.                 |
| 14 " ...    | 67 1/2                              | .....                      | .....                      | "                          | 29 " ...    | 53                                  | .....                      | .....                      | "                          |
| 21 " ...    | 87 3/4                              | .....                      | .....                      | "                          | 7 Mar. ...  | 54                                  | .....                      | .....                      | "                          |
| 28 " ...    | 104 3/4                             | .....                      | .....                      | "                          | 21 " ...    | 134                                 | .....                      | .....                      | "                          |
| 5 Oct. ...  | 95 3/4                              | .....                      | .....                      | "                          | 28 " ...    | 136 1/2                             | .....                      | .....                      | "                          |
| 12 " ...    | 73                                  | .....                      | .....                      | "                          | 4 April ... | 81 1/2                              | .....                      | .....                      | "                          |
| 19 " ...    | 4                                   | .....                      | .....                      | "                          | 11 " ...    | 52                                  | .....                      | .....                      | "                          |
| 26 " ...    | 74 1/2                              | .....                      | .....                      | "                          | 25 " ...    | 128                                 | .....                      | .....                      | "                          |
| 2 Nov. ...  | 20 1/2                              | .....                      | .....                      | "                          | 1 May ...   | 63                                  | .....                      | 18                         | "                          |
| 9 " ...     | 111 1/2                             | .....                      | .....                      | "                          | 8 " ...     | 100 1/2                             | .....                      | 20                         | "                          |
| 16 " ...    | 78 3/4                              | .....                      | .....                      | "                          | 15 " ...    | 97 1/2                              | .....                      | 5                          | "                          |
| 23 " ...    | 202 3/4                             | .....                      | .....                      | "                          | 22 " ...    | 81                                  | .....                      | 11 1/2                     | "                          |
| 29 " ...    | 78 1/2                              | .....                      | .....                      | "                          | 29 " ...    | 37                                  | .....                      | .....                      | "                          |
| 7 Dec. ...  | 103                                 | .....                      | .....                      | "                          | 5 June ...  | 43                                  | .....                      | 1 1/2                      | "                          |
| 13 " ...    | 14 1/2                              | .....                      | .....                      | "                          | 12 " ...    | 46                                  | .....                      | 6 1/2                      | "                          |
| 21 " ...    | 49 1/2                              | .....                      | .....                      | "                          | 19 " ...    | 35                                  | .....                      | 12                         | "                          |
| 1896.       |                                     |                            |                            |                            | 26 " ...    | 12 1/2                              | .....                      | 3                          | "                          |
| 4 Jan. ...  | 31                                  | .....                      | .....                      | "                          | 3 July ...  | .....                               | .....                      | 2                          | "                          |
| 11 " ...    | 74                                  | .....                      | .....                      | "                          | 10 " ...    | .....                               | .....                      | .....                      | "                          |
| 18 " ...    | 118                                 | .....                      | .....                      | "                          |             |                                     |                            |                            |                            |
| 25 " ...    | 101                                 | .....                      | .....                      | "                          |             |                                     |                            |                            |                            |
| 1 Feb. ...  | 89                                  | .....                      | .....                      | "                          |             | 2,987                               | .....                      | 78 1/2                     |                            |
| 8 " ...     | 120 1/2                             | .....                      | .....                      | "                          |             |                                     |                            |                            |                            |
| 15 " ...    | 50                                  | .....                      | .....                      | "                          | 10 " ...    | 46                                  | .....                      | .....                      |                            |
|             |                                     |                            |                            |                            |             | 3,033                               |                            |                            |                            |

CONTRACT No. 69.

|    | March, 1894. | April, 1894. | May, 1894. | June, 1894. | July, 1894. | August, 1894. | September, 1894. | October, 1894. | November, 1894. | December, 1894. | January, 1895. | February, 1895. | March, 1895. | April, 1895. | May, 1895. | June, 1895. | July, 1895. | August, 1895. | September, 1895. | October, 1895. |
|----|--------------|--------------|------------|-------------|-------------|---------------|------------------|----------------|-----------------|-----------------|----------------|-----------------|--------------|--------------|------------|-------------|-------------|---------------|------------------|----------------|
| 1  | ...          | ...          | 28         | 16½         | ...         | 33½           | 32½              | ...            | 18½             | 9½              | ...            | 25½             | 16½          | 14½          | 9½         | 10          | 11½         | 19            | ...              | 1½             |
| 2  | 25           | ...          | 21         | 28½         | ...         | 33            | ...              | 36½            | 17              | ...             | 13½            | 15½             | 17½          | 22½          | 10½        | ...         | 11½         | 10½           | 4                | 1½             |
| 3  | ...          | 23           | 25         | ...         | 3½          | 53            | 3                | 40½            | 25½             | 16½             | 19½            | ...             | ...          | 16½          | 9½         | 11½         | 10½         | 15½           | 3½               | 1½             |
| 4  | ...          | 4            | 25         | 43½         | 22½         | 27            | 7                | 39½            | ...             | 16              | 16½            | 27½             | 22           | 7            | 4½         | 12½         | 10½         | ...           | 2½               | 1½             |
| 5  | 14           | 18           | 15         | 47          | 18½         | ...           | 31½              | 38½            | 22½             | 16½             | 12½            | 14½             | 26½          | ...          | ...        | 12½         | 18          | 17½           | 2½               | 1½             |
| 6  | 28           | 21           | ...        | 47          | 29½         | 9½            | 28               | 19½            | 21              | 20½             | ...            | 13½             | 17           | 6            | 5½         | 12          | 15½         | 15½           | 3½               | ...            |
| 7  | 16           | 11           | 25½        | 40½         | 18½         | 18            | 26½              | ...            | 19              | 19½             | 18½            | 3½              | 17           | ...          | 5½         | 9½          | ...         | 3½            | 2                | 1½             |
| 8  | 26           | ...          | 27½        | 36          | ...         | 53½           | 13½              | 21½            | 12½             | 16½             | 25½            | ...             | 20½          | 14½          | 9½         | 12½         | 20½         | 3½            | ...              | 2              |
| 9  | 16           | 16           | 17½        | 23          | 26          | 42            | ...              | 5½             | ...             | ...             | 23½            | 12              | 5            | 13½          | 11½        | ...         | 18½         | 4½            | 4½               | 1½             |
| 10 | 11           | 20           | 29½        | ...         | 29½         | 56½           | 26½              | 16             | 9½              | 14½             | 21½            | ...             | ...          | 11½          | 10         | 10½         | 16½         | 3½            | 4½               | 1½             |
| 11 | ...          | 22           | 26½        | 14          | 23½         | 16½           | 28               | 33½            | ...             | 15½             | 17½            | 27½             | 12½          | ...          | 6½         | 10          | 16½         | ...           | 5                | 4              |
| 12 | ...          | 26           | 13½        | 16½         | 32          | ...           | 27½              | 28½            | 29½             | 13½             | 14½            | 21              | ...          | ...          | ...        | 19½         | 11½         | 17½           | 4½               | ½              |
| 13 | 1            | 26           | ...        | 14½         | 34½         | 17½           | 30               | 15½            | 26½             | 10½             | ...            | 23              | 4            | ...          | 8½         | 16½         | 9½          | 3½            | ...              | ...            |
| 14 | 1½           | 16           | 27½        | 4½          | 20          | 27            | 44               | ...            | 23½             | 11½             | 22             | 12              | 6            | ...          | 18½        | 5           | 8½          | 2             | ½                | ...            |
| 15 | 11           | ...          | 29½        | ...         | 24½         | 51            | 26               | 13½            | 19½             | 5½              | 22             | 17½             | 24½          | ...          | 17½        | 4½          | 5½          | 7½            | ½                | ...            |
| 16 | 4            | 26           | 51         | ...         | 37          | 30            | ...              | 41½            | 14½             | ...             | 19½            | 6½              | 11           | 10½          | ...        | 8½          | 8½          | 3             | 3                | ...            |
| 17 | 2            | 7            | 51½        | ...         | ...         | 28½           | 51               | 26             | 13½             | 10½             | 21             | ...             | ...          | 9½           | 15         | 9½          | ...         | 2½            | ½                | ...            |
| 18 | ...          | 6            | 53         | ...         | 44          | 11            | 61½              | ...            | 13              | ...             | 26             | 17½             | 14½          | 8½           | 8½         | 15          | 9½          | ...           | 2½               | ...            |
| 19 | ...          | 13           | 14         | 2           | 36          | ...           | 62½              | 26½            | 11½             | 16½             | 15½            | 27              | 14½          | 9½           | ...        | 4           | 20          | 2½            | 2½               | ...            |
| 20 | ...          | 28½          | ...        | 7½          | 17          | 27            | 52½              | 9              | 17½             | 17              | 19½            | 19½             | 11½          | 7½           | 10         | 12          | 15½         | 3             | 2                | ...            |
| 21 | ...          | 10           | 36½        | ½           | 30          | 27½           | 48               | ...            | 22              | 17½             | 22½            | 18½             | 9            | 9½           | 11         | ...         | 9½          | 3             | 2                | ½              |
| 22 | ...          | ...          | 35½        | 4           | ...         | 18½           | 13½              | 27½            | 17½             | 11½             | 4              | 23½             | 9            | 13½          | 4½         | 18          | 9½          | 2½            | ...              | ...            |
| 23 | ...          | 17           | 38         | 8           | 31½         | 23            | ...              | 28½            | 25½             | ...             | 4½             | 14              | 3½           | 11½          | ...        | 12          | 2½          | ...           | 2½               | ...            |
| 24 | 2½           | 21           | ...        | ...         | 29          | 30            | 35               | 35½            | 10½             | ...             | 10             | ...             | ...          | 14½          | 9          | ...         | 1           | 2½            | ...              | ...            |
| 25 | ...          | 3            | 38         | 12          | 32          | 19½           | 17½              | 19             | ...             | ...             | 9              | 22              | 5½           | 21½          | ...        | 10½         | ...         | 2             | ...              | ...            |
| 26 | ...          | 3            | 20         | 1           | 34½         | ...           | 13½              | 25½            | 24              | ...             | ...            | 18              | 15½          | 13           | ...        | 12          | 10          | 1½            | 2½               | ...            |
| 27 | 5            | 3½           | ...        | ½           | 35          | 33            | 34               | 13             | 16½             | ...             | ...            | 19              | 11½          | 7            | 7          | 10          | 5½          | 3½            | 2½               | ...            |
| 28 | 1            | 1½           | 40½        | ...         | 17          | 46½           | 34½              | ...            | 17½             | ...             | 25             | 34              | 9½           | ...          | 13½        | 11          | ...         | 3½            | 1½               | ...            |
| 29 | 4            | ...          | 40½        | ...         | 27½         | 42½           | ...              | 17             | 18              | ...             | 14             | ...             | 14½          | 5            | 13½        | 10½         | 10          | 3½            | ...              | ...            |
| 30 | 6½           | 11           | 15½        | ...         | 30½         | 15            | ...              | 27½            | 15½             | ...             | 24½            | ...             | 8½           | 12½          | 14         | ...         | 20½         | ...           | 3                | ...            |
| 31 | ...          | ...          | 34½        | ...         | 31          | 24            | ...              | 24½            | ...             | ...             | 25             | ...             | ...          | ...          | 12½        | ...         | 18          | 3             | ...              | ...            |
|    |              |              |            |             |             |               |                  |                |                 |                 |                |                 |              |              |            |             |             |               |                  | 7,963          |

CONTRACT No. 118.

|    | August, 1895. | September, 1895. | October, 1895. | November, 1895. | December, 1895. | January, 1896. | February, 1896. | March, 1896. | April, 1896. | May, 1896. |
|----|---------------|------------------|----------------|-----------------|-----------------|----------------|-----------------|--------------|--------------|------------|
| 1  | .....         | .....            | 75             | 48              | .....           | .....          | 3               | .....        | 6            | ½          |
| 2  | .....         | 51½              | 32             | 45              | 6               | 7              | .....           | 6            | 13           | .....      |
| 3  | .....         | 47               | 55             | .....           | 8               | 8              | 17              | 26           | .....        | .....      |
| 4  | .....         | 14               | 68             | .....           | 8               | 6              | 44              | 42           | 6            | .....      |
| 5  | .....         | 49               | 48             | 17              | 16              | .....          | 33              | 27           | .....        | .....      |
| 6  | .....         | 63               | .....          | 17              | 14              | 7              | 22              | 5            | .....        | .....      |
| 7  | .....         | 30½              | .....          | 10              | 4               | 7              | 2               | 20           | 3            | 3          |
| 8  | .....         | .....            | 57½            | 33              | 8               | 5              | 3               | .....        | 2            | 10         |
| 9  | 6             | 42               | 73             | 4               | .....           | 5              | .....           | 34           | 1            | 2          |
| 10 | 6             | 5                | 77             | .....           | 7               | .....          | .....           | 29           | 3            | .....      |
| 11 | .....         | 17½              | 77             | 85              | .....           | .....          | 12              | 17           | 2            | .....      |
| 12 | 2             | 59               | 44             | 88              | .....           | .....          | 52              | 25           | .....        | 3          |
| 13 | .....         | 67               | .....          | 85              | 2               | 10             | 53              | 27           | 3            | .....      |
| 14 | .....         | 21               | 74             | 95              | .....           | .....          | 19              | 1            | 8            | 1½         |
| 15 | 28            | .....            | 76             | 81              | .....           | .....          | 1               | .....        | 7            | .....      |
| 16 | 78            | 54               | 79             | 54              | 5               | 2              | .....           | 11           | 3            | 1          |
| 17 | 50            | .....            | 73             | .....           | 7               | 1              | .....           | 10           | 3            | .....      |
| 18 | .....         | 5½               | 74             | 76              | 8               | .....          | .....           | 10           | 1            | 1          |
| 19 | 82            | 77               | 51             | 94              | 6               | .....          | 1               | 2            | .....        | 1          |
| 20 | 84            | 77               | .....          | 83              | 7               | .....          | 4               | .....        | 4            | .....      |
| 21 | 90            | 43               | 55             | 97              | 3               | 1              | 20              | .....        | 1            | .....      |
| 22 | 84            | .....            | 10             | 85              | .....           | 7              | 24              | .....        | 6            | .....      |
| 23 | 81            | 16               | 31             | 21              | 1               | 5              | .....           | 10           | 6            | .....      |
| 24 | 51            | 71               | 61             | .....           | 2               | 7              | 45              | 8            | 1            | .....      |
| 25 | .....         | 88               | 54             | 6               | .....           | 2              | 23              | 11           | 4            | .....      |
| 26 | .....         | .....            | 38             | 16              | .....           | .....          | .....           | 11           | .....        | 2          |
| 27 | 37½           | .....            | .....          | 16              | .....           | .....          | 46              | 5            | 2            | 2          |
| 28 | 46            | .....            | 59             | 9               | .....           | 4              | 45              | 9            | .....        | .....      |
| 29 | 58            | .....            | 61             | 6               | .....           | 14             | 2               | .....        | 3            | .....      |
| 30 | 48            | 50               | 5              | 4               | .....           | 12             | .....           | 20           | .....        | 1          |
| 31 | 39            | .....            | 14             | .....           | 6               | 12             | .....           | 24           | .....        | .....      |
|    | 870½          | 948              | 1,421½         | 1,175           | 118             | 122            | 471             | 390          | 88           | 28         |

|                 |                |
|-----------------|----------------|
| 1895.           | 1896.          |
| August .....    | January .....  |
| September ..... | February ..... |
| October .....   | March .....    |
| November .....  | April .....    |
| December .....  | May .....      |

Total number of casks of cement used ..... 5,632

## Appendix No. 56.

Inspector Fowle to Engineer Weedon.

Contract 79, North Sydney,  
19 February, 1894.

Sir,

I beg to report that on several occasions I have had to complain about the time the sandstone concrete is mixed for packing brickwork in shafts. To-day two 20-foot mixings were made up at 2 p.m. at No. 5 shaft. This concrete will not be put down shaft for use till 5.30 p.m. I have instructed Connors (foreman), who has charge of this work, not to have the concrete mixed so long before being used. He states to me that he has to take his instructions from the firm. I saw Mr. Snodgrass last Friday and complained to him about this matter, when he promised it should not be mixed until one hour before it is required to be used. I spoke to Reid (contractors' representative) to-day, and he states that they shall mix the concrete when convenient for themselves.

Inspector Reid informs me that on Saturday last, 17th February, about 1 p.m. at No. 6 shaft, it required half mixing 10 feet of sandstone concrete to finish brickwork packing in shaft. Henderson, bricklayer working in shaft, was on mixing board, and started to assist labourer gauge the stone. Inspector Reid instructed Henderson to use the fork in place of shovel in filling the gauge-box, as the stone which is broken close to the mixing-board, is not free from refuse. Inspector Reid asked Henderson the second time to use the fork. Henderson replied that it did not want forking. Connor's foreman came on the scene and said to Henderson, "Go on; do not take any notice of him, he's only a damned big buck navvy."

I have, &amp;c.,

G. A. FOWLE,

Inspector.

Correct.—R. G. REID.

When I first observed mixed concrete on the board at mouth of shaft No. 5, and found from Inspector Reid that it would not be used before evening, I pointed out to him that this was too long for it to stand, for though mixed dry, the stone had been soaked with water and the sand wetted by the rain. He told me the matter had been inquired into and settled by yourself and the contractors. I am still of opinion that it is detrimental to the strength of the concrete for cement to be mixed for hours with the other wetted materials before going into the work. I beg to point out that such friction, as is evident by this report, between our inspector and the contractors' men should be put a stop to at once by removing the offending party from the works, as no satisfactory work can be done under the strained conditions obtaining at present.—S.H.W., 20/2/94. Mr. Davis.

Ask Carter &amp; Co. to see me.—R.H., 31/2/94.

The Engineer-in-Chief decided that Connor was to be removed from the North Shore contract, and that Reid was to leave when the work in Contract No. 79 was finished. Inspector Reid is also to go from Contract No. 79. I have already instructed Mr. Weedon to let Inspector Reid change places with Inspector Eyre.—J.D., 22/2/94. Mr. Weedon.

Accordingly.—S.H.W., 23/2/94. File.—J.D., 26/2/94.

## Appendix No. 57.

Improved method of Construction for use in connection with Works in which Cement and its mixtures are employed.

Contents:—(1.) Introductory description. (2.) System as applied to Bridges. (3.) System as applied to Culverts, Tunnels, and Pipes. (4.) System as applied to Iron Bridges.

## INTRODUCTORY DESCRIPTION.

## IMPROVED METHOD OF CONSTRUCTION FOR USE IN CONNECTION WITH WORKS IN WHICH CEMENT AND ITS MIXTURES ARE EMPLOYED.

THE principle of this method of construction is to increase the extremely small tensile strength of cement and its mixtures, which is to its compressive strength in the ratio of 1 to 10, by embedding wrought-iron bars in the mortar in such places where the construction is subject to tension. The compressive strength of a mixture of 1 cement and 3 sand is from 2,000 lb. to 2,450 lb., the tensile only 200 lb. to 245 lb. per square inch.

The iron bars used are round, from  $\frac{3}{8}$ -inch to 1-inch diameter, as found necessary, and are so placed that the stronger are in the direction of the tension, the thinner resting on the former, usually at right angles to them, thus forming a lattice work. The bars are only held together at their intersection by thin binding wire just sufficient to hold them in position during the process of packing the cement mortar round them, which will keep them in place when once set.

If not sufficiently long the bars are jointed by a very simple method. They are so placed as to overlap each other by twenty times the diameter of the bars, and then tied together. The cohesion between iron and cement, which is, according to Professor Bauschinger, of Munich, 500 lb. to 600 lb. per square inch, and which is not diminished by heat, is quite sufficient to form a bond.

The lattice work is calculated to withstand all the tension the structure is likely to be subjected to. To achieve this it is only necessary to take the bars in the direction of the tension into consideration, as the others are only to distribute the pressure equally over the former. When the iron structure is finished the cement mortar, usually of 1 cement to 3 sand, is pressed through the meshes in convenient thicknesses of not over 9 inches on to the centering, which is generally  $\frac{3}{4}$  inch clear of the iron, and well rammed. In setting, the cement mortar shrinks and gets a firm grip round the iron, and as the cohesion between the two materials is very great, the whole forms one homogeneous mass. The physical properties of this combination are very favourable. The coefficient of expansion of cement mortar is from 0.000137 to 0.000148, that of iron 0.000145, or nearly the same; and even if a small difference should exist, the elasticity of the mortar is sufficient to equalise the difference. Further, in this combination the iron loses its unfortunate liability to oxidation, as cement has proved itself one of the best preservatives of iron. The very thin layer of cement surrounding the iron forms a silicate with it, very difficult to separate, which explains why iron in cement mortar does not oxidize. Not only does cement preserve iron, but actually frees it from rust, as experiments have proved that iron bars covered with rust, if placed in cement mortar, become, after a time, perfectly clean.

A structure of the foregoing description consequently combines all the good qualities of stone, its strength and immunity from injury by the weather, with the elasticity of the iron, and daily increases in strength rather than deteriorates.

The advantages of this system compared with other methods are:—

1. Quickness of erection without prejudice to durability and security of the work.
2. Immunity from injury by water.
3. Extraordinary power of resisting very high and variable temperatures.
4. Great strength.
5. Lightness as compared with other structures in iron or concrete alone.
6. Saving in space.
7. Cheapness and neatness.

That a building material of such splendid qualities has found a very extensive application is not to be wondered at. It has already been successfully applied to bridges, sewers, reservoirs, roofs, arches, walls, floors, stairs, columns, &c.

The invention and introduction of this system has placed at the disposal of the engineering profession a building material which has, in the last few years, revolutionised the construction of bridges, culverts, tunnels, and all structures in which the principle of the arch is employed.

Where only a limited height is available for such structures, and where strong brick arches with great versed sine are inapplicable, this system offers an excellent means of overcoming the difficulty. The iron network is placed close to the intrados of the arch, as the same is there subject to tension. The stronger bars, vertical to the springing (except in skew arches), are extended into the abutments, which are preferably built of concrete. An arch is hereby created, immovably fixed at each end, which from the nature of its construction exerts a less horizontal thrust against its abutments than concrete, brick, or stone arches.

It

It has been proved by many tests made by Professor Bauschinger and others that a structure of cement mortar with iron rods inserted in the places where it is subject to tension acts as an elastic body, and that, therefore, the formulæ for the calculation of the strength of elastic bodies are applicable in its case.

In addition to the advantages already mentioned, arches built on this principle possess the following additional advantages over those built on other principles:—

1. Lightness of staying and centering for erection.
2. Simplicity in the construction of skew arches.
3. Their cheapness renders them available in many instances in which expensive iron structures have hitherto been the only means of overcoming the engineering difficulties.
4. The cost of maintenance is reduced to a minimum.
5. The portability of the materials for this system of construction renders it applicable in districts where suitable building materials cannot be obtained, and where their transport or the carriage of iron structures is surrounded with difficulty.

The cement and iron bars required for buildings on this principle are easy of carriage, and the sand for the mortar is easily obtained in most localities.

#### SYSTEM AS APPLIED TO BRIDGES.

Reconstruction on this system of eight overhead bridges on the Liesing to Felixdorf line of the Austrian South Railway Company.

THE reconstruction of arched overhead bridges on the line of the Austrian South Railway Company was found necessary, as the headway of the existing bridges was insufficient to accommodate a new type of rolling-stock which was introduced. Altogether ten overhead bridges on the Liesing to Felixdorf line had to be altered, four of which were situated at stations and six on the main line.

Of the four bridges at the stations, three required widening as well as increase of headway to meet the requirements of the traffic.

As these alterations involved a large outlay of money, the means of ensuring stability of construction without undue expenditure had to be carefully gone into. Various methods of overcoming the difficulty were considered, and a short account of the objections to them will no doubt be interesting.

1. *Lowering the permanent way.*—With the four bridges at the stations this was out of the question, as it would have entailed the lowering of the station buildings. In the case of the remaining six bridges, with one exception, this plan was found impracticable on account of the drainage of the surrounding country.

2. *Substitution of flat segmental brick arches for the existing elliptical arches of the same material.*—On this plan very thick arches would have been needed, whose great weight would have entailed very massive centering which would have blocked the traffic on the lines. This plan would also have entailed the strengthening of the abutments to meet the increased thrust against them. To accommodate the extra thickness of the arch would have necessitated the raising of the street levels, which in most cases was out of question.

3. *Substitution of iron superstructures for the existing arches.*—This plan proved too expensive, and in the case of the bridge near Mödling it was inadmissible, as the Government authorities insisted upon the lowering of the street level over the bridge.

In the case of the bridge at Leobersdorf station only was it found practicable to substitute an iron bridge of 55 feet 9 inch span for the existing brick arches. Under the circumstances it was necessary to find a more suitable form of construction than any of the foregoing. The reconstruction of the remaining bridges on this new system now came under consideration, and inquiries as to its suitability were ordered to be made in Germany, where the system had been employed in constructions of the most diverse character.

The result of this inquiry was embodied in a report by Engineer Carl Prenninger, which, while dealing principally with works executed at Berlin, Leipsic, Dresden, and Munich, goes fully into the question of the possibility of overhead bridges for vehicular traffic being constructed on this principle.

The greatest number of the works inspected during the course of the inquiry pertain properly to the building department, but some, such as the weir near Pirna, in Saxony, were entirely subject to the influence of the weather, and were reported to have satisfactorily answered the purpose for which they were intended. Professor Bauschinger, of Munich, expressed himself very favourably on this system, and did not doubt its successful application to road bridges, as experiments made by him with arches had given results hardly to be credited.

Professor Bauschinger, of Munich, gives the result of a test of an arch on this system in the following table.

The dimensions of the arch experimented upon were:—

Span = 32·8 feet.  
 Versed sine = 3·28 feet.  
 Width = 3·28 feet.  
 Thickness =  $3\frac{3}{8}$  to  $4\frac{3}{8}$  inches.

It had a single iron network composed of 19 longitudinal or main rods of  $\frac{3}{8}$  inch diameter, and 180 cross-rods  $\frac{22}{16}$  inch diameter and 158 of  $\frac{5}{16}$  inch diameter, forming a  $2\frac{3}{8}$ -inch mesh from centre to centre of rods. The main or longitudinal rods were 12·30 feet long, jointed where necessary by overlapping about 9 inches, and bound together by thin wire, but arranged so as to break joint. The abutments were of concrete, and connected by two tie-rods.

In testing, the arch was first loaded with a layer of pig-iron equally distributed over its entire length and then unloaded, first the one then the other half. The arch was then reloaded with layers of pig-iron, first the right and then the left half, and so on until eight layers were piled upon it. No more pig-iron being available, bundles of wires 11 ft. 6 in. long, and weighing 55 lb. each, were placed on top twenty-one pieces deep at a time, loading first the right, then the left, and last the middle. Three layers of wire bundles were piled on without fracturing the arch. This was only effected by removing wire and pig-iron to the extent of 7,968 lb. weight from one side of the arch, thus causing a one-sided load. The deflections due to the loading and unloading were recorded at nine stations marked A to I, 3·28 feet apart, the first being situated 3·28 feet from the abutment, so that station E came in the centre of the span.

The results of these tests are recorded in the accompanying table, in which "x" denotes lateral and "y" vertical deflections. The positive sign prefixed to these values indicates a movement of the point to the right or upwards respectively, the negative sign, to the left or downwards respectively. The zero point of each gauge was adjusted to the centre line of the unloaded arch previous to testing. The arch was erected 13th July, 1889, and tested 7th October of the same year.

As there was, however, no structure in existence similar to those proposed to be erected by the railway authorities, the Austrian Government insisted on a trial arch being erected and submitted to severe trial loads before sanctioning their erection.

The Railway Company selected Matzleindorf goods station, and built an arch of the dimensions shown on attached drawing, completing the work on the 19th October, 1889.

On the 10th December, 1889, the Railway Company tested the bridge in presence of a Commission of Government officers, and again on the 16th and 17th May, 1890. Both tests giving such favourable results as to dispel all doubts as to the suitability of the system for bridges, the Austrian Government, acting on the recommendation of the Commission, permitted the construction of the overhead bridges on the new system.

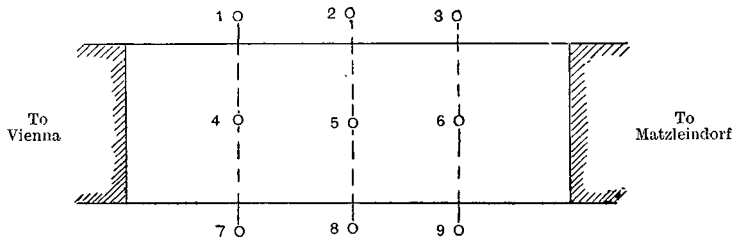
*First trial tests of the experimental arch constructed on this system at Matzleindorf goods station, 10th December, 1889.*

The dimensions of the arch were as under:—

Span = 32·8 feet.  
 Width = 13·12 feet.  
 Thickness at crown = 5·91 inches.  
 „ near abutment = 7·87 inches.

The abutments were of brick, 6·56 feet thick, surrounded by 3·28 feet of concrete on top and back. The spandrel walls resting on the arch were of brick; the spandrel filling was of gravel, on which were laid 2 ft.  $7\frac{1}{2}$  in. apart the sleepers of a temporary line; a sleeper was thus placed directly over the crown of the arch. A joint in the rails occurred over the first quarter of the span from the left abutment. The arch was erected in a pit or excavation, so as to bring the rails over it, down to the level of the existing lines, and so allow the rolling stock in use to be run on to the arch for the trials. The arch

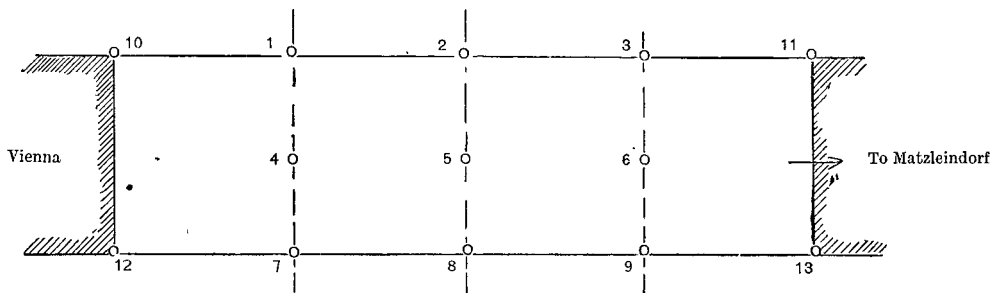
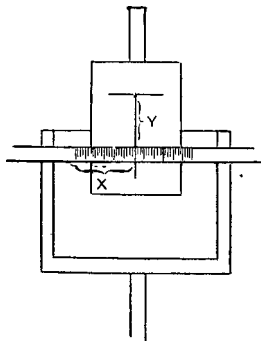
arch was erected on the 19th October. The weight of the rails was 72 lb. per lin. yard, and that of the whole dead load 2 cwt. 2 qr. 26 lb. per square foot. To measure the deflections of the arch, caused by the test loads, nine sliding scales were fixed, arranged in sets of three, one set in the first quarter of the span, one set in the centre, and one set in the third quarter of the free span. The following sketch shows the position, and distinguishing numbers of the different points of observation.



Eleven tests were made with the railway rolling stock, the loads being slowly run on to the arch and then removed. Particulars of the loads and deflections are given in the tables appended, and were in every respect satisfactory, as no cracks or evidence of strains could be discerned in any part of the arch.

*Second series of trial tests of the experimental arch on this system at the Matzleindorf goods station, 16th and 17th May, 1890.*

The arch was the same as was used for the first series of tests made on the 10th December, 1889. It being 210 days from date of erection, and 157 days from date of last test. The gauges used for observation in this series of tests recorded lateral as well as vertical movements of the arch, and are shown in the adjoining sketch.



Gauges were placed in the same positions as in the tests of 10th December, 1889, and also at the heels of the arch Nos. 10, 11, 12, 13. There were, therefore, five on each face of the arch, and three under the centre line of the bridge.

The tests were begun on 16th May, 1890, by shunting first a six-wheel, and then an eight-wheel locomotive on to the Matzleindorf half of the arch. As no damaging alterations of form took place the locomotive was removed, and the other (Vienna) half was loaded with a successively increasing load of rails. This load was increased until it reached 88 tons 7 cwt. 3 qr. 12 lb., equal to 8 cwt. 0 qr. 24 lb. per square foot, when the spandril walls commenced to separate from the Vienna abutment, the crack extending also through two-thirds of the thickness of the arch near the heel.

The load was then increased to 98 tons 4 cwt. 1 qr. 4 lb., or 9 cwt. 0 qr. 14 lb. per square foot, when cracks showed in both spandril walls, near the middle of the unloaded half. This load was maintained for three and a half hours, from 11.15 a.m. to 2.45 p.m., and then removed.

On the following day, 17th May, 1890, the load (No. 4 test) was reimposed and increased to 176 tons 15 cwt. 2 qr. 24 lb., when the Matzleindorf abutment began to crack considerably, in consequence of which the arch sank until it rested upon the underlying scaffold in several places.

The scaffold being lowered free from the intrados, the deflection still increased without the arch showing any further crack than that already mentioned as occurring at the Vienna abutment, but it was found that the top course of bricks in both abutments were completely crushed. The load was then increased to 192 tons 13 cwt. 3 qr. 20 lb., or 17 cwt. 3 qr. 18 lb. per square foot. The cracks increased, and both abutments were pushed out from  $\frac{3}{4}$  in. to  $1\frac{1}{2}$  in., in consequence of which the deflection of the arch increased so that it again took a bearing upon the scaffold below in several places, and showed a crack on the lower side or intrados of the unloaded half at about 1 ft. 7 $\frac{1}{2}$  in. from the crown, and extending over the whole width of the arch, indicating its complete destruction.

If the dimensions of a concrete arch constructed without iron network are calculated like an iron arch, when tested it will give results quite at variance with what the calculations would lead one to expect, the actual strength being always greater than the theoretical.

With, moreover, an iron network inserted, there is a further considerable increase in strength, as comparative tests of ordinary concrete arches and arches on this system have proved, where the latter have borne from five to six times greater loads than the ordinary concrete arch of equal dimensions.

The proposed overhead bridges were so designed that the concrete arch without an iron lattice network would be able to carry with safety the normal load for first-class street bridges. In addition, an iron network was inserted throughout the arch, and an additional one, extending from the heel to the first eighth of the arch of such dimensions, as to be able of itself to withstand the tensile and part of the compressive forces. The dimensions thus arrived at would give altogether about twenty times the required strength.

It will be as well to explain the reason for inserting an additional iron network in the upper side of the arch from the heel to the first eighth of the arch.

Let the arch be so constructed that the line of equilibrium coincides with the centre line of the arch when the ordinary working load is equally distributed over the whole span. If the whole load be now equally distributed over one-half of the span, allowing the horizontal thrust to remain equal, the equilibrium line will be altered, and the greatest deviation can be expressed by the formula of Müller-Breslau—

$$\frac{pl^2}{64 Q}$$

where p = working load per square foot.  
 l = the span.  
 Q = horizontal thrust.

The

The deviations of the equilibrium line from the centre line of the arch can be determined by the ordinates of a parabola constructed over half the span. The line of equilibrium will assume the position shown on plate attached. This figure shows plainly that in the first eighth of the arch the line of equilibrium of the loaded half lies underneath the centre line of the arch, so that tensile struts are created in the back of the arch, to counterbalance this tensile strain an iron network was inserted near the outside surface of the back of the arch.

This second iron network, of the same dimensions as the main one, reached 2 feet into the abutment, and about 1 foot over the first eighth of the arch. As the bridge near Modling was the largest and also the first to be reconstructed, a full description of the demolition of the existing and erection of the new spans at that place will be of interest. After erecting a temporary wooden bridge to divert the street traffic, the work of demolition was commenced. The railway traffic, which was very heavy (intervals of a quarter of an hour being exceptional), could on no account be interrupted, and as in consequence of the limited headway no scaffolding could be used, and everything had to be handled in a very limited space, this part of the work proved the most difficult and exciting, and it was only through the faithful fulfilment of their duty by all persons engaged in the work that no accident happened, and that during the whole period not a single train was delayed by the work.

The existing bridge connected Old and New Modling, crossing the railway line at an angle of about 70 degrees by three spans, giving space for four lines of rails. The new bridge crosses at the same angle, and has also three spans, but admits of six lines of rails, two in each bay.

The dimensions are —

|                                   |                     |
|-----------------------------------|---------------------|
| Width of spans . . . . .          | = 29 ft 6½ in each. |
| Versed sine . . . . .             | = 3 ,, 7¼ ,,        |
| Thickness at crown . . . . .      | = 6 inches.         |
| Thickness near abutment . . . . . | = 12 ,,             |
| Total width . . . . .             | = 36 ft 5 in.       |
| Width of carriageway . . . . .    | = 26 ,, 3 ,,        |
| Width of footways . . . . .       | = 10 ,, 2 ,,        |

When the pulling down was completed, the erection of the centre piers and abutments, containing about 956 cubic yards of concrete, was proceeded with and finished in twelve days.

The centering for the new arches was then commenced, and was arranged as follows — Twenty four ribs for each arch were formed of 12½-inch by 2½-inch planks, four to each rib, securely fastened together by bolts and nuts. The ribs were placed 2 ft. 4½ in apart from centre to centre at right angles to the lines of rails, and were supported at the ends by longitudinal bearers running along the sides of the piers and abutments, and resting upon capsills parallel to them. Between the bearers and capsills were placed the wedges for adjusting the centering. The capsills were secured to uprights resting upon and morticed into groundsills. Owing to the skew of arch, the three outside ribs of either end of each bay received no support from the piers or abutments, and their supports were, therefore, strengthened by struts extending from the capsills to the ground. After covering the ribs with 1½ inch lagging, a fascia board was fixed in position to form the face of the arch.

The centering was now ready for the construction of the arches.

The proportions of materials in the cement mortar and concrete were specified to be the same as in the trial bridge at Matzleindorf, viz. —

For the arch—1 Portland cement ; 3 clean sand.

For the abutments—1 Portland cement ; 4 clean sand ; 6 broken stone.

The cement used had given satisfactory results on other important works, and had established for itself a reputation for tensile and compressive strength and constancy of volume.

The specification provided that on completion of the work the contractors were to be paid 90 per cent. of the contract price, and were to maintain the work for a period of three years, receiving the balance of contract money, 10 per cent., at the end of twelve months, and then to give a guarantee for the maintenance at their own cost for the remaining two years.

About 459 cubic yards of cement mortar were required for the arches and 215 cubic yards of concrete for the piers and abutments, for the remaining portion above the springing line of the arches, and mixing was performed by two of Amann's concrete mixers, driven by a steam engine. The mixers were placed on the approaches to the bridge, and a cart track was constructed from them along the middle of the work to ensure quick transmission of the concrete and cement mortar to the spot where it was to be used.

The erection of the arches was done in the following manner —

The longitudinal iron rods and the transverse ones, bound together so as to form a net work of the desired mesh, were placed in position, supported at the requisite height above the lagging by flat stones laid at intervals on its surface.

The concreting of the arches was then commenced starting from both abutments, with mortar of 1 cement to 3 of sand.

The mortar thoroughly mixed and moistened to the consistency of moist earth, was spread over the network, and beaten into it with broad iron trowels until the water showed on the surface and the whole became a shaking mass. In this manner the concreting advanced towards the crown of the arch ; at the same time further layers were being added, always commencing from the abutments. These last layers were punned with flat iron rammers, used at right angle to the extrados of the arch. When the proper height was reached, the second netting was put in position, and concreted over in the same manner. When the intended thickness of the arch was attained, the surface was smoothed down, again beaten with the trowel, and lightly rubbed, so as to leave a smooth and compact surface.

The three arches were completed in two days, so that only one month elapsed from the commencement of the work to the finishing of the arches. During the two days 197 cubic yards of concrete and mortar were used.

During the following days the erection of the spandrel face walls and spandrel filling over the arches with concrete was executed, and then a layer of 3 inches of sand was spread over the arches, and kept constantly moist. The weather was unfavourable, inasmuch as the temperature reached 111 degrees Fahr. during the concreting of the arches, necessitating more copious watering than is usually the case. In spite of all precautions, the cement-mortar dried in places before the succeeding layer could be spread over it. In such cases a watering of cement water was used to ensure the proper union of the layers.

Two weeks after the completion of the arches, the centering was struck, but its removal proved a tedious job, for when the wedges were drawn, it was found that the centering had spread with the ramming of the cement mortar, and jammed the heels of the ribs against their abutments with sufficient force to sustain the whole centering in position, relieving the uprights entirely of its weight.

After the removal of the centerings, the remaining seven bridges were proceeded with, and only a sufficient number of workmen retained to complete the roadway, and footpaths, &c, over the bridge. The final examination of the bridge demonstrated the faultless condition of the structure, which was handed over to the public exactly two and a half months from the commencement of the work. The completion of the whole of the eight bridges occupied little more than three months, and all of them gave entire satisfaction to the Railway Company.

#### *Road Bridge over the Canal of the Portland Cement Factory of R Zurlinden, Aarau (Switzerland)—Erected 1890.*

The bridge crosses the canal at an angle of 45 degrees, and has a clear span of 121 ¾ feet, measured at right angles to the abutments, and 171 63 feet along the face of the arch, with a versed sine of 11 feet 6 inches, and a width of 12 feet 9½ inches.

The thickness of the arch is 6½ inches at the crown, and 9½ inches near the abutments. The bridge was tested on the 14th November, 1890, in the presence of the President of the Zurich Association of Engineers, Mr Metzger, by submitting it to a load of 17 tons 19 cwt distributed over one-half of the arch equal to 61 lb per square foot.

No measurable deflection could be observed. At the conclusion of this test a waggon, loaded with sand, and drawn by four bullocks—a total weight of 5 tons 6 cwt—was driven across the bridge, but no vibrations in the opposite spandrel of the arch were recorded by the gauges.

The result of these tests being satisfactory, it was considered to be proved that the bridge would bear with safety the greatest load equally distributed over one half the span that could occur in practice, namely, a crowd of people, which would be equal to (700 48 x 92) 28 tons 15 cwt 1 qt 21 lb.

*Road Bridge across a Canal at Steyr (Upper Austria)—Erected 1890.*

The bridge crosses the canal at an angle of 60 degrees. The span is 52 ft. 5 in., with a versed sine of 9 ft. 7½ in. The thickness of the arch at the crown is 7½ inches, and near the abutment 11½ inches.

To test the bridge a heavily laden waggon drawn by four heavy horses, a total weight of 8 tons 7 cwt., was used. The greatest deflection recorded by gauges at three points of observation was ¼ inch, leaving a permanent deflection of 1½ inch.

This result was considered satisfactory, as the bridge was designed to carry maximum loads of 3 tons 18 cwt.

*Road Bridge across the Galga at Püspök-Hatvan, near Aszod (Hungary)—Erected 1890.*

Span of bridge, 33 ft. 5½ in., with a versed sine of 3 ft. 7½ in. The arch is 6½ inches thick at the crown. The arch and spandrel walls are constructed on this system. The abutments and foundations are of concrete.

Designed for a load of 2·94 tons per wheel, and 92 lb. per square foot if loaded with a crowd of people.

*Road Bridge across the Nador Canal, near Sarbogard, Hungary—Erected 1890.*

The bridge has a span of 59 feet, with a versed sine of 7 feet. The thickness of the arch at the crown is 7½ inches. The spandrel walls, abutments, and foundations are of concrete. Designed for a load of 2·94 tons per wheel, and 92 lb. per square foot if crowded with people.

*Bridge for Passenger Traffic erected at the North-West German Trade and Industry Exhibition at Bremen, 1890.*

The span of the arch is 131 ft. 2¾ in., with a versed sine of 14 ft. 9 in. The width of the bridge at the crown of the arch was 9 ft. 10½ in., widening towards the abutments, where it was 26 ft. 3 in. The thickness of the arch at the crown was 9½ inches, and 21½ inches near the abutment. The bridge spanned an artificial sheet of water, and being at a considerable elevation above it, was approached at either end by a flight of steps 14 ft. 9 in. wide, constructed on the extrados of an arch whose thickness was 2 inches. The proportions of the bridge were designed for a working load of 204 lb. per square foot with a safety co-efficient of 10. It was erected within six weeks, during the spring of 1890, as an exhibit. The arch being constructed in thirty-six hours. It was taken down in the beginning of 1891 by cutting the arch through at the crown.

*Railway Bridge across the Canal of Portland Cement Factory, at Neustadt, Western Prussia—Erected 1890.*

The bridge has a span of 42 feet, with a versed sine of 7 feet. The thickness of the arch at the crown is 8 inches and near the abutment 12 inches.

The abutments and foundations are of concrete, and the spandrel walls of brick. The bridge is 14 feet wide, and carries two lines of rails, 2-ft. 4-in. gauge, for the transport of cement from the factory to the Neustadt railway station.

The bridge is calculated for a working load of 204 lb. per square foot, with a safety co-efficient of 10. The filling over crown of arch amounted to 12 inches.

## SYSTEM AS APPLIED TO CULVERTS, TUNNELS, AND PIPES.

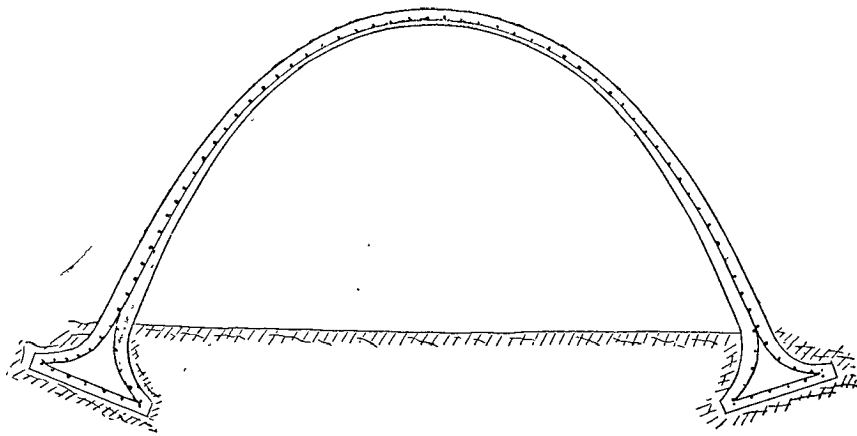
## APPLICATION TO CULVERTS, TUNNELS, AND PIPES.

A wide field for the use of this system presents itself in the construction of culverts and tunnels, the principle of the system admitting of so many different forms of section that it can be applied in the form which by calculation is found will best meet the requirements of each particular case.

In the case of a tunnel or a culvert through an embankment where the depth of the superincumbent material above the crown equals or exceeds the vertical height of the opening of the culvert, a semi-elliptical form of cross-section will be advisable, both on account of strength and economy.

Its form and thickness should be such that under the uniform maximum load the equilibrium line will be identical with the centre line of the arch. To counterbalance unforeseen tensile stresses, caused, for example, by a heavy rolling load, or by an unequal pressure of the filling, an iron network must be inserted in the arch near its inner surface.

If the foundation for the springing of the arch is rock or ordinary good material, the ends of the arch may be widened to give a sufficient bearing or base, as shown in the figure:—



The width of the base will, of course, depend upon the nature of the foundation, and it is constructed with an iron network close to its three surfaces, to ensure safety against tensile stresses at any point of it.

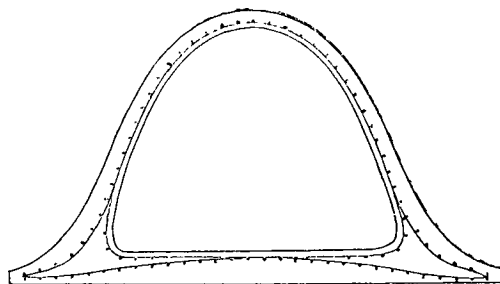
If, on the contrary, the foundation of the tunnel or culvert is soft and yielding, the ends of the arch must be tied together, as shown in the figure opposite, by a plate on this system, which forms the floor of the tunnel or culvert.

This floor or base acts like a girder, subject to a load pressing from below, and whose points of support are the ends or heels of the arch. If the foundation is very soft, it is often found necessary to extend this plate beyond the heels of the arch, an iron network being inserted in the position indicated in the figure.

When culverts have a sectional area of less than 24 square feet (say under 6·6 feet diameter), it is better to construct them as pipes.

When preparing alternative estimates, in 1888, for the drainage of the town of Königsberg, in Prussia, Mr. Krause, the Government Engineer, made some instructive experiments with pipes constructed on this system. He started with the supposition that the conduit, or pipe-line, when complete, would, unlike pipes surrounded by water or pure sand, be subject to pressure from the superincumbent and surrounding filling varying at different points of the same cross-section.

It was necessary, therefore, to ascertain with accuracy where tensile strains would be brought into play, and to arrange the network to counteract it. He found by calculation and experiments, that the strains were greatest at the crown, the invert, and at the extremities of the horizontal diameter, decreasing in the quadrants and becoming 0 at the middle of the quadrants, so that at the crown and invert the inner surface was subject to tension, and at the points opposite to them the outer surface of the pipe was in tension. To counteract these stresses, then, the network would have to be elliptical in shape. This was awkward to make, and in addition there was the risk of unskilled workmen laying the pipes with the wrong side up. It was, therefore, decided to make the pipes with two wire nettings, one near the inner, the other near the outer surface. A pipe, 6 ft. 6 in. diameter, 5 feet long, and 4 inches thick, was constructed in this way, and submitted to a severe trial in the following manner by Mr. Krause:—





A trench was excavated 12 feet wide by 6 feet long, and about 3 feet deep, and filled in again with loose earth, turf, &c. A concrete plate, 7 ft. 6 in. x 5 ft 0 in x 9 $\frac{1}{2}$  in., was laid on top in the centre, and on this the pipe was placed for testing.

The load applied consisted of sandbags, arranged round the sides of the pipe, and retained in position by wooden bulkheads at each side shoved up by struts. The load on top was partly sandbags and partly iron rails.

The pipe was constructed on the 19th November, 1887, and tested between the 16th and 20th April, 1888.

With a top load of 17.5 cwt per square foot the concrete-plate beneath the pipe cracked in the middle, but the pipe remained free of cracks, only showing a reduction of  $\frac{1}{8}$  inch in the vertical height, and an increase of an equal amount in the horizontal diameter. The whole mass sank 2 inches.

With a top load of 23.5 cwt. per square foot the first hair-cracks in the pipe were caused. These occurred on the inside of the pipe exactly at the crown and invert; the diminution of the vertical diameter and the increase of the horizontal diameter being each  $\frac{1}{16}$  inch. The whole mass sank 3 inches.

A further increase of the load caused hair-cracks on the outside surface at the extremities of the horizontal diameter.

With a top load of 38.7 cwt. per square foot the deflections of the diameters were respectively — and + 2 $\frac{3}{8}$  inches. The whole had sunk 9 $\frac{1}{2}$  inches. On removal of the load the pipe showed permanent alteration of the diameters of 2 inches. The cracks did not extend through the thickness of the pipe, but reached only to the middle, either from the inside or the outside.

A second pipe of equal diameter and thickness, but only 3 ft. 3 $\frac{1}{2}$  in. long, closed at both ends with zinc-lined wooden plates, was subjected to an inside pressure by water. As the wooden plates did not make a very tight joint, only a mean pressure of 24.5 feet head of water could be applied, which the pipe stood very well, inasmuch as it only caused water to sweat through at a few places.

These pipes have the advantage that they can be manufactured to any bend or curve required without any difficulty, and without increasing the cost to any considerable extent. The attached drawing shows a pipe-drain under a railway embankment following the natural depression of the ground.

Up to 12 inches the price of these pipes is pretty much the same as common cement pipes, but a saving of 10 to 12 per cent. is effected in larger pipes. The weight of a cement pipe of 3.28 feet diameter is, per lineal foot, 504 to 571 lb.; a pipe on this principle of the same diameter weighs only 215 lb. per lineal foot.

A sewer of 48.5 chains length and 4.92 feet diameter was constructed at Offenbach, Germany, in the year 1886, and showed, when inspected by the authorities in 1890, neither injury to the cement, mortar, nor oxidizing of the iron.

#### *Culvert on the Great Venezuela Railway, La Guayra to La Victoria.*

This railway winds along the mountain slopes, and crosses numerous creeks and gorges, which, during the time of the tropical rains, have tremendous quantities of water to discharge.

The drawing attached shows one of the largest size of culverts constructed. It has a clear width of 32 feet 10 inches and a height of 16 feet 6 inches.

#### *Double Culvert on the road from Budapest to Semlin, in the Municipality of Solt, Hungary—Erected 1889.*

The width of both parabolic arches is 16 feet 5 inches, with a height of 9 feet 10 inches. The width of roadway is 19 feet 6 inches. Spandrel walls, wing walls, and foundations are built of concrete.

Designed for a load of 2.94 tons per wheel, and 92 lb. per square foot if loaded with a crowd of people. The culverts were tested 10th December, 1889, by a one-sided load of 178 lb. per square foot, without any measurable deflections being observable.

In consequence of floods, combined with strong ice drift, in the Danube, 1891, breaking the dams, the road was completely submerged, without damaging the culverts in the least.

#### *Culvert under the Embankment of the Steam Tramway at Tellow—Erected 1890*

This culvert, 36 feet long, is built in the form of a parabola, with a width at the invert of 6 ft. 6 $\frac{3}{4}$  in., and a height of 4 ft. 11 in. The thickness of the arch at the crown is 4 inches, near the foot 6 inches. The wing walls at both ends of the culvert are likewise erected on this system, and are strengthened by ribs. The culvert, resting on a gravel filling of 3.28 feet, necessitated by the boggy nature of the ground, is covered with 3 ft. 9 in. of filling.

#### *Culvert overbridging the Hungarian North-East Railway at Borsó, near Satorallya-Ughely—Erected 1891.*

The arch has a span of 42 ft. 7 $\frac{1}{2}$  in. and a height of 16 ft. 2 in. Designed for a load of 2.94 tons per wheel, or 92 lb. per square foot if crowded with people.

### SYSTEM AS APPLIED TO IRON BRIDGES

#### APPLICATION IN FORM OF PLATES AND SEGMENTAL ARCHES IN CONNECTION WITH IRON BRIDGES.

In the last few years this system has gained considerably in favour as a bridge decking in connection with iron structures, as it is lighter than brick or concrete, allowing of lighter sections of iron, more durable than buckled plates, corrugated iron, or wood-decking. Segmental arches are used for the roadway and plates for the footpaths.

These segmental arches are used up to a span of 16 ft. 6 in., with thicknesses accordingly.

An arch of 6-foot span and 1 $\frac{1}{2}$ -inch thickness tested gave the following results:—

|  |    |    |                      |
|--|----|----|----------------------|
| A load of 2,000 lb. caused a deflection of | .. | .. | $\frac{5}{16}$ inch. |
| "   2,900 lb.   "   "   "   "   "          | .. | .. | $\frac{7}{8}$ "      |
| "   3,300 lb.   "   "   "   "   "          | .. | .. | $\frac{1}{2}$ "      |

The load removed, the arch completely regained its former position. Twenty days later the same arch was loaded with 12,000 lb., which caused a deflection of  $\frac{3}{4}$  inch, being caused to a certain extent by the supports giving way about  $\frac{1}{8}$  inch. The arch showed, after removal of the load, a permanent deflection of  $\frac{3}{8}$  inch.

The results of two more tests are shown on accompanying drawing, fig. 1 and fig. 2.

A plate on supports 6 feet apart with a thickness of 2 inches was tested nine days after construction.

|  |    |    |    |    |    |                      |
|--|----|----|----|----|----|----------------------|
| A load of 873 lb. caused a deflection of | .. | .. | .. | .. | .. | $\frac{3}{16}$ inch. |
| "   1,183   "   "   "   "   "            | .. | .. | .. | .. | .. | $\frac{1}{8}$ "      |
| "   1,737   "   "   "   "   "            | .. | .. | .. | .. | .. | $\frac{1}{8}$ "      |
| "   2,477   "   "   "   "   "            | .. | .. | .. | .. | .. | $\frac{1}{4}$ "      |
| "   2,857   "   "   "   "   "            | .. | .. | .. | .. | .. | $\frac{1}{4}$ "      |

Although the last load amounted to 238 lb. per square foot, no injury was done to the plate, which, after the removal of the load, went almost completely back to its original position, only leaving a permanent deflection of  $\frac{1}{8}$  inch. A similar plate, but of cement mortar alone, was not able to carry its own weight when placed on supports 6 feet apart.

A similar plate to that above mentioned, but on supports 3 ft. 10 in. apart, showed a fine crack at the under side when subjected to a load of 9,000 lb. When this load, in which was included five men, was set moving, it cracked the plate, which, notwithstanding this, carried the load, showing only a deflection of 1 $\frac{1}{2}$  inch.

A plate 3 $\frac{1}{2}$  inch thick with a more ingenious lattice, and supported 3 ft. 9 in. apart, carried a load of 18,000 lb. on 11.7 square feet, or 1,538 lb. per square foot. This load caused a deflection of  $\frac{1}{2}$  inch without cracking the plate or causing any other damage.

#### *Spittel Bridge, near Jessnitz (Germany)—Erected 1891.*

Between the cross I irons 9 feet apart are spanned segmental arches, the spandrels of which, to top of girders, are filled in with concrete, and on this a layer of asphalt concrete is spread. The roadway is 12 ft. 9 in. wide, the footpaths 6 ft. 6 in. The latter are covered with plates. The bridge is calculated for heaviest traffic.

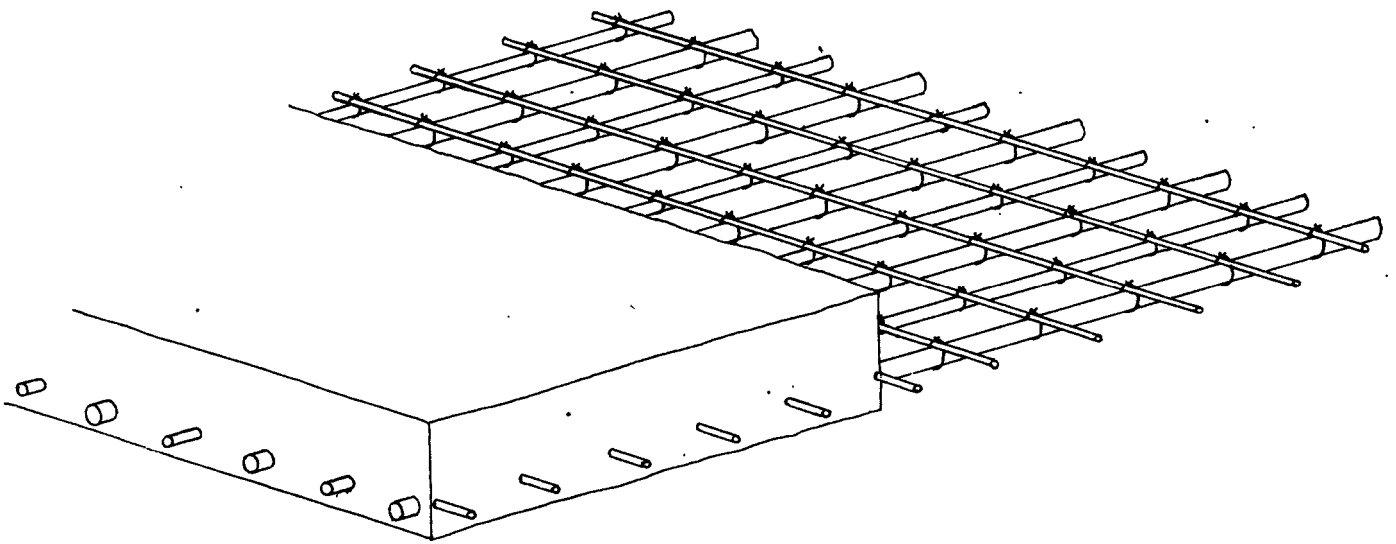
#### *Iron Bridge across the Lahn at the Iron Foundry of Buderus, near Wetzlar (Germany)—Erected 1887.*

Between the I irons 2 ft. 3 $\frac{1}{2}$  in. apart of the roadway are spanned arches of 2 inch thickness and 3 $\frac{1}{2}$ -inch versed sine, stiffened off at the I with concrete, covered with pumice-stone concrete to the top of the I irons, and then metallized.

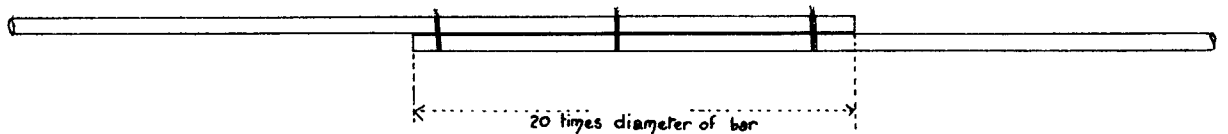
The construction is calculated for 2.94 tons pressure per wheel. The footpaths are 4 ft. 7 $\frac{1}{2}$  in. wide, and formed of plates which rest on C irons fixed on top of the girders.

Plate I.

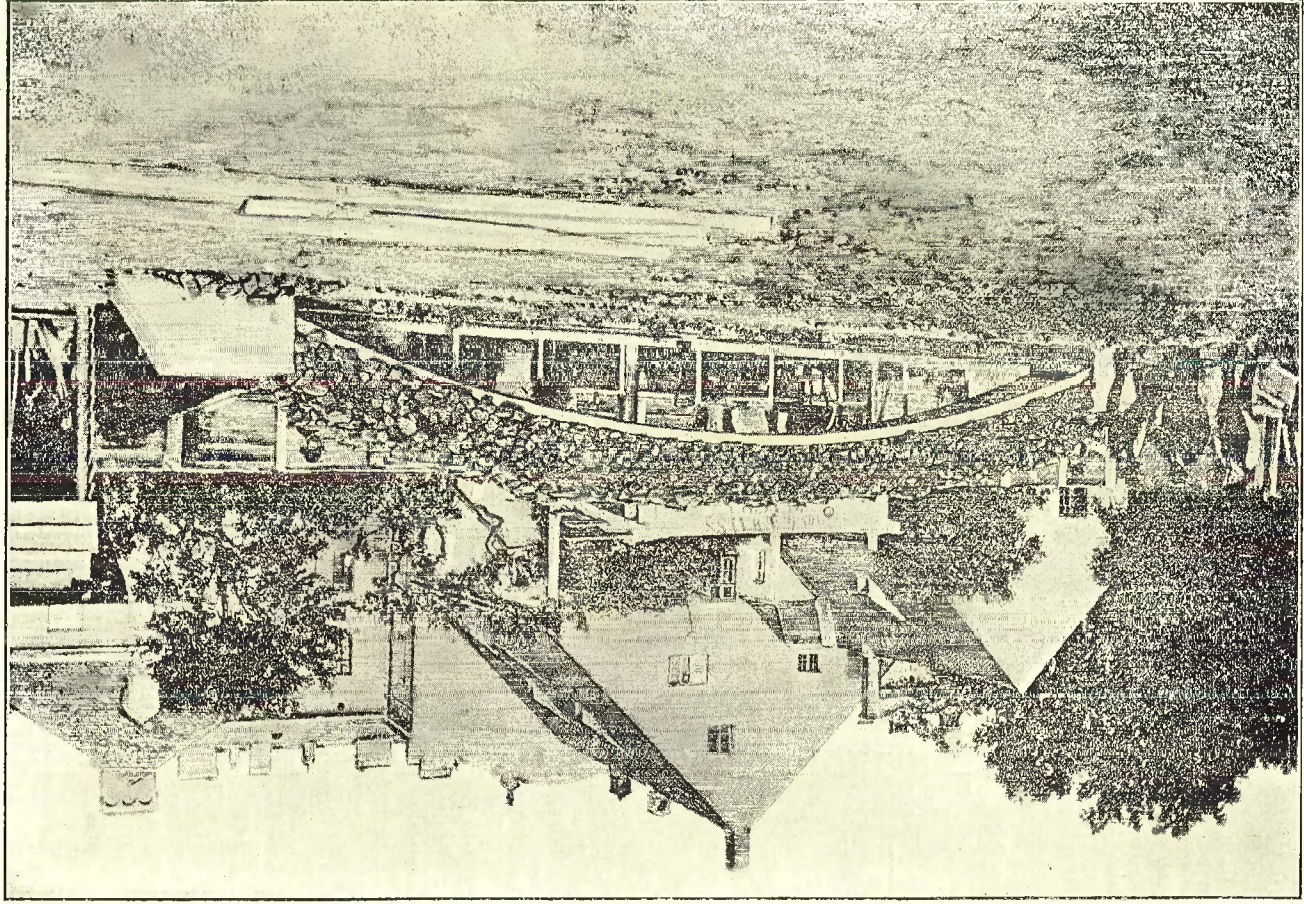
Detailed view showing  
method of placing and securing lattice work



Method of joining bars



(140-)



TEST BY PROFESSOR BAUSCHINGER.

Plate II.



# TRIAL TEST OF A COMPOSITE ARCH OF 32.8 FT SPAN

by Prof. Bauschinger. Munich.

| TOTAL LOAD |      |       |      | LOAD PER SQUARE FOOT |      |       |      | A      |        | B      |        | C      |        | D      |        | E      |        | F  |        | G      |        | H      |        | I      |        | REMARKS |       |        |       |       |       |        |        |       |        |  |  |  |  |  |  |  |  |  |  |
|------------|------|-------|------|----------------------|------|-------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|--------|--------|--------|--------|--------|--------|--------|---------|-------|--------|-------|-------|-------|--------|--------|-------|--------|--|--|--|--|--|--|--|--|--|--|
| Left       |      | Right |      | Left                 |      | Right |      | x      | y      | x      | y      | x      | y      | x      | y      | x      | y      | x  | y      | x      | y      | x      | y      | x      | y      |         |       |        |       |       |       |        |        |       |        |  |  |  |  |  |  |  |  |  |  |
| Tons       | Cwts | Qrs   | Lbs. | Tons                 | Cwts | Qrs   | Lbs. | Tons   | Cwts   | Qrs    | Lbs.   | Tons   | Cwts   | Qrs    | Lbs.   | Tons   | Cwts   | Qrs  | Lbs.   | Tons   | Cwts   | Qrs    | Lbs.   | Tons   | Cwts   |         | Qrs   | Lbs.   |       |       |       |        |        |       |        |  |  |  |  |  |  |  |  |  |  |
|            |      |       |      |                      |      |       |      | INCHES | INCHES | INCHES | INCHES | INCHES | INCHES | INCHES | INCHES | INCHES | INCHES | INCHES   | INCHES | INCHES | INCHES | INCHES | INCHES | INCHES | INCHES |         |       |        |       |       |       |        |        |       |        |  |  |  |  |  |  |  |  |  |  |
| 2          | 11   | 1     | 9    | 2                    | 12   | 3     | 8    |        |        | 3      | 23     |        |        | 3      | 26     | +0.03  | -0.004 | 0.00   | 0.00   | +0.02  | -0.03  | 0.00   | -0.04  | -0.01  | -0.05  | +0.01   | -0.04 | +0.004 | -0.04 | 0.0   | -0.03 | 0.0    | +0.04  |       |        |  |  |  |  |  |  |  |  |  |  |
| 2          | 11   | 1     | 9    | 0                    | 0    | 0     | 0    |        |        | 3      | 23     |        |        | 0      | 0      | +0.03  | -0.05  | +0.03  | -0.09  | +0.08  | -0.11  | +0.06  | -0.10  | +0.04  | -0.02  | +0.05   | +0.06 | +0.02  | -0.09 | +0.01 | +0.08 | -0.07  | +0.04  |       |        |  |  |  |  |  |  |  |  |  |  |
| 0          | 0    | 0     | 0    | 0                    | 0    | 0     | 0    |        |        | 0      | 0      |        |        | 0      | 0      | 0      | 0      | 0  | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0       | 0     | 0      | 0     | 0     | 0     | 0      | 0      |       |        |  |  |  |  |  |  |  |  |  |  |
| 0          | 0    | 0     | 0    | 2                    | 12   | 3     | 8    |        |        | 0      | 0      |        |        | 3      | 26     | -0.01  | +0.04  | -0.03  | +0.11  | -0.02  | -0.14  | -0.03  | +0.09  | 0.00   | -0.02  | -0.02   | -0.12 | -0.07  | -0.17 | -0.02 | -0.16 | -0.004 | -0.06  |       |        |  |  |  |  |  |  |  |  |  |  |
| 2          | 11   | 1     | 9    | 2                    | 12   | 3     | 8    |        |        | 3      | 23     |        |        | 3      | 26     | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | -0.01  | -0.03  | -0.02  | -0.05  | -0.02   | -0.06 | -0.04  | -0.07 | -0.08 | -0.02 | +0.01  | -0.004 |       |        |  |  |  |  |  |  |  |  |  |  |
| 2          | 11   | 1     | 9    | 4                    | 19   | 0     | 18   |        |        | 3      | 23     |        |        | 1      | 3      | 11     | -0.01  | +0.04  | -0.03  | +0.08  | -0.04  | +0.10  | -0.03  | -0.04  | -0.06  | -0.08   | -0.04 | -0.16  | -0.06 | -0.21 | -0.02 | -0.13  | -0.004 | -0.06 |        |  |  |  |  |  |  |  |  |  |  |
| 4          | 18   | 0     | 20   | 4                    | 19   | 0     | 18   |        |        | 1      | 3      | 8      |        |        | 1      | 3      | 11     | 0.00   | 0.00   | +0.01  | -0.03  | +0.02  | -0.05  | +0.04  | -0.10  | -0.02   | -0.12 | 0.00   | -0.12 | -0.03 | -0.11 | +0.02  | -0.05  | +0.03 | 0.004  |  |  |  |  |  |  |  |  |  |  |
| 4          | 18   | 0     | 20   | 7                    | 7    | 1     | 23   |        |        | 1      | 3      | 8      |        |        | 2      | 2      | 27     | -0.01  | +0.02  | -0.02  | +0.06  | -0.004 | +0.05  | +0.004 | -0.02  | -0.02   | -0.15 | -0.04  | -0.24 | -0.05 | -0.27 | -0.02  | -0.17  | +0.03 | -0.07  |  |  |  |  |  |  |  |  |  |  |
| 7          | 2    | 1     | 16   | 7                    | 7    | 1     | 23   |        |        | 2      | 2      | 16     |        |        | 2      | 2      | 27     | -0.01  | -0.02  | -0.01  | -0.05  | 0.00   | -0.09  | -0.02  | -0.16  | -0.02   | -0.20 | -0.004 | -0.21 | -0.01 | -0.20 | +0.02  | -0.09  | +0.03 | -0.004 |  |  |  |  |  |  |  |  |  |  |
| 7          | 2    | 1     | 16   | 9                    | 13   | 3     | 18   |        |        | 2      | 2      | 16     |        |        | 3      | 2      | 11     | -0.03  | +0.02  | -0.02  | +0.02  | -0.02  | -0.01  | -0.02  | -0.11  | -0.03   | -0.24 | -0.02  | -0.31 | -0.04 | -0.32 | -0.004 | -0.20  | +0.04 | -0.07  |  |  |  |  |  |  |  |  |  |  |
| 9          | 7    | 0     | 9    | 9                    | 13   | 3     | 18   |        |        | 3      | 1      | 25     |        |        | 3      | 2      | 11     | -0.01  | -0.03  | +0.01  | -0.10  | +0.03  | -0.18  | +0.02  | -0.26  | 0.00    | -0.33 | +0.02  | -0.31 | 0.00  | -0.25 | +0.05  | -0.11  | +0.09 | -0.01  |  |  |  |  |  |  |  |  |  |  |
| 9          | 7    | 0     | 9    | 12                   | 1    | 1     | 7    |        |        | 3      | 1      | 25     |        |        | 4      | 1      | 26     | -0.03  | +0.01  | -0.02  | -0.01  | +0.01  | -0.10  | -0.01  | -0.24  | -0.02   | -0.39 | -0.01  | -0.46 | -0.02 | -0.42 | +0.04  | -0.25  | +0.08 | -0.02  |  |  |  |  |  |  |  |  |  |  |
| 11         | 13   | 2     | 21   | 12                   | 1    | 1     | 7    |        |        | 4      | 1      | 10     |        |        | 4      | 1      | 26     | -0.03  | -0.05  | +0.07  | -0.15  | +0.07  | -0.13  | +0.03  | -0.42  | +0.04   | -0.50 | +0.06  | -0.47 | +0.03 | -0.36 | +0.09  | -0.16  | +0.15 | -0.01  |  |  |  |  |  |  |  |  |  |  |
| 11         | 13   | 2     | 21   | 14                   | 5    | 2     | 12   |        |        | 4      | 1      | 10     |        |        | 5      | 1      | 6      | -0.04  | -0.02  | -0.01  | -0.09  | +0.03  | -0.21  | +0.02  | -0.39  | +0.01   | -0.56 | 0.00   | -0.63 | 0.00  | -0.55 | +0.56  | -0.32  | +0.13 | -0.09  |  |  |  |  |  |  |  |  |  |  |
| 13         | 17   | 0     | 11   | 14                   | 5    | 2     | 12   |        |        | 5      | 0      | 17     |        |        | 5      | 1      | 6      | -0.02  | -0.06  | +0.03  | -0.21  | +0.09  | -0.40  | +0.06  | -0.57  | +0.04   | -0.68 | +0.06  | -0.65 | +0.05 | -0.50 | +0.12  | -0.25  | +0.19 | -0.03  |  |  |  |  |  |  |  |  |  |  |
| 13         | 17   | 0     | 11   | 14                   | 5    | 2     | 12   |        |        | 5      | 0      | 17     |        |        | 5      | 1      | 6      | -0.02  | -0.09  | +0.04  | -0.26  | +0.08  | -0.46  | +0.08  | -0.65  | +0.06   | -0.76 | +0.06  | -0.71 | +0.08 | -0.53 | +0.13  | -0.26  | +0.20 | -0.03  |  |  |  |  |  |  |  |  |  |  |
| 13         | 17   | 0     | 11   | 16                   | 15   | 0     | 1    |        |        | 5      | 0      | 17     |        |        | 6      | 0      | 25     | -0.05  | -0.04  | +0.02  | -0.16  | +0.04  | -0.35  | +0.06  | -0.58  | +0.04   | -0.79 | +0.04  | -0.84 | +0.04 | -0.73 | +0.11  | -0.43  | +0.19 | -0.12  |  |  |  |  |  |  |  |  |  |  |
| 16         | 4    | 0     | 25   | 16                   | 15   | 0     | 1    |        |        | 6      | 0      | 3      |        |        | 6      | 0      | 25     | -0.03  | -0.10  | +0.05  | -0.29  | +0.11  | -0.54  | +0.09  | -0.77  | +0.08   | -0.92 | +0.08  | -0.87 | +0.10 | -0.69 | +0.17  | -0.36  | +0.25 | -0.06  |  |  |  |  |  |  |  |  |  |  |
| 16         | 4    | 0     | 25   | 18                   | 15   | 1     | 5    |        |        | 6      | 0      | 3      |        |        | 6      | 3      | 25     | -0.04  | -0.07  | +0.03  | -0.25  | +0.07  | -0.52  | +0.09  | -0.79  | +0.07   | -1.02 | +0.08  | -1.03 | +0.09 | -0.87 | +0.16  | -0.50  | +0.27 | -0.13  |  |  |  |  |  |  |  |  |  |  |
| 17         | 17   | 2     | 15   | 18                   | 15   | 1     | 5    |        |        | 6      | 2      | 16     |        |        | 6      | 3      | 25     | -0.03  | -0.12  | +0.06  | -0.37  | +0.11  | -0.67  | +0.13  | -0.95  | +0.11   | -1.14 | +0.12  | -1.09 | +0.14 | -0.87 | +0.22  | -0.47  | +0.33 | -0.08  |  |  |  |  |  |  |  |  |  |  |
| 18         | 13   | 1     | 11   | 19                   | 11   | 0     | 2    |        |        | 6      | 3      | 21     |        |        | 7      | 1      | 2      | -0.02  | -0.14  | +0.07  | -0.42  | +0.11  | -0.76  | +0.14  | -1.05  | +0.12   | -1.25 | +0.13  | -1.19 | +0.16 | -0.94 | -0.24  | -0.50  | +0.35 | -0.09  |  |  |  |  |  |  |  |  |  |  |
| 20         | 4    | 1     | 4    | 21                   | 1    | 3     | 22   |        |        | 7      | 2      | 1      |        |        | 7      | 3      | 11     | -0.02  | -0.18  | +0.09  | -0.48  | +0.15  | -0.85  | +0.20  | -1.15  | +0.16   | -1.36 | +0.16  | -1.27 | +0.19 | -1.01 | +0.28  | -0.53  | +0.40 | -0.09  |  |  |  |  |  |  |  |  |  |  |
| 20         | 4    | 1     | 4    | 16                   | 17   | 3     | 16   |        |        | 7      | 2      | 1      |        |        | 6      | 1      | 3      | +0.07  | -0.40  | +0.23  | -0.87  | +0.31  | -1.35  | +0.34  | -1.63  | +0.29   | -1.68 | +0.33  | -1.35 | +0.37 | -0.83 | +0.49  | -0.20  | +0.65 | +0.26  |  |  |  |  |  |  |  |  |  |  |
| 20         | 4    | 1     | 4    | 15                   | 19   | 1     | 14   |        |        | 7      | 2      | 1      |        |        | 5      | 3      | 21     | Cracks appear on top of arch between the points H & I after a few minutes the arch collapses stretching itself out on the ground the eye of one of the tie rods is torn off at the right abutment. |        |        |        |        |        |        |        |         |       |        |       |       |       |        |        |       |        |  |  |  |  |  |  |  |  |  |  |

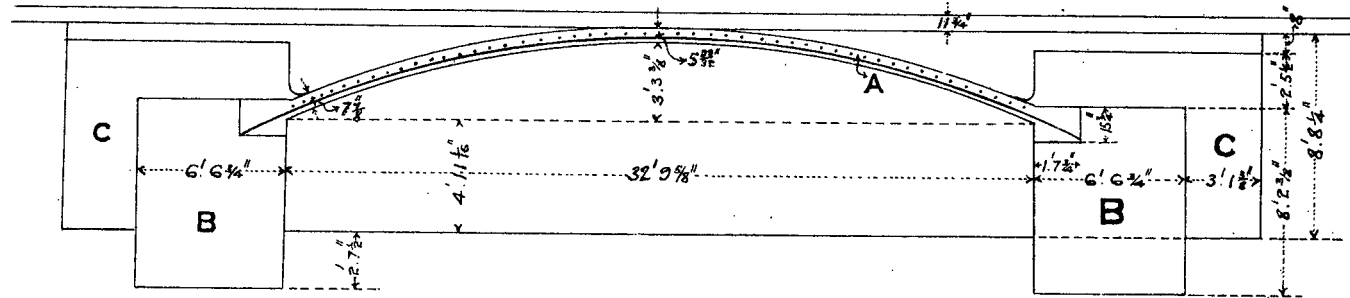
1. Cracks in the ground show that the right abutment is pushed out the tie rods are noticeably strained.

2. Cracks in the ground near the right abutment are getting larger.

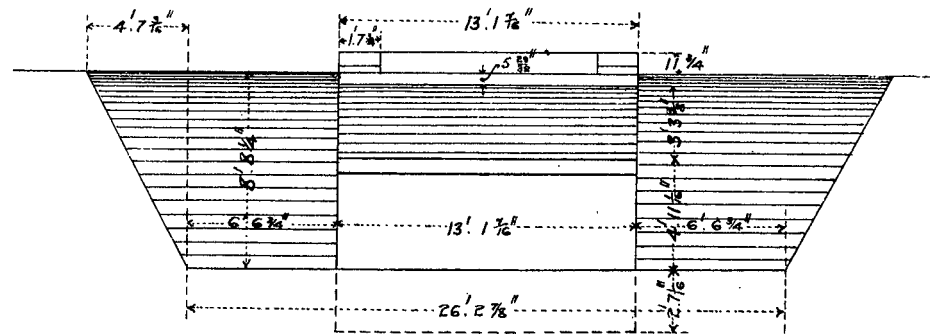
# Plate IV.

*Dimensions of the experimental Arch*

*at the Goods Station, Matzleindorf.*



*Longitudinal Section*



*Cross Section*

- A** *The New System Arch*
- B** *Brickwork*
- C** *Concrete*

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Plate V.

| NO OF TEST | DESCRIPTION OF LOAD                | DIAGRAMS OF POSITIONS OF APPLIED LOADS | NUMBER OF POINTS OF OBSERVATION |      |   |      |      |      |   |   |   | REMARKS |
|------------|------------------------------------|--|---------------------------------|------|---|------|------|------|---|---|---|---------|
|            |                                    |  | 1                               | 2    | 3 | 4    | 5    | 6    | 7 | 8 | 9 |         |
|            |                                    |  | DEFLECTION IN INCHES            |      |   |      |      |      |   |   |   |         |
| 1          | 2 <sup>ND</sup> CLASS TRUCK & LOAD |  | 0                               | 0    | 0 | 0    | 0    | 0    | 0 | 0 | 0 |         |
| 2          | 2 <sup>ND</sup> CLASS TRUCK & LOAD |  | 0                               | 0    | 0 | 0    | 0.02 | 0    | 0 | 0 | 0 |         |
| 3          | 2 <sup>ND</sup> CLASS TRUCK & LOAD |  | 0                               | 0.02 | 0 | 0    | 0.02 | 0.01 | 0 | 0 | 0 |         |
| 4          | 1 <sup>ST</sup> CLASS TRUCK & LOAD |  | 0                               | 0.01 | 0 | 0.01 | 0.02 | 0.01 | 0 | 0 | 0 |         |

Plate VI.

| N <sup>o</sup><br>OF TEST | DESCRIPTION<br>OF LOAD                                 | DIAGRAMS OF POSITIONS OF APPLIED LOADS | NUMBER OF POINTS OF OBSERVATION |      |      |      |      |      |      |      |      | REMARKS       |
|---------------------------|--|--|---------------------------------|------|------|------|------|------|------|------|------|---------------|
|                           |  |  | 1                               | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |               |
|                           |  |  | DEFLECTION IN INCHES            |      |      |      |      |      |      |      |      |               |
| 5                         | 1 <sup>ST</sup> CLASS TRUCK & LOAD                     |  | 0.01                            | 0.04 | 0.02 | 0.01 | 0.04 | 0.02 | 0    | 0.02 | 0    |               |
| 6                         | 1 <sup>ST</sup> CLASS TRUCK & LOAD                     |  | 0.02                            | 0.01 | 0.02 | 0.01 | 0.04 | 0.02 | 0    | 0    | 0    |               |
| 7                         | 1 <sup>ST</sup> CLASS TRUCK & EQUALLY DISTRIBUTED LOAD |  | 0.01                            | 0.04 | 0.04 | 0    | 0.04 | 0.02 | 0    | 0.02 | 0.04 |               |
| 8                         | 1 <sup>ST</sup> CLASS TRUCK & EQUALLY DISTRIBUTED LOAD |  | 0.03                            | 0.06 | 0.04 | 0.04 | 0.06 | 0.03 | 0.01 | 0.03 | 0.03 | PERMANENT SET |
|                           |  |  | 0                               | 0.02 | 0.04 | 0    | 0.02 | 0.03 | 0    | 0    | 0    |               |



Plate VII.

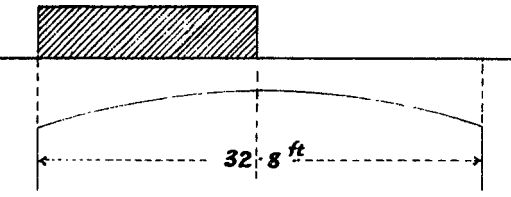
| N <sup>o</sup><br>OF TEST | DESCRIPTION<br>OF LOAD | DIAGRAMS OF POSITIONS OF APPLIED LOADS | NUMBER OF POINTS OF OBSERVATION |      |      |      |      |      |      |      |      | REMARKS  |
|---------------------------|------------------------|--|---------------------------------|------|------|------|------|------|------|------|------|--|
|                           |                        |  | 1                               | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |  |
|                           |                        |  | DEFLECTION IN INCHES            |      |      |      |      |      |      |      |      |  |
| 9                         | TENDER                 |  | 0.02                            | 0.02 | 0.04 | 0    | 0.04 | 0.01 | 0    | 0.03 | 0.03 | FROM MARK<br>OF PERMANENT<br>SET OF LAST<br>TEST                   |
| 10                        | TENDER                 |  | 0.04                            | 0.06 | 0.07 | 0.03 | 0.06 | 0.02 | 0.02 | 0.06 | 0.05 |  |
| 11                        | LOCOMOTIVE<br>& TENDER |  | 0.04                            | 0.04 | 0.08 | 0.05 | 0.08 | 0.01 | 0.06 | 0.08 | 0.07 | PERMANENT<br>SET<br><br>FROM MARK OF PERMANENT SET<br>OF LAST TEST |
|                           |                        |  | 0                               | 0    | 0    | 0    | 0    | 0.01 | 0.01 | 0.01 | 0.04 |  |

(140-)

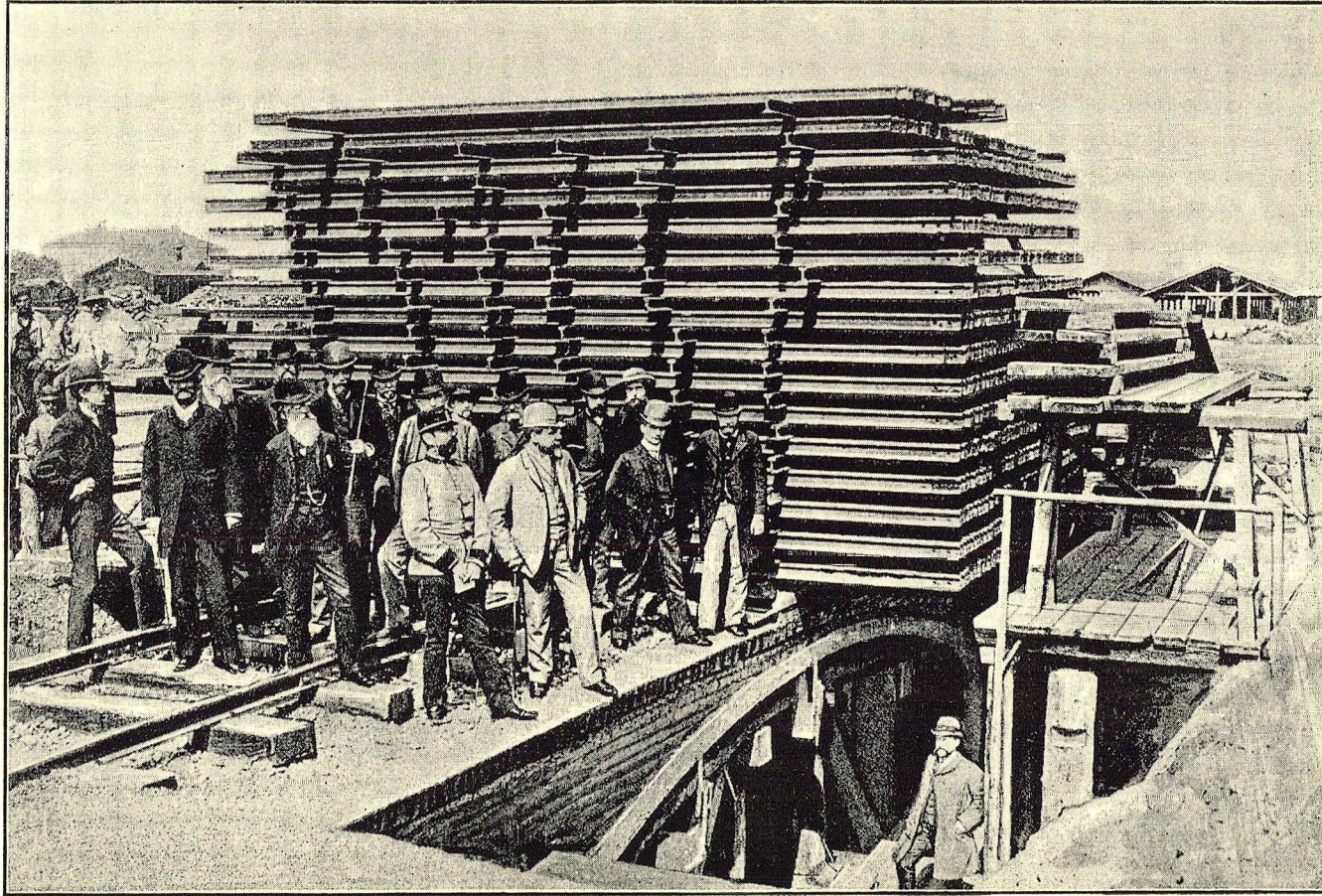
# RESULTS OF TESTS 16<sup>TH</sup> MAY 1890

| NO. OF TEST                                       | DIAGRAMS OF POSITIONS OF APPLIED LOADS | DESCRIPTION AND AMOUNT OF LOAD | NUMBER OF POINTS OF OBSERVATION |        |       |       |        |       |        |                         |       |       |              |        |       | REMARKS |        |        |       |       |  |
|---|--|--------------------------------|---------------------------------|--------|-------|-------|--------|-------|--------|-------------------------|-------|-------|--------------|--------|-------|---------|--------|--------|-------|-------|--|
|   |  |                                | BETWEEN THE ABUTMENTS           |        |       |       |        |       |        |                         |       |       | AT ABUTMENTS |        |       |         |        |        |       |       |  |
|   |  |                                | 1                               | 2      | 3     | 4     | 5      | 6     | 7      | 8                       | 9     | 10    | 11           | 12     | 13    |         |        |        |       |       |  |
|   |  |                                | RECORDED DEPRESSION -           |        |       |       |        |       |        |                         |       |       | ELEVATION +  |        |       |         |        |        |       |       |  |
| <i>Horizontal movement towards Matzleindorf</i> + |  |                                |                                 |        |       |       |        |       |        | <i>towards Vienna</i> - |       |       |              |        |       |         |        |        |       |       |  |
| 1   |  | LOCOMOTIVE                     | LOADED                          | +0.01  | -0.06 | -0.06 | +0.02  | -0.04 | -0.16  | +0.01                   | -0.04 | -0.07 | 0.00         | -0.02  | 0.00  | 0.00    |        |        |       |       |  |
|   |  |                                | LOAD REMOVED                    | -0.02  | -0.02 | -0.04 | 0.00   | -0.03 | 0.00   | 0.00                    | -0.01 | 0.00  | -0.01        | 0.00   | +0.01 | 0.00    | -0.03  |        |       |       |  |
|   |  |                                |                                 | 0.00   | -0.02 | 0.00  | 0.00   | 0.00  | -0.01  | 0.00                    | -0.02 | 0.00  | 0.00         | -0.004 | 0.00  | 0.00    |        |        |       |       |  |
|   |  |                                |                                 | 0.00   | 0.00  | 0.00  | 0.00   | 0.00  | 0.00   | 0.00                    | 0.00  | 0.00  | 0.00         | 0.00   | 0.00  | 0.00    |        |        |       |       |  |
| 2   |  | LOCOMOTIVE                     | LOADED                          | +0.01  | -0.07 | -0.09 | +0.02  | -0.06 | -0.20  | +0.01                   | -0.05 | +0.11 | 0.00         | -0.02  | 0.00  | -0.01   |        |        |       |       |  |
|   |  |                                | LOAD REMOVED                    | -0.02  | -0.02 | -0.01 | 0.00   | -0.04 | -0.004 | -0.01                   | -0.01 | -0.01 | -0.01        | -0.01  | -0.01 | 0.00    |        |        |       |       |  |
|   |  |                                |                                 | 0.00   | -0.02 | -0.01 | -0.01  | 0.00  | -0.10  | 0.00                    | -0.01 | -0.02 | 0.00         | -0.004 | 0.00  | 0.00    |        |        |       |       |  |
|   |  |                                |                                 | -0.004 | 0.00  | 0.00  | 0.00   | 0.00  | -0.004 | -0.01                   | -0.01 | -0.01 | -0.01        | 0.00   | 0.00  | 0.00    |        |        |       |       |  |
| 3   |  | RAILS                          | Tons Cwts qrs. lbs              | 51     | 15    | 0     | 20     | -0.13 | -0.17  | -0.01                   | -0.14 | -0.18 | -0.10        | -0.14  | -0.17 | -0.02   | -0.02  | -0.004 | -0.02 | 0.00  | <p>The Rails were placed upon the Vienna half of Bridge in lots of 50, laid upon 6 Rails, the latter lying in the same direction as the Railway Line, so that each layer consisted of 56 rails</p> <p>Recorded at 11.15 am</p> <p>Recorded at 2.45 pm</p> <p>Recorded at 4.30 p.m.</p> |
|   |  |                                | 64                              | 12     | 2     | 0     | -0.004 | -0.03 | +0.03  | +0.03                   | +0.04 | +0.04 | -0.01        | +0.01  | +0.02 | +0.02   | -0.02  | -0.02  | +0.01 | +0.04 |  |
|   |  |                                | 78                              | 11     | 1     | 20    | -0.18  | -0.22 | -0.01  | -0.20                   | -0.24 | -0.10 | -0.18        | -0.24  | -0.24 | -0.02   | -0.004 | -0.03  | 0.00  |       |  |
|   |  |                                | 88                              | 7      | 3     | 12    | -0.02  | +0.04 | +0.02  | -0.04                   | +0.05 | +0.05 | -0.17        | +0.03  | +0.02 | +0.02   | +0.04  | +0.02  | -0.03 | -0.03 |  |
|   |  |                                | 98                              | 4      | 1     | 4     | -0.24  | -0.33 | -0.02  | -0.32                   | -0.36 | -0.09 | -0.31        | -0.35  | -0.02 | -0.03   | -0.004 | -0.04  | 0.00  |       |  |
|   |  |                                | 98                              | 4      | 1     | 4     | -0.02  | +0.07 | +0.08  | -0.05                   | +0.08 | -0.09 | -0.02        | +0.05  | +0.05 | -0.01   | +0.05  | +0.01  | +0.05 | +0.01 |  |
|   |  |                                | 98                              | 4      | 1     | 4     | -0.37  | -0.40 | -0.02  | -0.42                   | -0.44 | -0.09 | -0.40        | -0.43  | -0.02 | -0.03   | -0.004 | -0.06  | -0.01 |       |  |
|   |  |                                | 49                              | 2      | 0     | 16    | 0.00   | +0.09 | +0.10  | -0.05                   | +0.10 | +0.11 | -0.01        | +0.06  | +0.07 | -0.01   | +0.07  | 0.00   | -0.07 |       |  |
|   |  |                                | BY UNLOADING                    | -0.45  | -0.50 | -0.03 | -0.50  | -0.54 | -0.09  | -0.47                   | -0.51 | -0.02 | -0.03        | -0.004 | -0.06 | +0.01   |        |        |       |       |  |
|   |  |                                |                                 | 0.00   | +0.10 | +0.12 | -0.05  | +0.12 | +0.13  | -0.01                   | +0.09 | +0.09 | -0.01        | +0.07  | -0.01 | +0.08   |        |        |       |       |  |
|   |  |                                |                                 | -0.49  | -0.55 | -0.04 | -0.56  | -0.61 | -0.12  | -0.54                   | -0.54 | -0.02 | -0.04        | 0.00   | -0.06 | 0.00    |        |        |       |       |  |
|   |  |                                |                                 | 0.00   | +0.10 | +0.12 | -0.07  | +0.15 | +0.16  | -0.02                   | +0.09 | +0.10 | -0.02        | +0.07  | -0.01 | +0.09   |        |        |       |       |  |
|   |  |                                |                                 | -0.37  | -0.37 | -0.01 | -0.45  | -0.42 | -0.06  | -0.42                   | -0.41 | 0.00  | -0.03        | 0.00   | -0.05 | 0.00    |        |        |       |       |  |
|   |  |                                |                                 | +0.01  | +0.09 | +0.06 | -0.05  | +0.13 | +0.11  | -0.02                   | +0.09 | +0.11 | -0.02        | +0.06  | -0.02 | +0.05   |        |        |       |       |  |

# RESULTS OF TESTS 17<sup>TH</sup> MAY 1890

| No<br>OF<br>TEST    | DIAGRAM OF POSITION<br>OF APPLIED LOAD  | DESCRIPTION<br>AND AMOUNT<br>OF LOAD | NUMBER OF POINTS OF OBSERVATION                   |       |       |       |       |       |       |       |       |                         |       |       |       | REMARKS |   |
|---------------------|---|--------------------------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------|-------|-------|-------|---------|---|
|                     |   |                                      | BETWEEN THE ABUTMENTS                             |       |       |       |       |       |       |       |       | AT ABUTMENTS            |       |       |       |         |   |
|                     |   |                                      | 1   | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10                      | 11    | 12    | 13    |         |   |
|                     |   |                                      | RECORDED DEPRESSION -                             |       |       |       |       |       |       |       |       | ELEVATION +             |       |       |       |         |   |
| VIENNA MATZLEINDORF |   |                                      | <i>Horizontal movement towards Matzleindorf +</i> |       |       |       |       |       |       |       |       | <i>towards Vienna -</i> |       |       |       |         |   |
| 4                   |  | RAILS                                | Unloaded  | -0.16 | -0.14 | -0.03 | -0.16 | -0.15 | -0.03 | -0.17 | -0.16 | -0.02                   | -0.05 | -0.02 | -0.03 | 0.00    | <p><i>The values here recorded are taken from the same zero points as used on the 16<sup>th</sup> May</i></p> <p><i>The rails were as on 16<sup>th</sup> May placed in lots of 56 in each layer</i></p> |
|                     |   |                                      | +0.01   | +0.02 | +0.02 | -0.04 | +0.04 | +0.02 | -0.01 | +0.02 | +0.08 | -0.02                   | +0.06 | -0.01 | +0.03 |         |   |
|                     |   |                                      | 88.39 Tons  | -0.41 | -0.47 | -0.06 | -0.46 | -0.50 | -0.06 | -0.50 | -0.51 | -0.03                   | -0.07 | -0.01 | -0.06 | 0.00    |   |
|                     |   |                                      | +0.004  | +0.08 | +0.11 | -0.06 | +0.12 | +0.13 | -0.03 | +0.07 | +0.12 | -0.03                   | +0.11 | -0.01 | +0.07 |         |   |
|                     |   |                                      | 98.21 Tons  | -0.44 | -0.52 | -0.07 | -0.50 | -0.55 | -0.08 | -0.52 | -0.56 | -0.04                   | -0.09 | -0.01 | -0.07 | 0.00    |   |
|                     |   |                                      | +0.004  | +0.09 | +0.12 | -0.07 | +0.13 | +0.13 | -0.03 | +0.10 | +0.12 | -0.05                   | +0.11 | -0.02 | +0.08 |         |   |
| 108.03 Tons         | -0.48   | -0.57                                | -0.08   | -0.54 | -0.59 | -0.08 | -0.56 | -0.62 | -0.04 | -0.09 | -0.01 | -0.08                   | 0.0   |       |       |         |   |
| -0.004              | +0.09   | +0.13                                | -0.07   | +0.14 | +0.14 | -0.03 | +0.10 | +0.13 | -0.05 | +0.11 | -0.03 | +0.09                   |       |       |       |         |   |
| 127.70 Tons         | -0.58   | -0.70                                | -0.11   | -0.65 | -0.74 | -0.10 | -0.68 | -0.76 | -0.07 | -0.09 | -0.01 | -0.09                   | +0.01 |       |       |         |   |
| 0.00                | +0.10   | +0.15                                | -0.08   | +0.16 | +0.17 | -0.03 | +0.11 | +0.16 | -0.05 | +0.13 | -0.03 | +0.10                   |       |       |       |         |   |
| 147.32 Tons         | -0.72   | -0.94                                | -0.16   | -0.84 | -1.00 | -0.15 | -0.86 | -1.02 | -0.11 | -0.13 | -0.01 | -0.13                   | +0.01 |       |       |         |   |
| -0.02               | +0.10   | +0.20                                | -0.09   | +0.18 | +0.23 | -0.05 | +0.13 | +0.20 | -0.05 | +0.15 | -0.07 | +0.13                   |       |       |       |         |   |
| 167.00 Tons         | -0.94   | -1.24                                | -0.24   | -1.03 | -1.28 | -0.24 | -1.09 | -1.33 | -0.20 | -0.13 | -0.01 | -0.16                   | +0.01 |       |       |         |   |
| -0.05               | +0.10   | +0.25                                | -0.14   | +0.20 | +0.29 | -0.10 | +0.13 | +0.25 | -0.16 | +0.15 | -0.07 | +0.16                   |       |       |       |         |   |



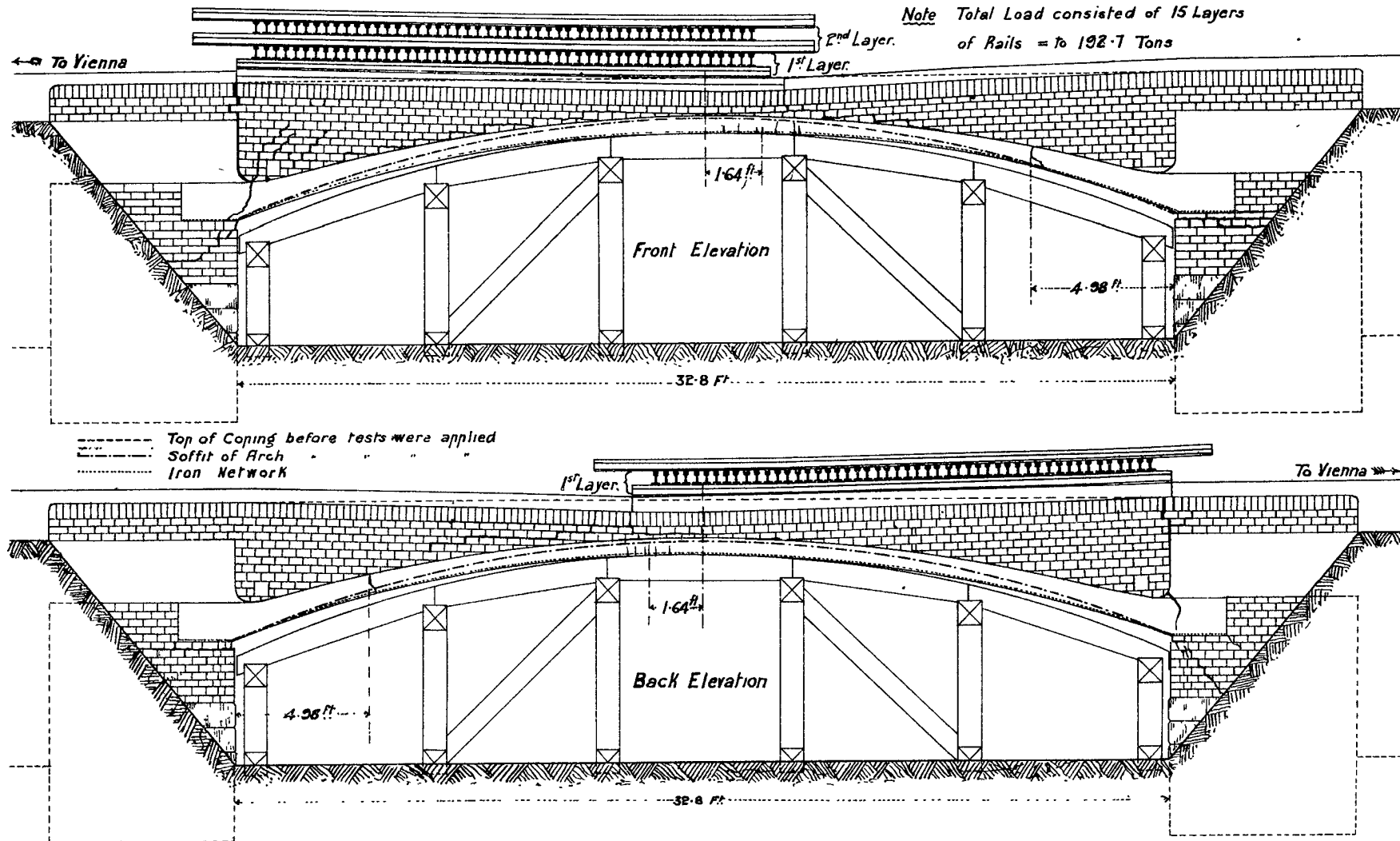


TEST OF THE EXPERIMENTAL ARCH AT MATZLEINDORF.



# Plate XI.

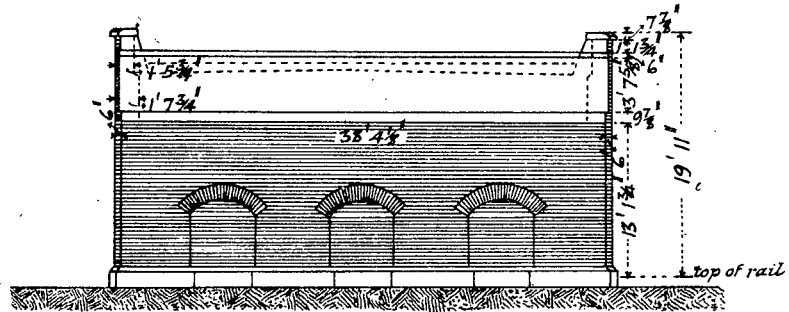
Front & Back elevation of the experimental Arch  
 at the Goods Station, Matzleindorf, after collapse,  
 under a load of 192.7 tons, or 17 cwt, 3 qrs. 18 lbs per square foot,  
 taken on the 18<sup>th</sup> May, 1890, the day after the experiment.



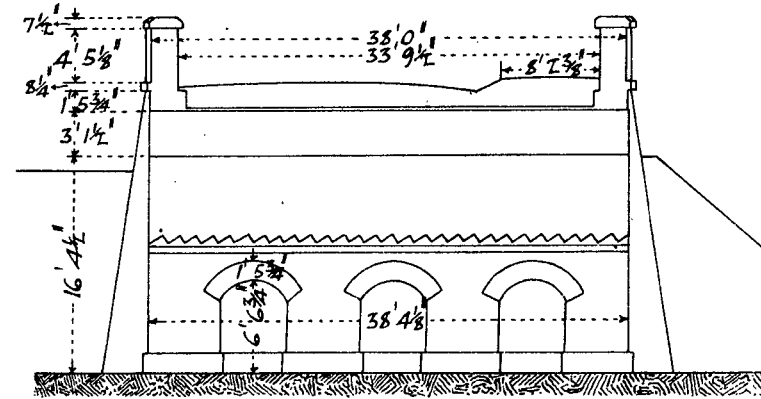
(140.)

# Plate XII.

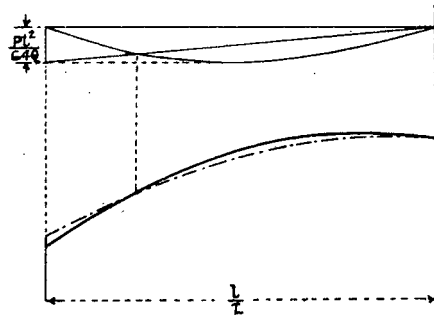
*Cross Sections through Crown of Arches showing the difference between the thickness of Arch in the old and new bridges, at Matzleindorf.*



*New Bridge*



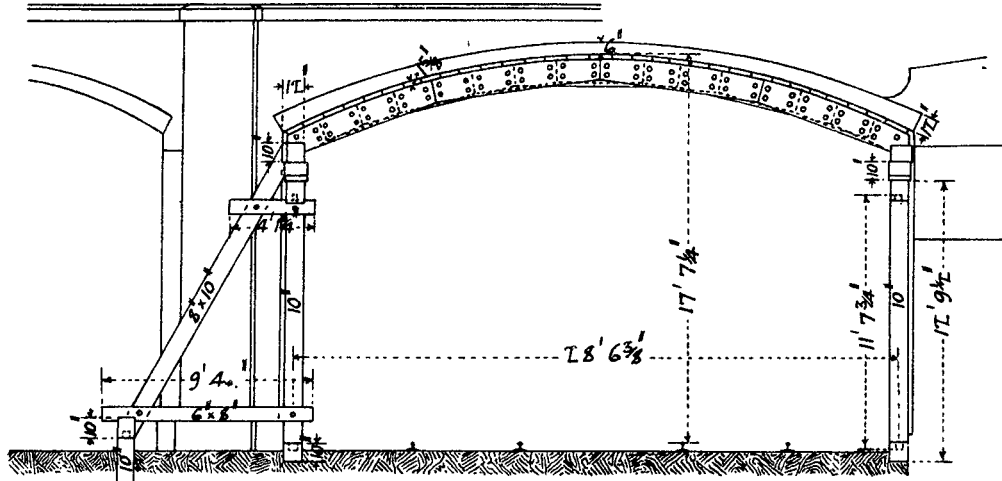
*Old Bridge*



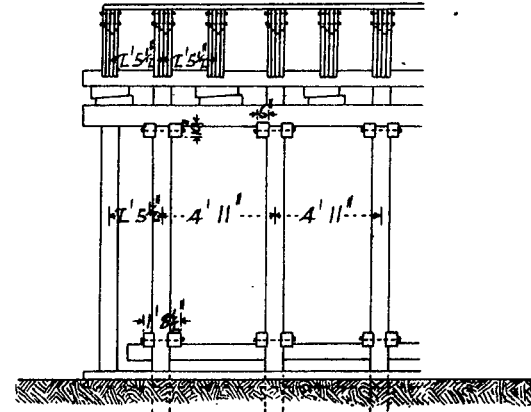
*Diagram of Stresses*

Plate XIII.

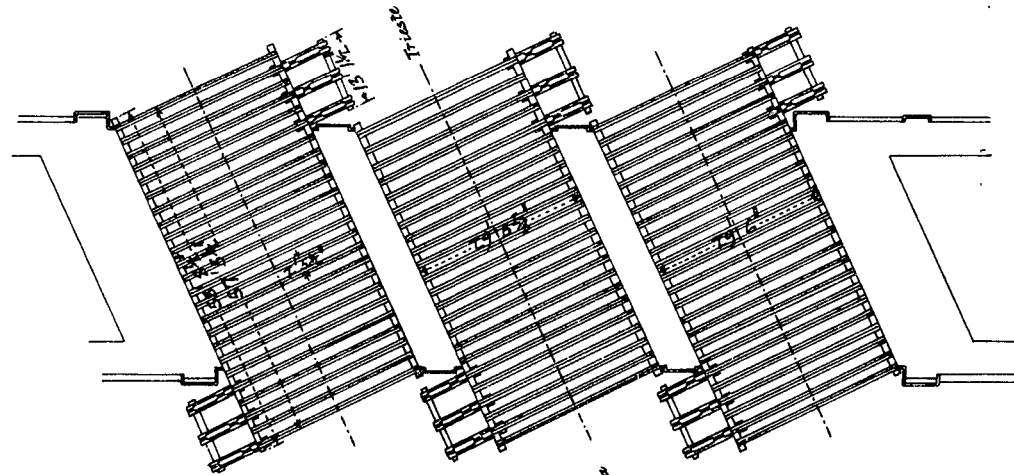
Construction of Centering for New Overhead Bridge, at Matzleindorf.



Elevation



Section



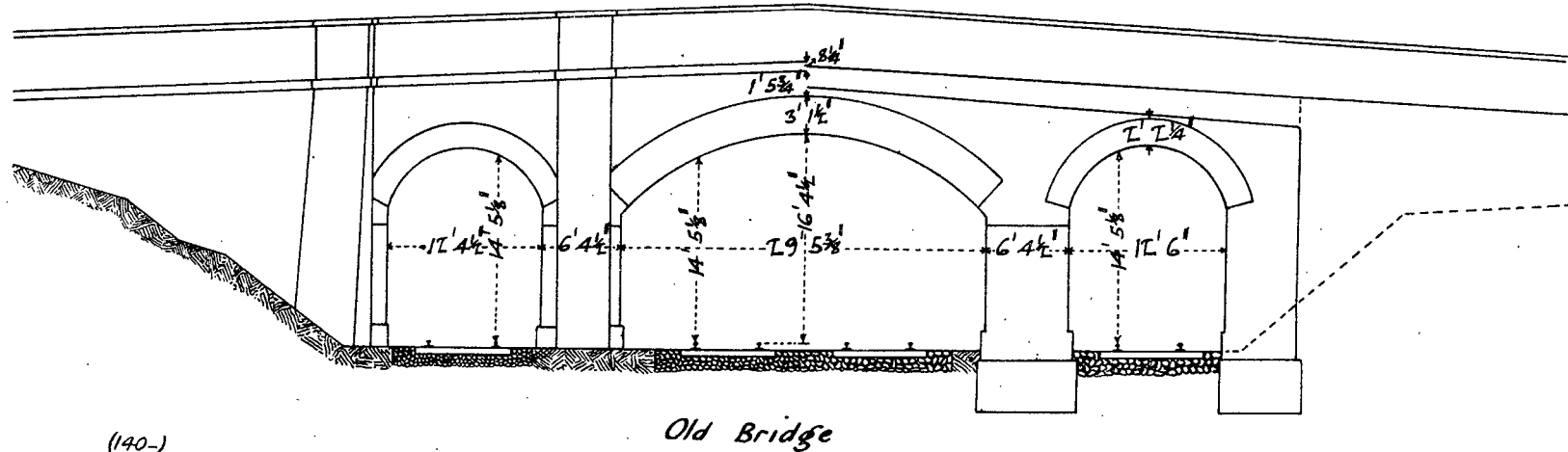
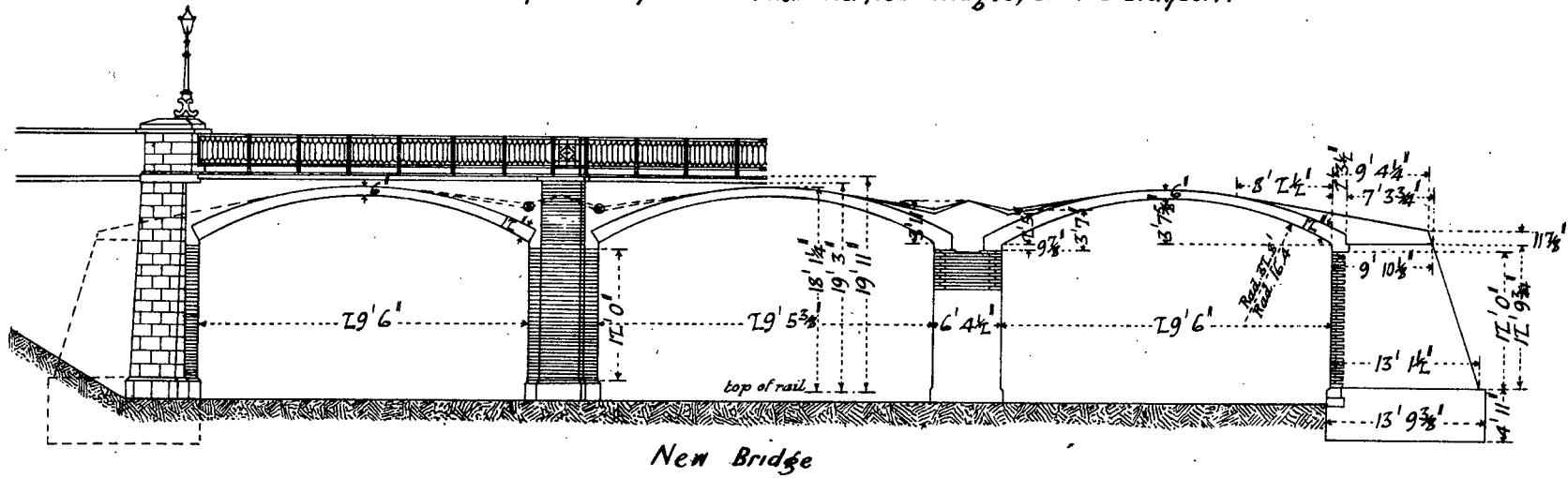
Plan

(140-)



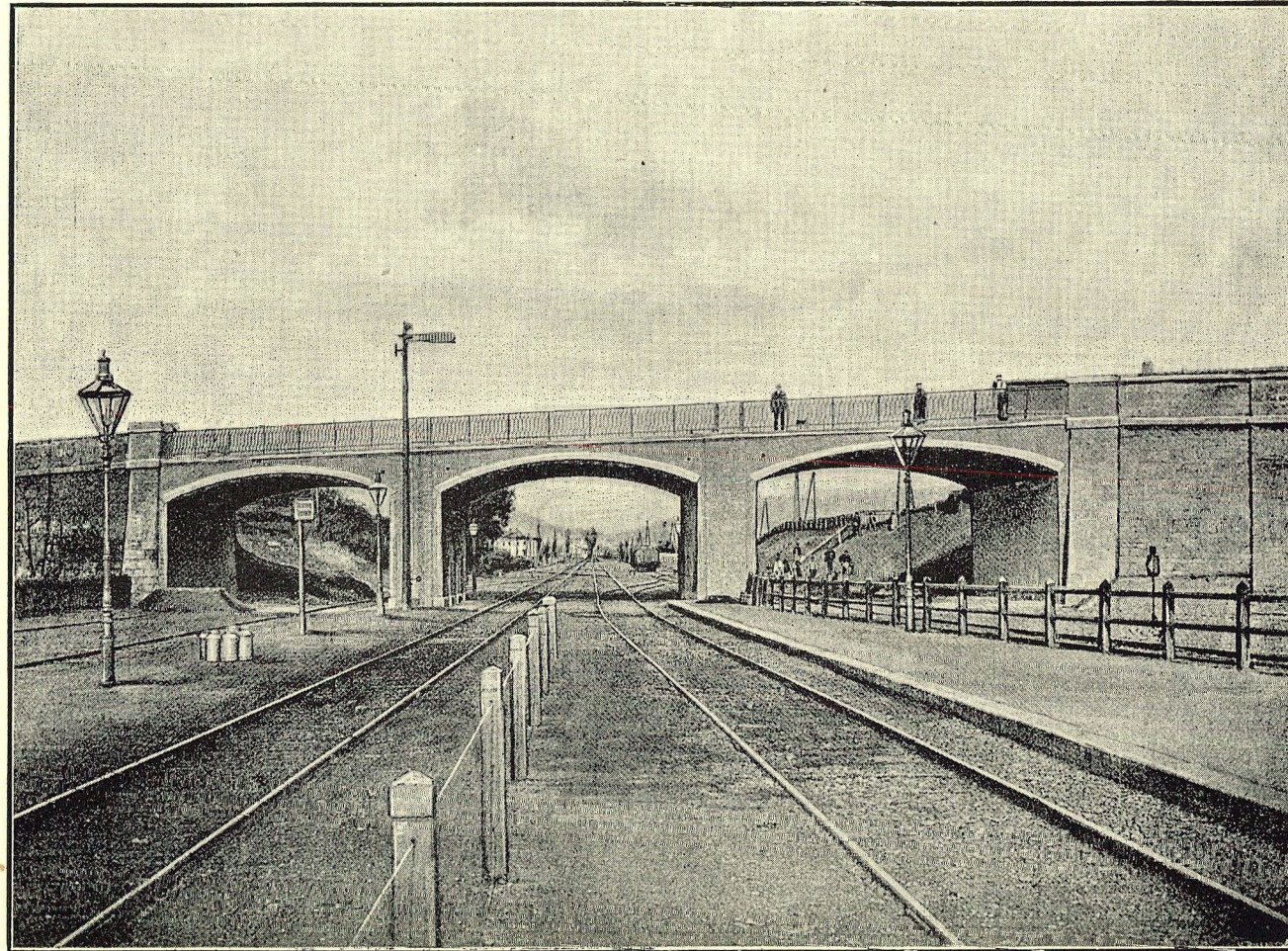
# Plate XIV.

*Half Elevation & Section of Old & New Overhead Bridges, at Matzleindorf.*



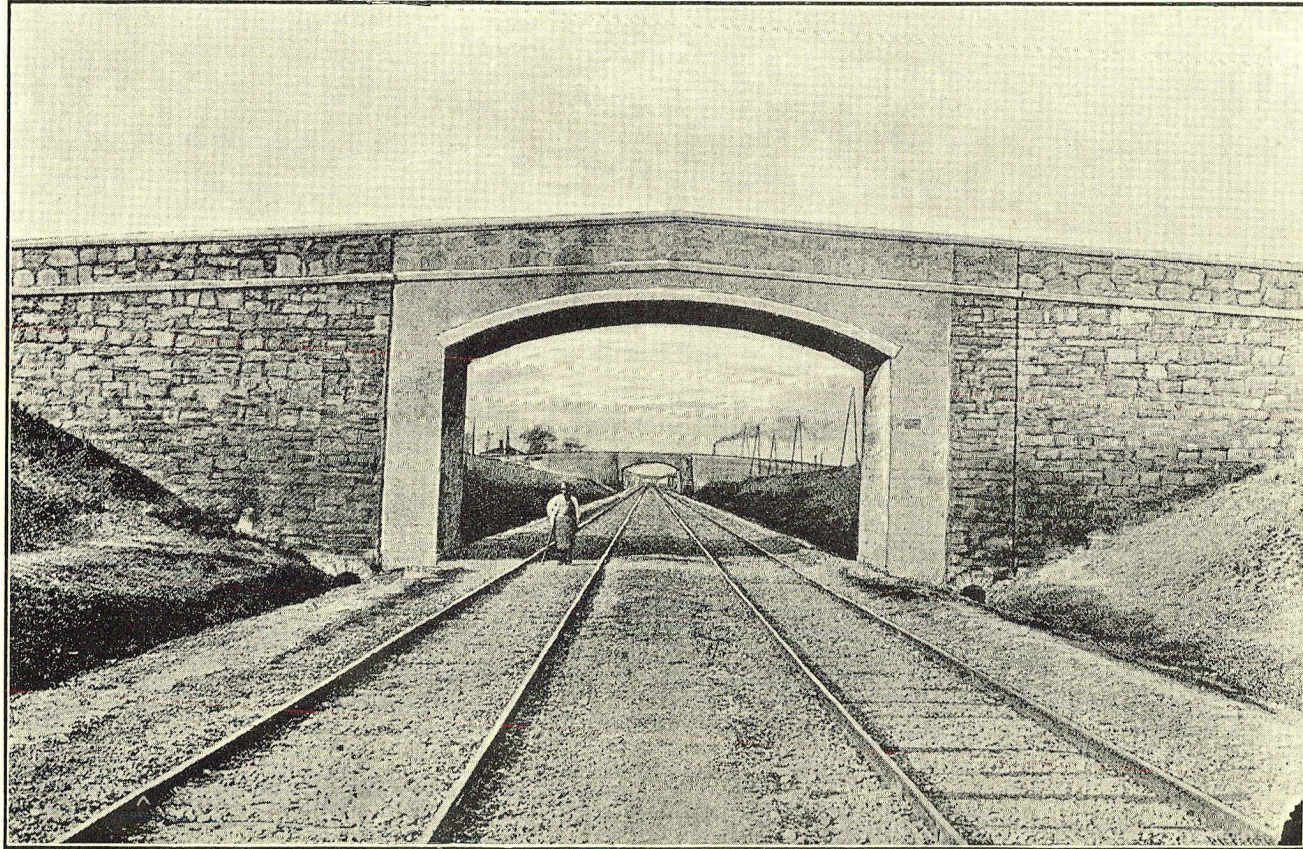
(140-)





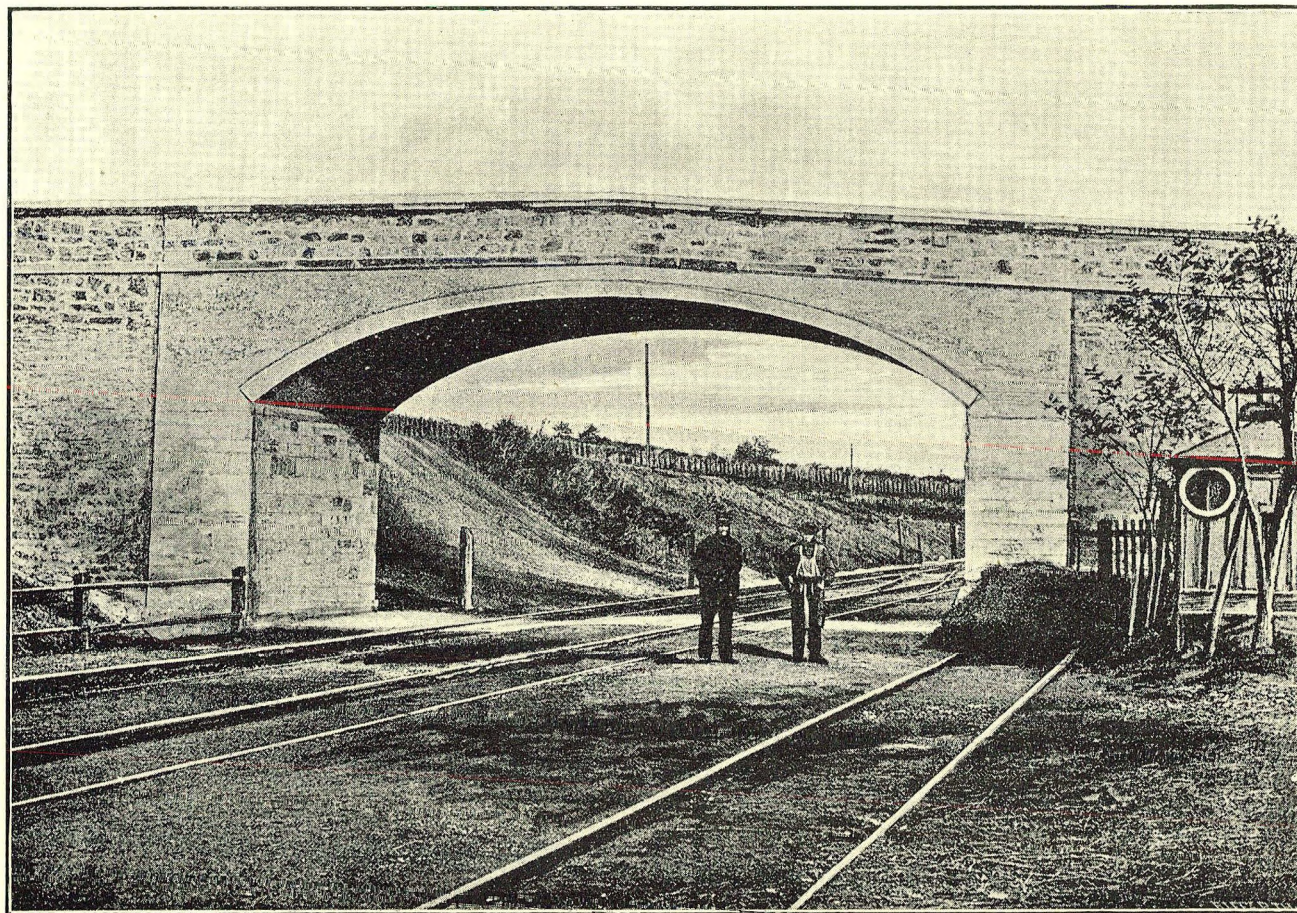
NEW OVERHEAD BRIDGE AT MATZLEINDORF.





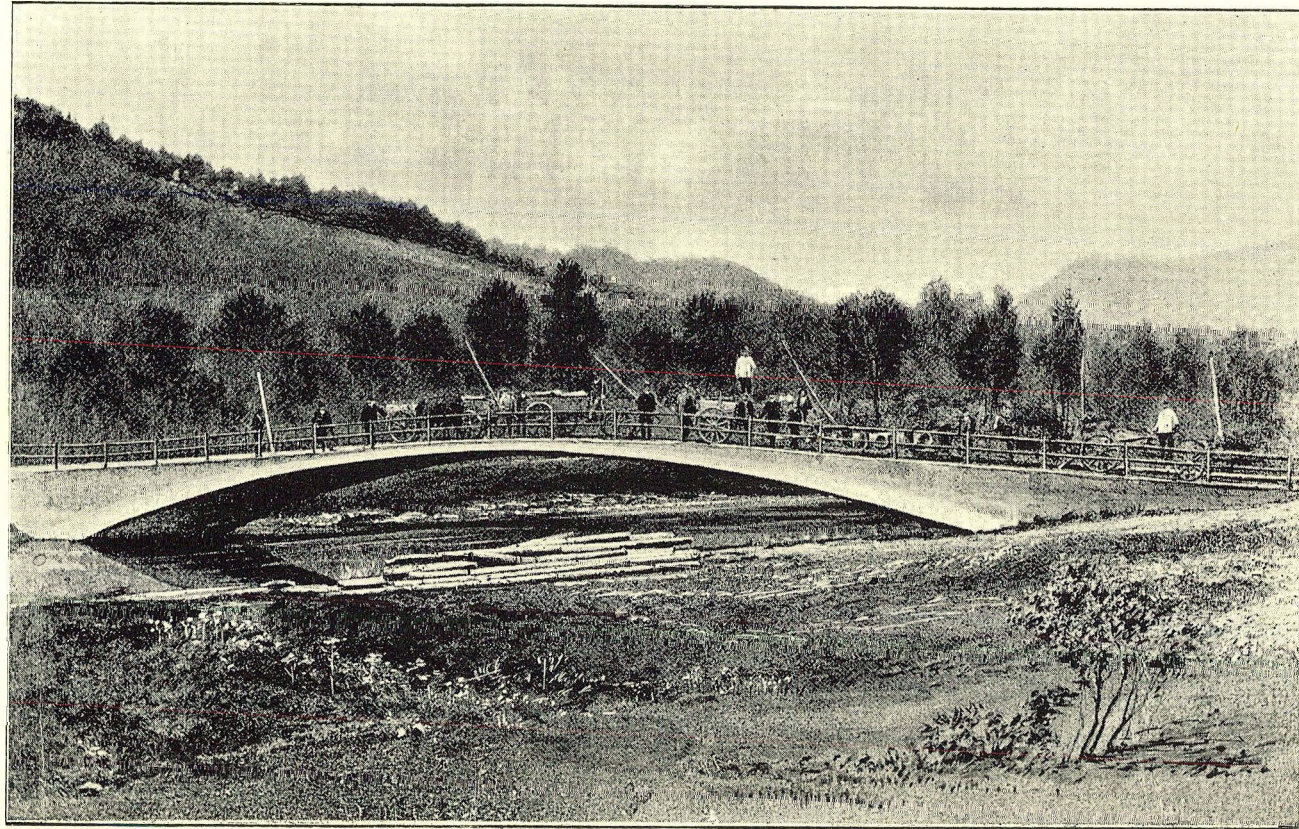
TWO NEW OVERHEAD BRIDGES ON THE LIESING-FELIXDORF LINE OF THE AUSTRIAN SOUTH RAILWAY COMPANY.





NEW OVERHEAD BRIDGE ON THE LIESING-FELIXDORF LINE OF THE AUSTRIAN SOUTH RAILWAY COMPANY.



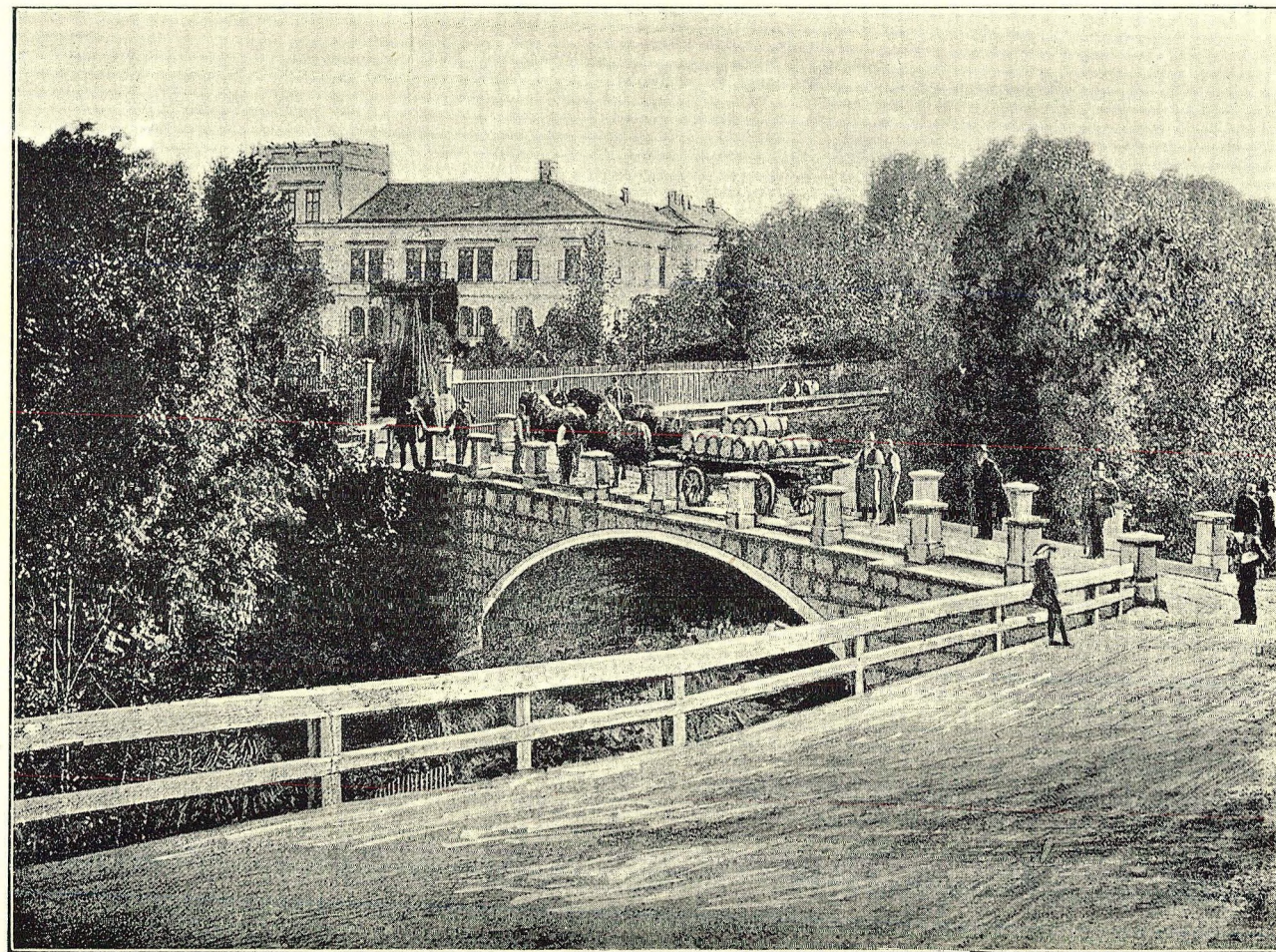


ROAD BRIDGE AT ARAN (SWITZERLAND).



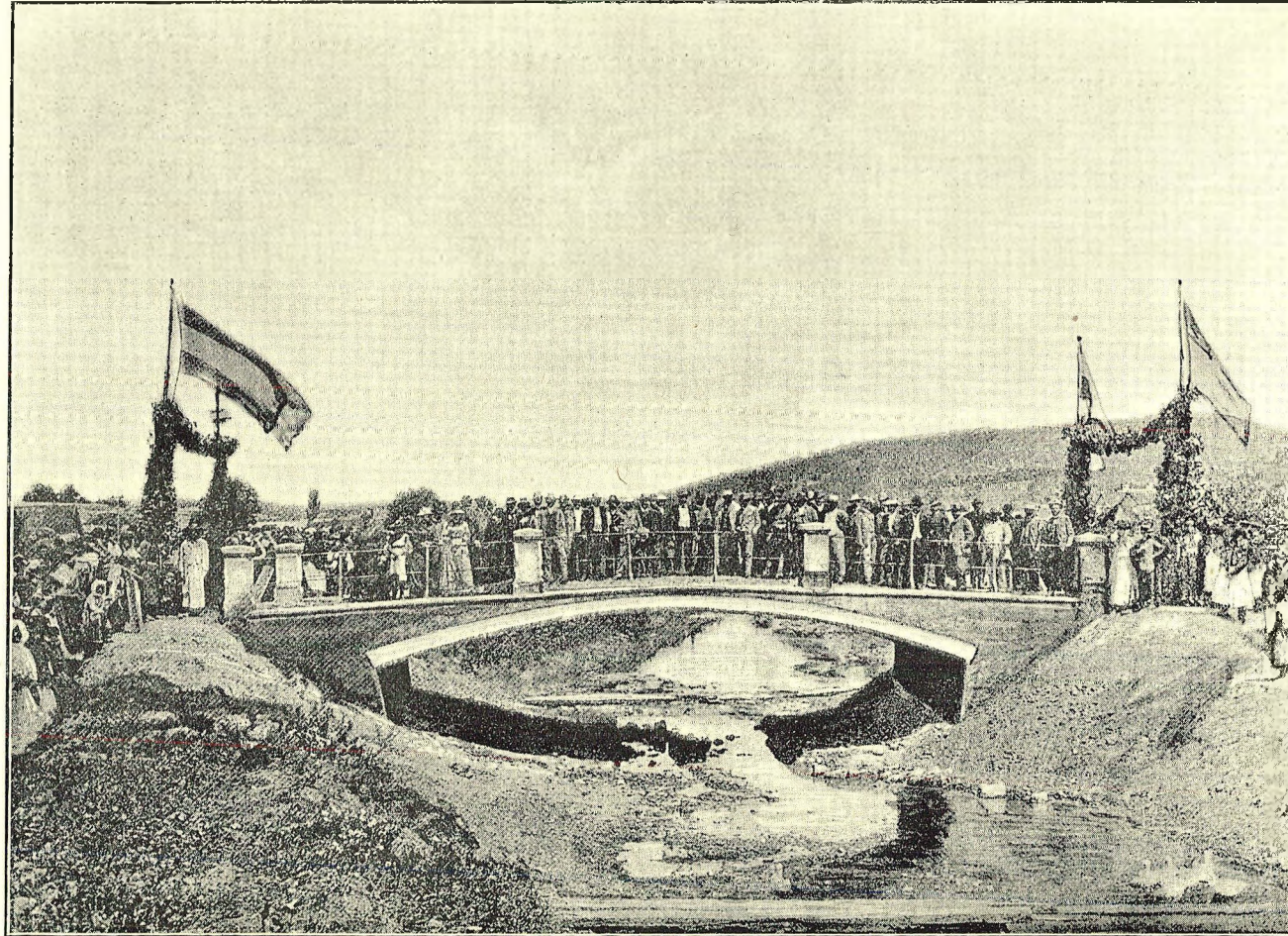
ROAD BRIDGE AT ARAI (SWITZERLAND)





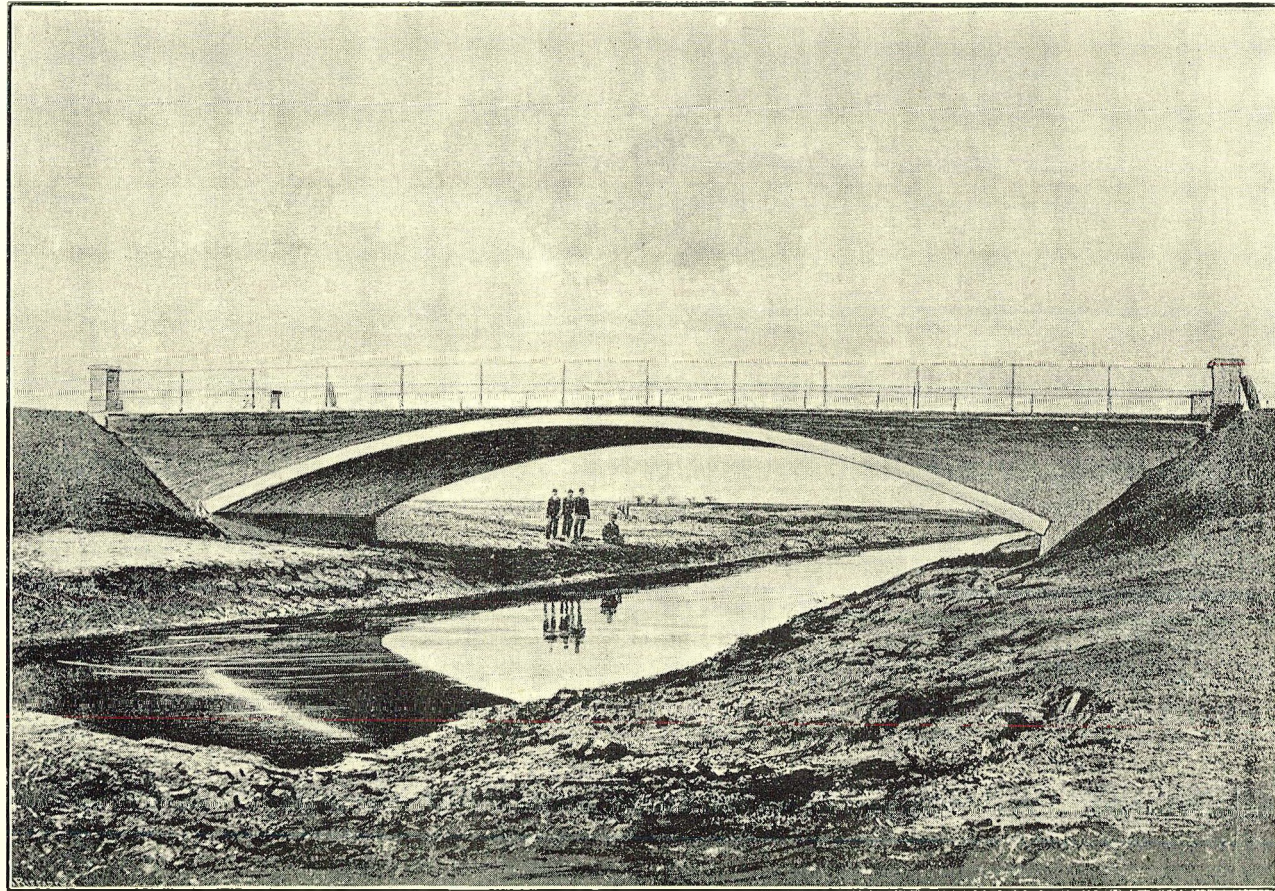
ROAD BRIDGE AT STEYR (UPPER AUSTRIA).





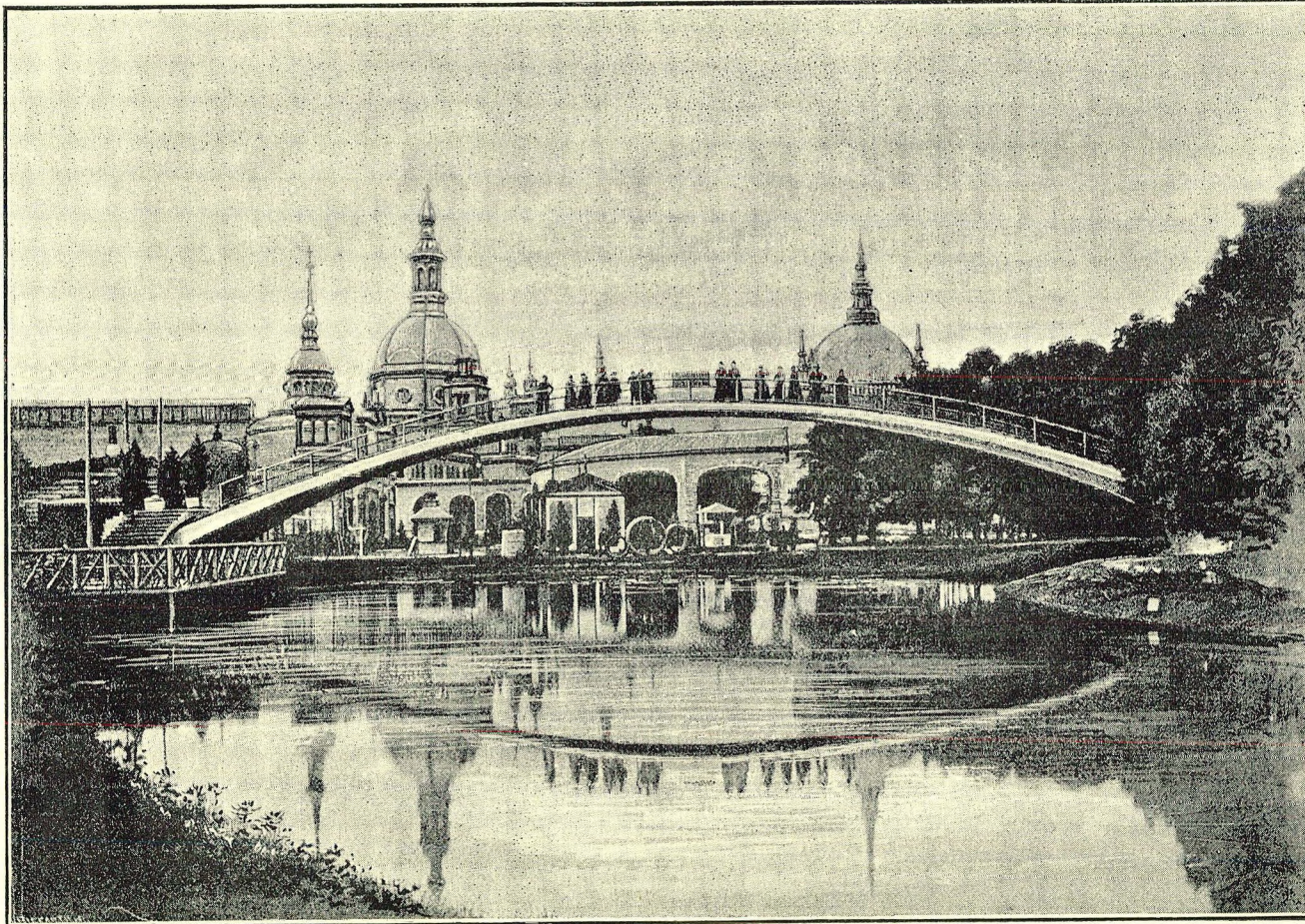
ROAD BRIDGE NEAR ASZOD (HUNGARY).





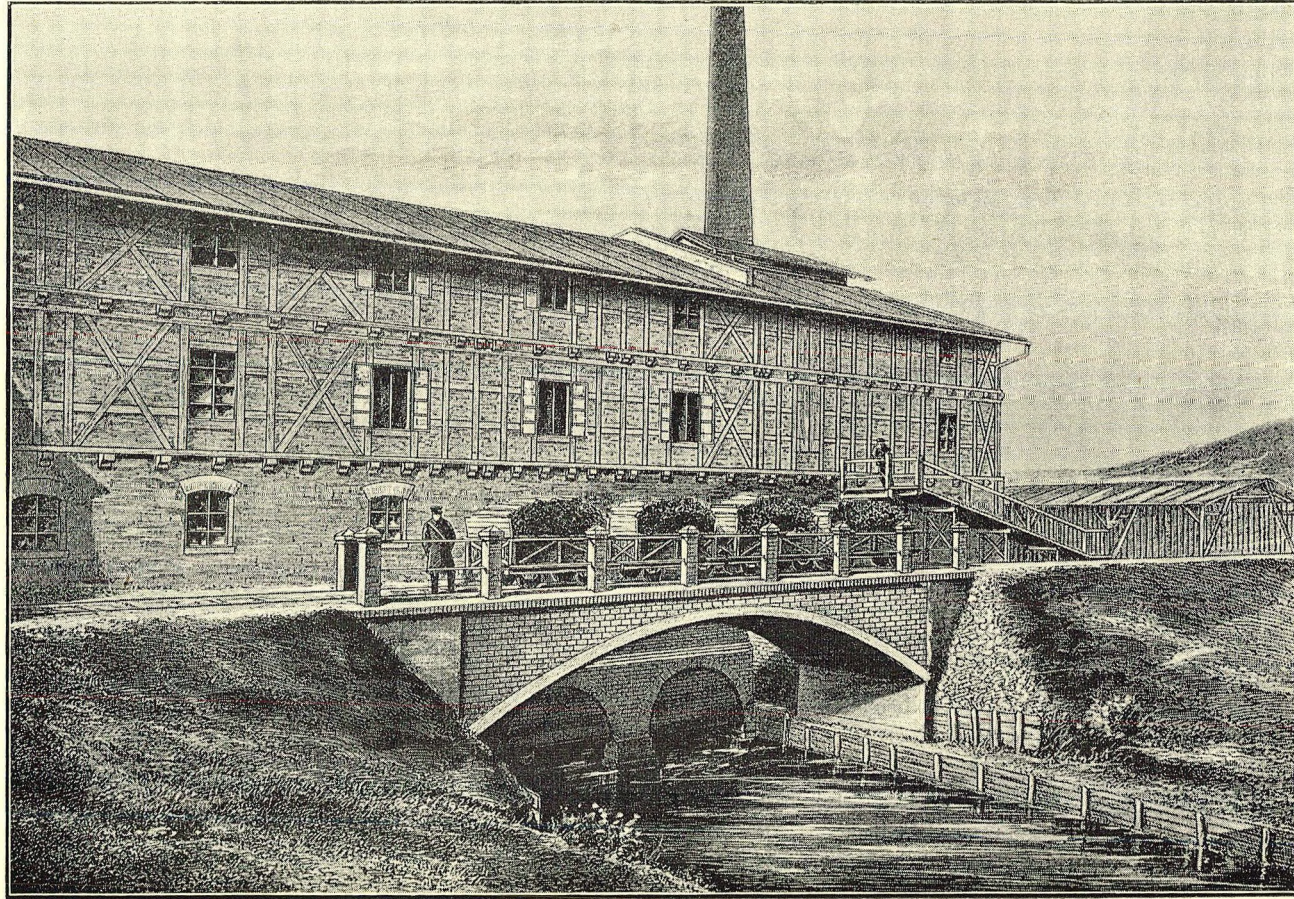
ROAD BRIDGE NEAR SARBOGARD (HUNGARY).





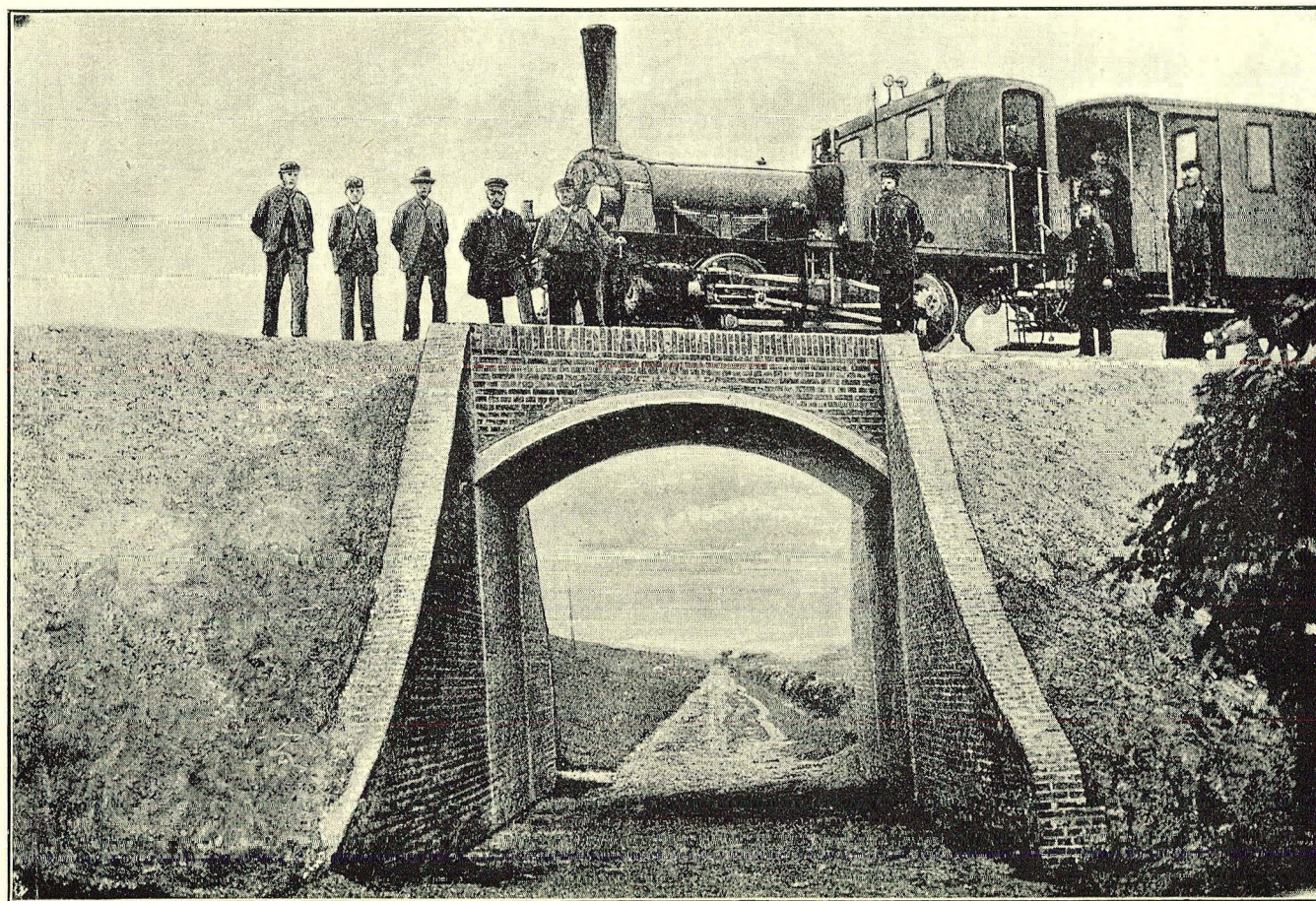
BRIDGE AT THE EXHIBITION AT BREMEN.





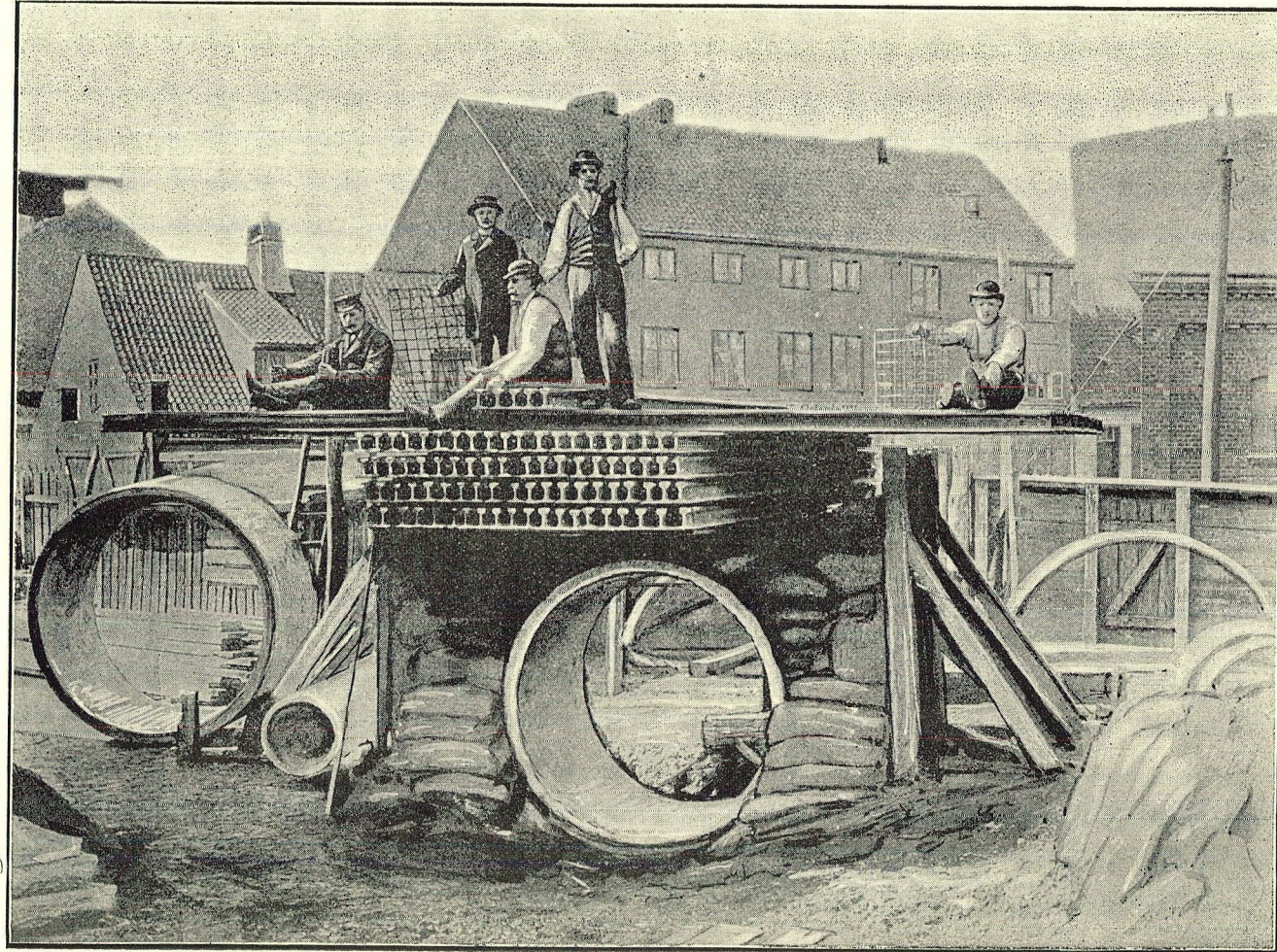
RAILWAY BRIDGE AT NEUSTADT (WESTERN PRUSSIA).





RAILWAY BRIDGE IN THE DUKEDOM OF OLDENBURG.

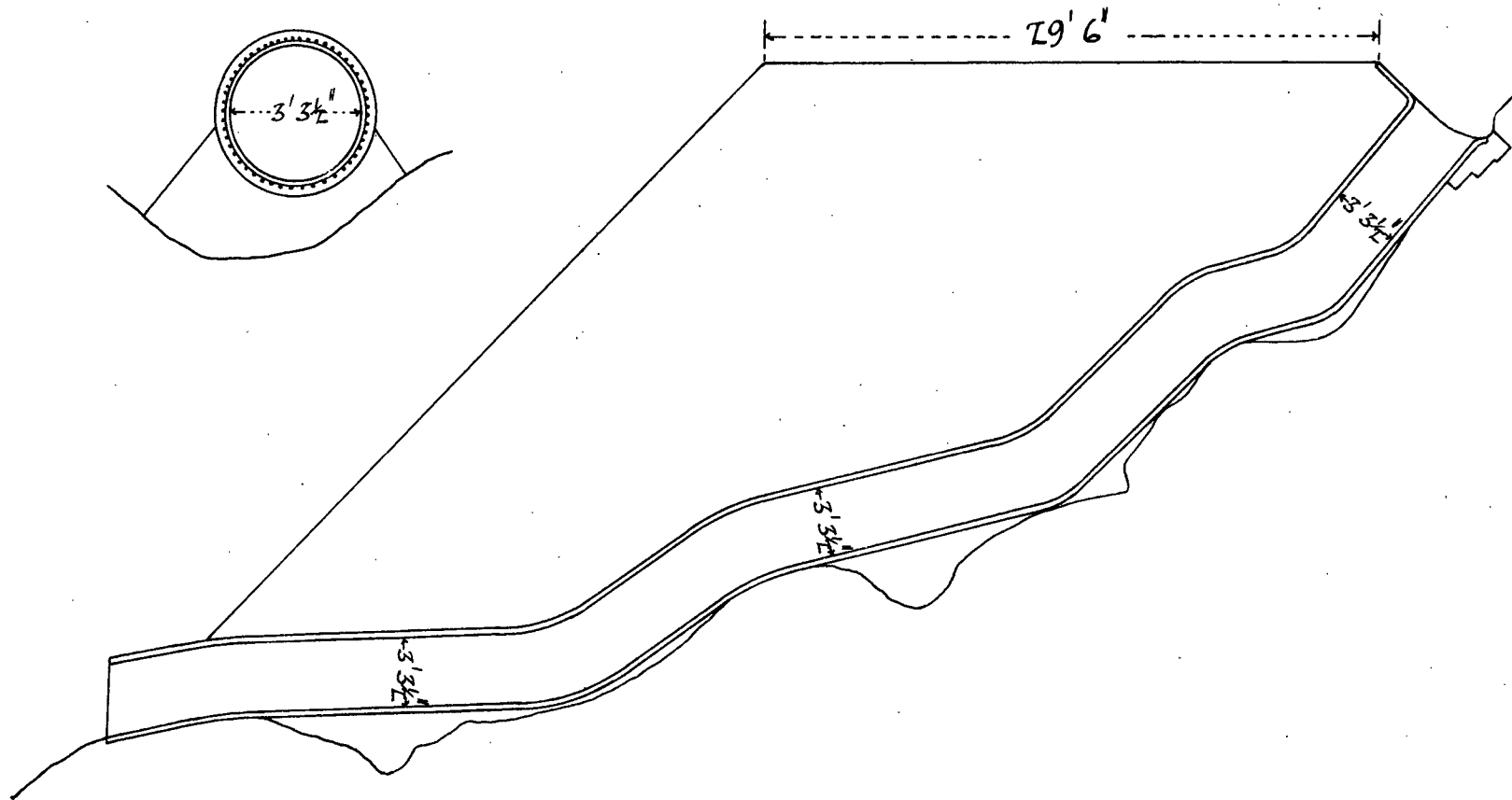




TÉST BY MR. KRAUSE AT KÖNIGSBERG (PRUSSIA).



Culvert under a Railway embankment

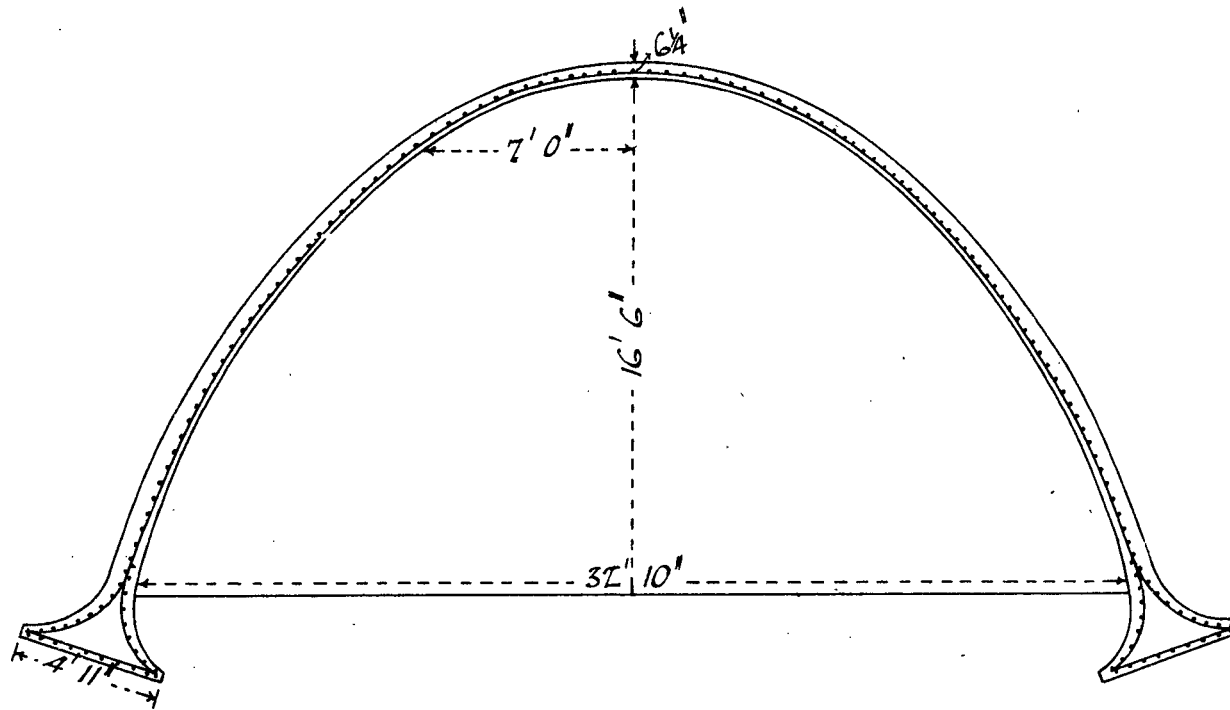


(140-)



Plate XXVIII.

# Culvert on the Great Venezuela Railway



(140-)

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,  
SYDNEY, NEW SOUTH WALES.

Plate XXIX.

Double culvert on the road from Budapest to Semlin

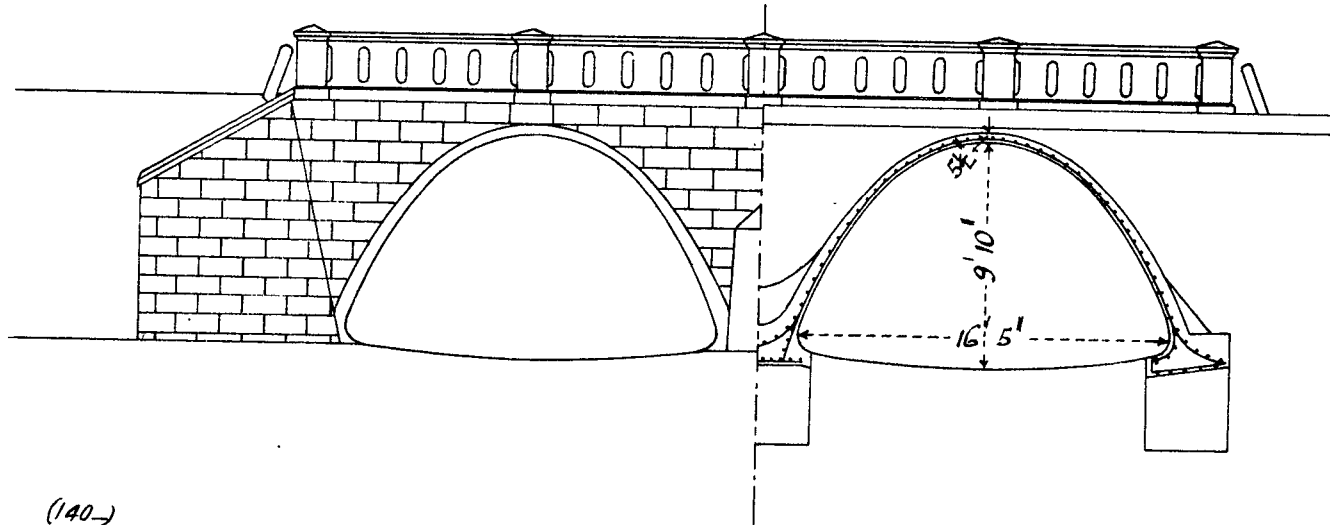
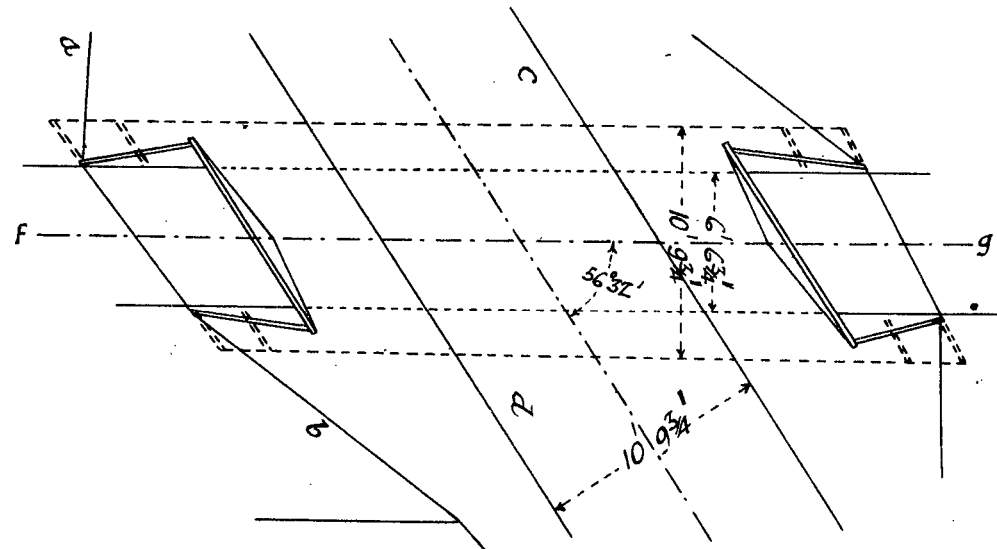
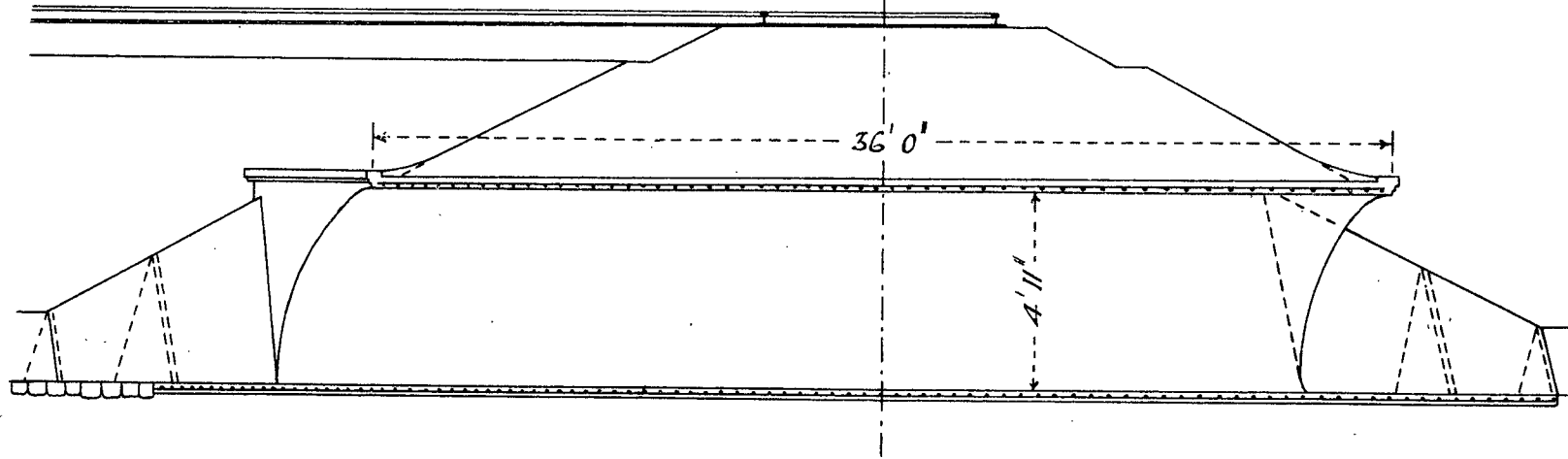


PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,  
• SYDNEY, NEW SOUTH WALES.

Plate XXX.

Culvert under the Steam Tramway at  
TELTOW



(140-)

Plate XXXI.

Culvert under the Steam Tramway at Teltow

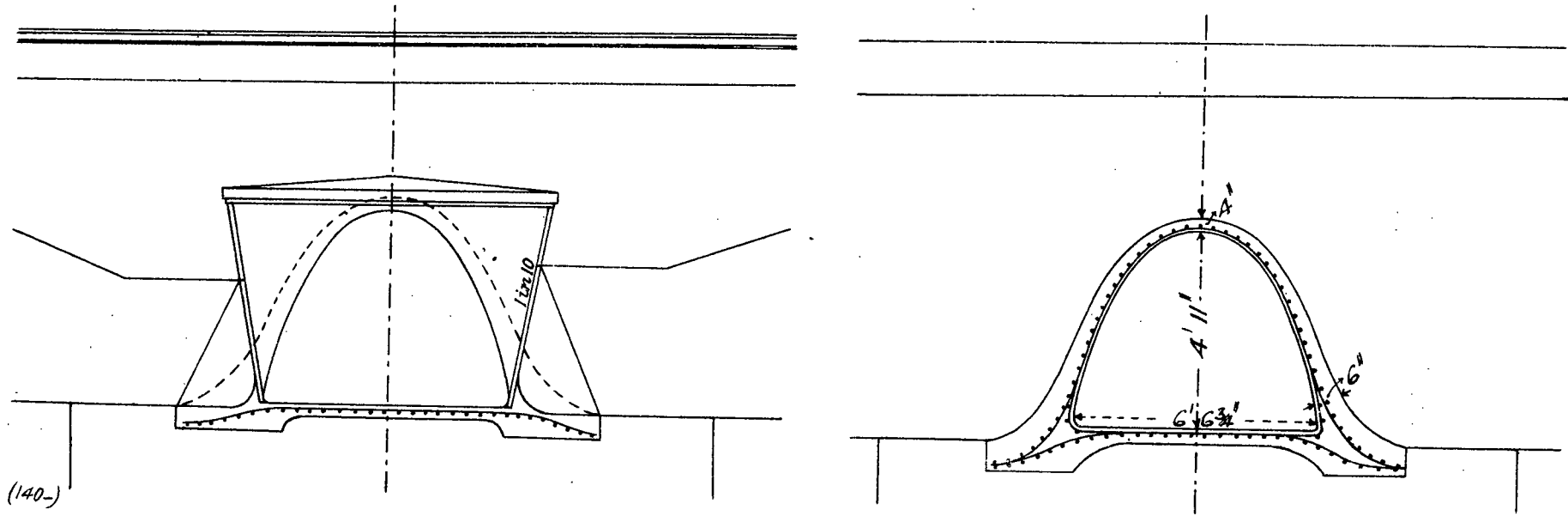
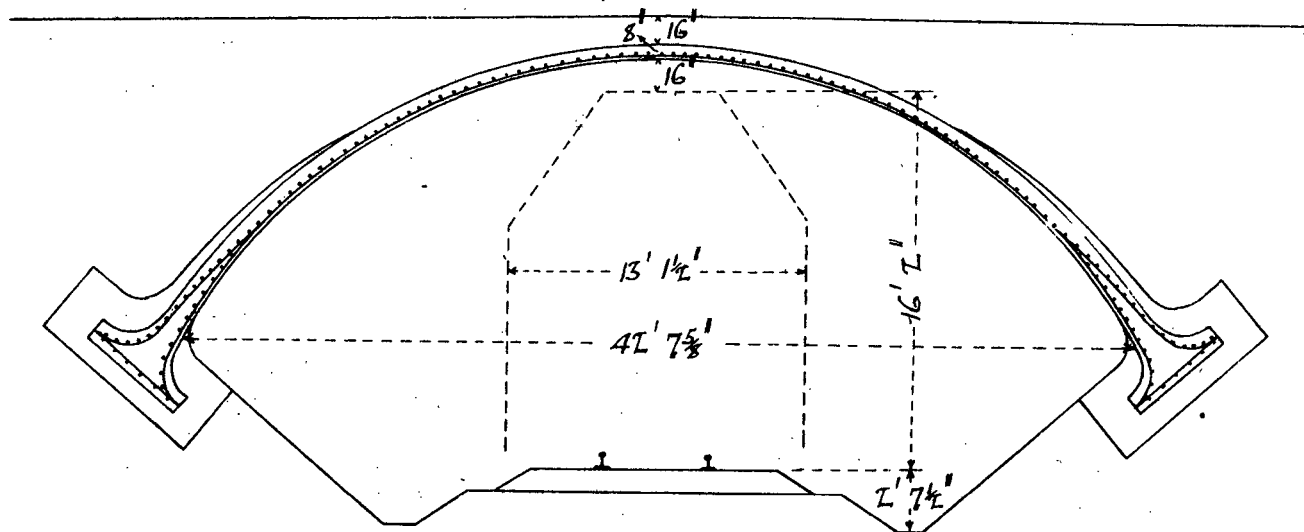


PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,  
SYDNEY, NEW SOUTH WALES.

Plate XXXII.

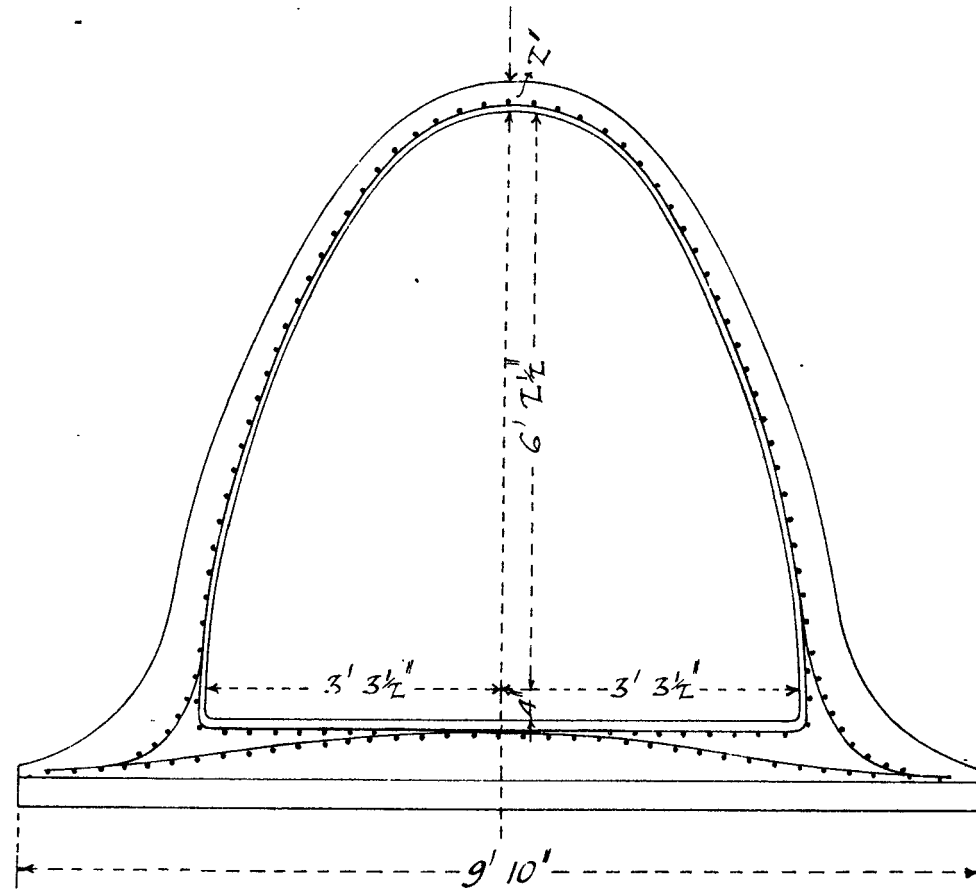
Culvert on the line of the Hungarian North East Railway



(140-)

Plate XXXIII.

Culvert at Königsburg (Prussia)

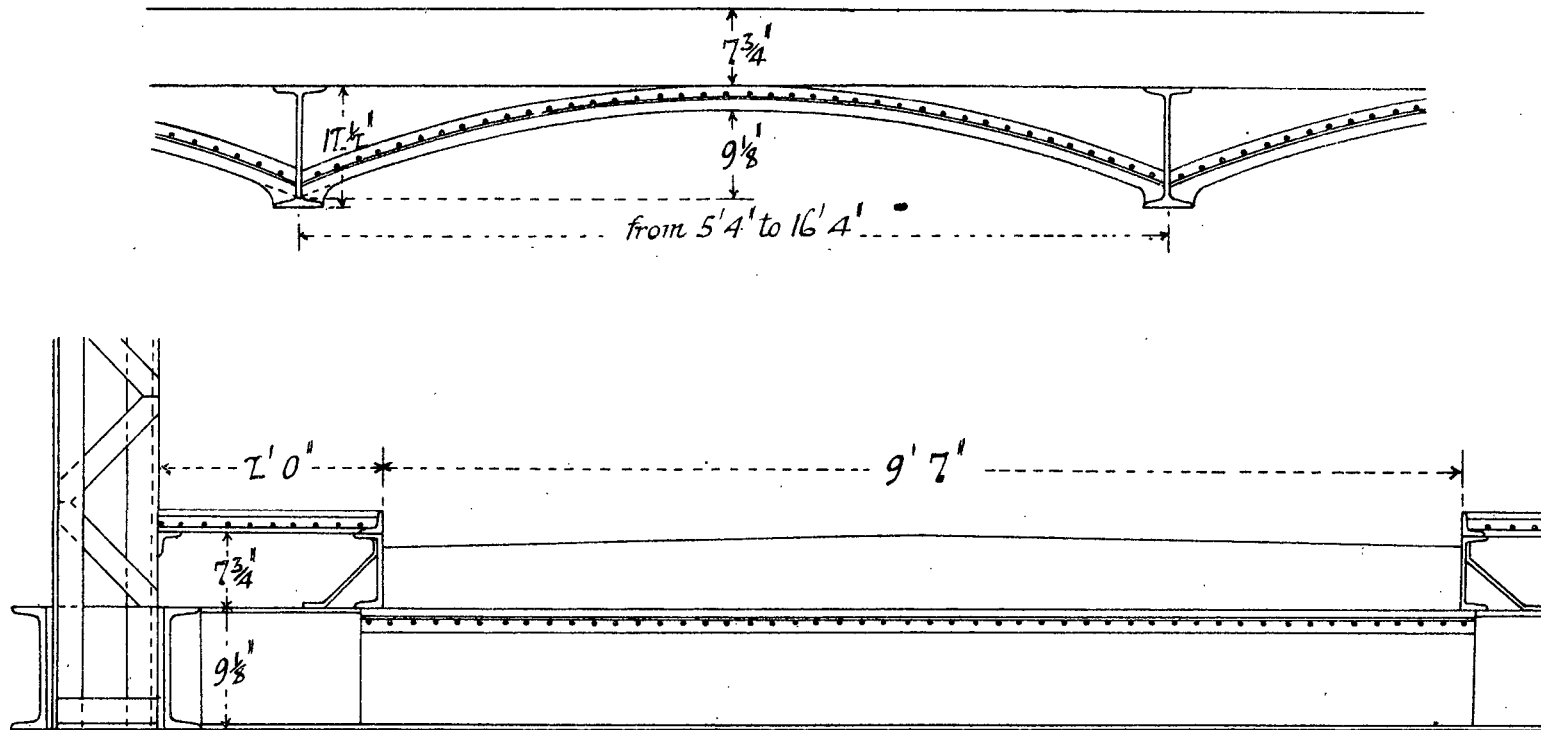


(140-)



Plate XXXIV.

Segmental arches and plates used in connection with iron Bridges

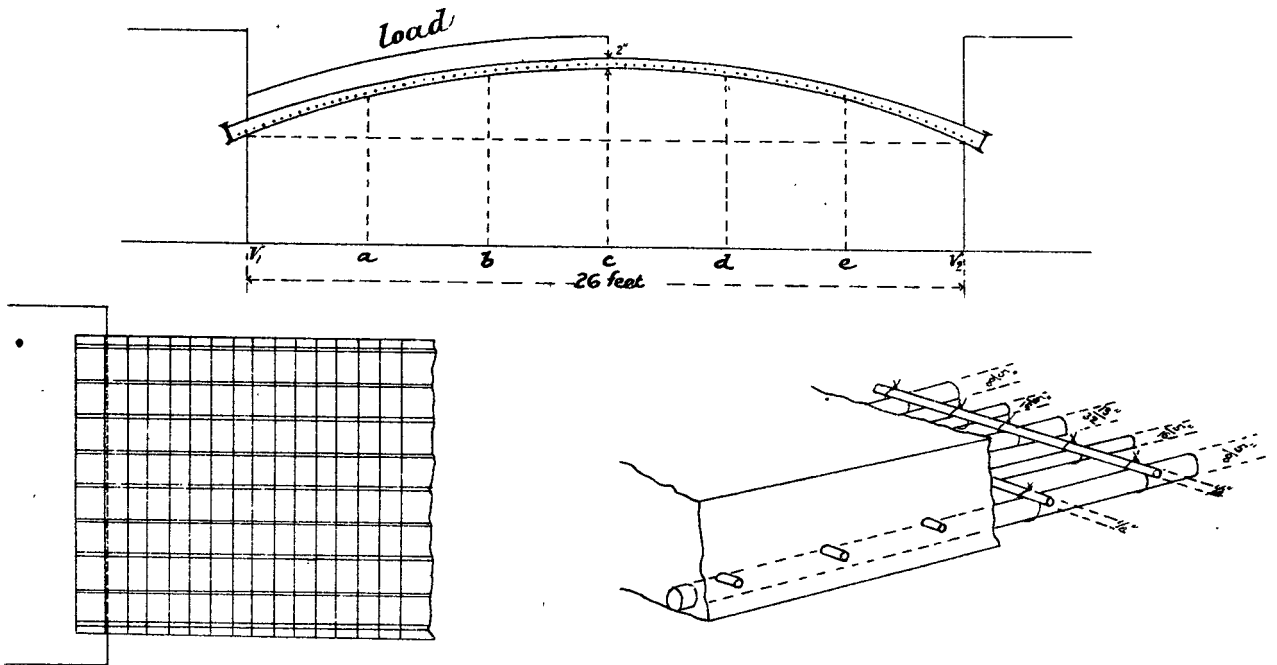


(140-)

# Plate XXXV.

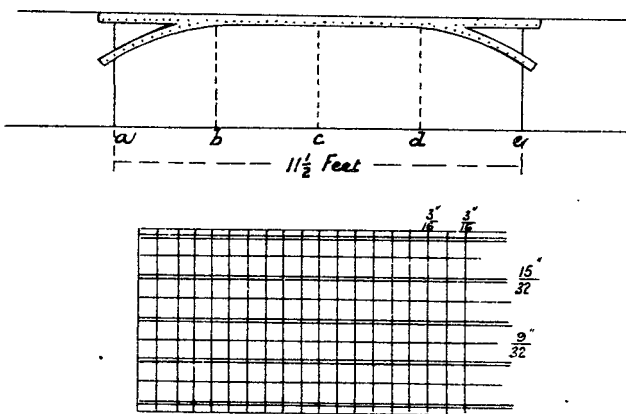
*Figs. 1 & 2 give results of experiments made by  
M<sup>r</sup> Wayss 23<sup>rd</sup> Feb<sup>y</sup> 1889  
in the presence of a number of Engineers & Architects*

Fig 1.



| Load in lbs         |      | V <sub>1</sub> | a       | b            | c      | d       | e       | V <sub>2</sub> | Remarks   |
|---------------------|------|----------------|---------|--------------|--------|---------|---------|----------------|---|
| uniformly loaded    | 0    | 0              | 0       | 0            | 0      | 0       | 0       | 0              | W <sup>t</sup> of Arch unloaded 29 <sup>lbs</sup> per sq foot |
|                     | 5550 | .              | - 5/32  | - 3/16       | 0      | + 1/8   | + 9/64  | "              | "   |
|                     | 6600 | .              | - 7/16  | - 1/2        | - 5/64 | + 9/16  | + 5/16  | "              | Fine cracks showing at most exposed parts                     |
|                     | 7800 | .              | - 29/32 | - 17/16 full | - 7/16 | + 11/16 | + 15/16 | "              | Fractured at this point of depression                         |
| + = Lifted - = Sunk |      |                |         |              |        |         |         |                |   |

Fig 2

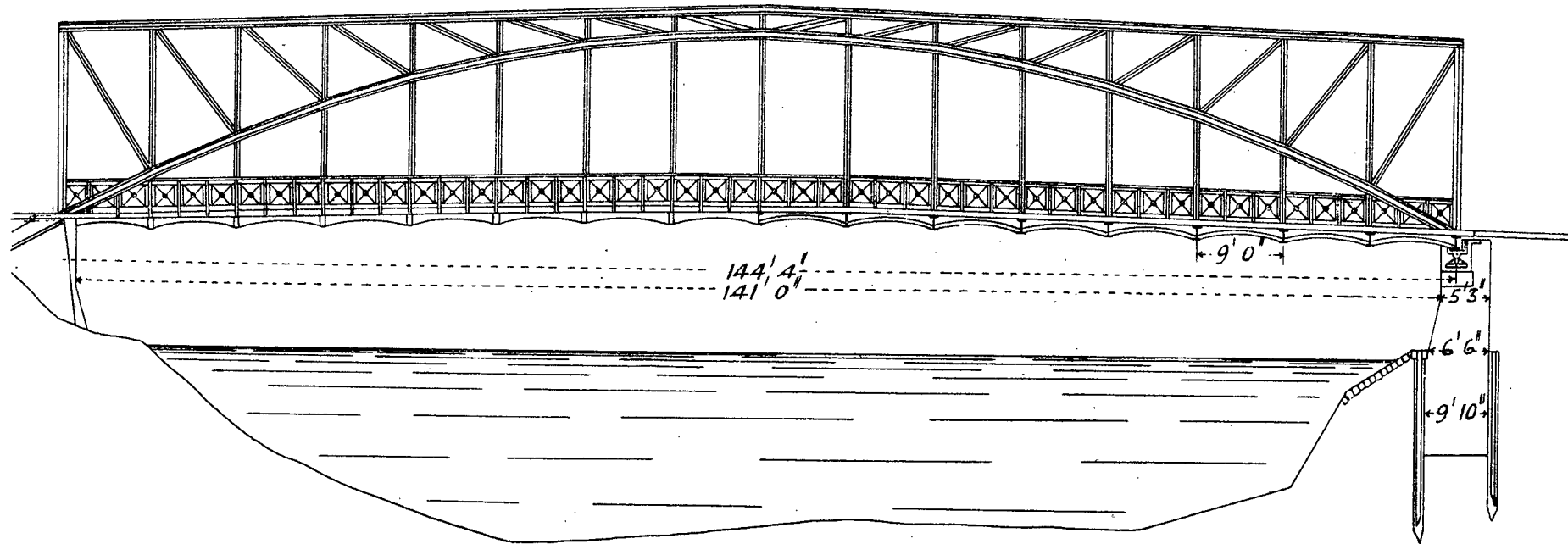


| Load in lbs | Left | Right | a | b      | c      | d    | e | Remarks                                  |
|-------------|------|-------|---|--------|--------|------|---|--|
| 6010        |      |       |   | - 1/64 | 1/32   |      |   |  |
| 6010        |      | 3848  |   | - 1/32 | 3/64   | 1/32 |   |  |
| 11090       |      |       |   | do     | - 1/8  | do   |   |  |
| 11624       |      |       |   | do     | - 5/32 | do   |   | Hair cracks at Springing                 |
| 12078       |      |       |   | do     | - 3/16 | do   |   |  |
| 13936       |      |       |   | do     | - 1/4  | do   |   |  |
| 15258       |      |       |   | do     | - 5/16 | do   |   | Cracks at Springing                      |
| 16566       |      |       |   |        |        |      |   | Cracks at centre                         |
| 21540       |      |       |   |        |        |      |   |  |
| 22200       |      |       |   |        |        |      |   | Fracture Through Edge of right Springing |

(140-)

Plate XXXVI.

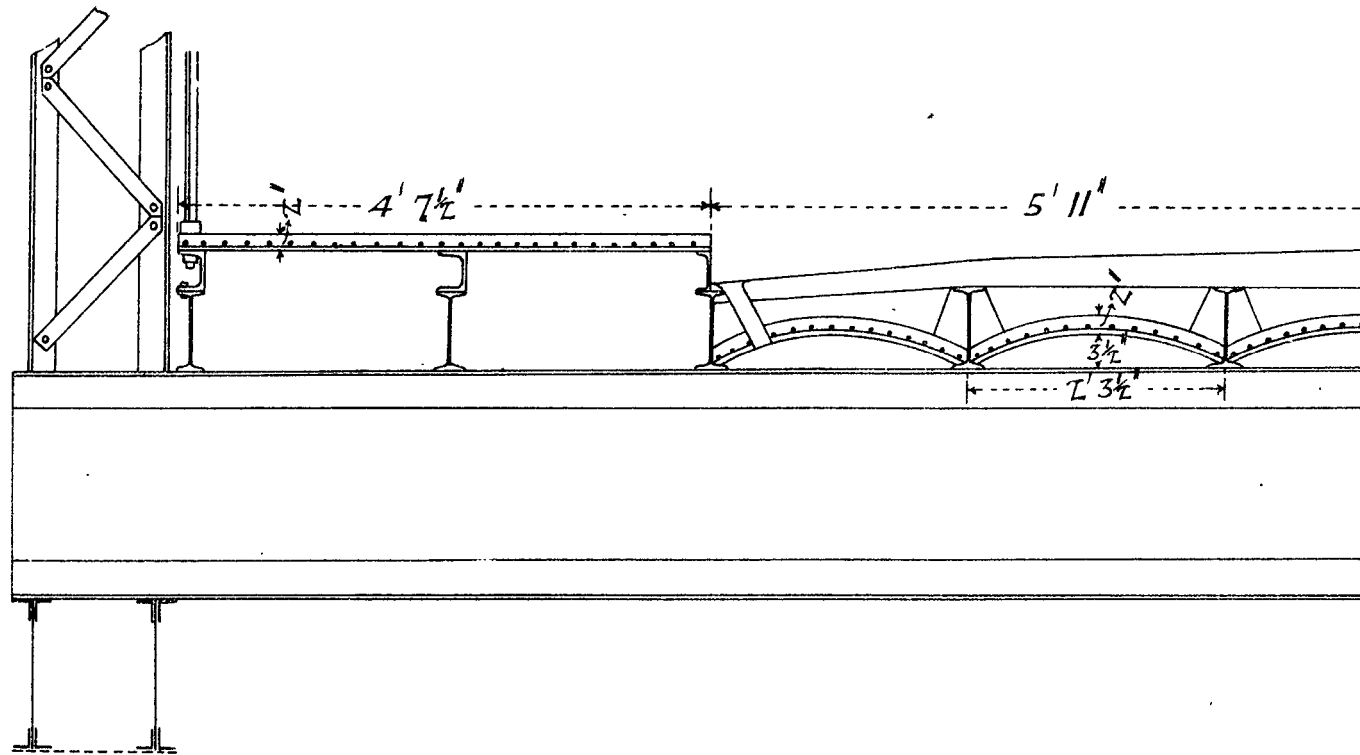
Spittel-Bridge near Jessnitz (Germany).



(140-)

Plate XXXVII.

Iron Bridge at Wetzlar (Germany)



(140-)

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,  
SYDNEY, NEW SOUTH WALES.

## Appendix No. 58.

### Report on the Monier System.

THE Monier system of construction was invented by a gardener named Monier, in Paris, while endeavouring to manufacture large flower-pots of greater durability than when made of wood, and lighter than of cement alone. This experiment so far exceeded his expectations that he applied it to water tanks with equal success. The attention of French engineers being drawn to this novel construction, they investigated it, and found that a building material of remarkable strength had been discovered. For several years the French engineers applied it successfully to constructing gas and water tanks, of which over 1,000 have been carried out in France, some of them with a diameter of 60 feet. But it was not until G. A. Wayss, a German engineer, assisted by the Government Architect in Berlin, Mr. Koenen, seeing a greater field open for so strong a building material, and experimenting with it, that it acquired its present importance to the engineering profession. They worked out the mathematical theory of straight and arched Monier constructions, which are at present considered the best, and are used in all calculations on the subject.

By the Monier system, the extremely small tensile strength of cement and its mixtures, which is to its compressive strength in the ratio of 1 to 10, is increased, by embedding wrought-iron bars in the mortar in places where the construction is subject to tension. The compressive strength of a mixture of 1 cement and 3 sand is from 2,000 to 2,450 lb.; the tensile only 200 to 245 lb. per square inch.

The iron bars used are round, from 7-32-inch to 1 inch in diameter, as found necessary, and are so placed that the stronger are in the direction of the tension, the thinner resting on the former at right angles to them, thus forming a lattice-work with rectangular meshes. The bars are only held together, at their intersection, by thin binding-wire, just sufficient to hold them in position during the process of packing the cement mortar round them, which will keep them in place when once set. If not sufficiently long, the bars are jointed by a very simple method. They are so placed as to overlap each other by twenty times the diameter of the bars, and then tied together. The cohesion between iron and cement, which is, according to Professor Baushinger, of Munich, 500 to 600 lb. per square inch, and which is not diminished by heat, is quite sufficient to form a bond. The lattice-work is calculated to withstand all the tension the structure is likely to be subjected to. To achieve this it is only necessary to take the bars in the direction of the tension into consideration, as the others are only to distribute the pressure equally over the former. When the iron structure is finished, the cement mortar, usually of 1 cement to 3 sand, is pressed through the meshes in convenient thicknesses of not over 9 inches on to the centering, which is generally  $\frac{3}{4}$ -inch clear of the iron, and well rammed. In setting, the cement mortar shrinks, and gets a firm grip round the iron, and as the cohesion between the two materials is very great, the whole forms one homogenous mass. The physical properties of this combination are very favourable. The coefficient of expansion of cement mortar is from 0.0000137 to 0.0000148, that of iron 0.0000145, or nearly the same; and even if a small difference should exist, the elasticity of the mortar is sufficient to equalise the difference. Further, in this combination the iron loses its unfortunate liability to oxidation, as cement has proved itself one of the best preservatives of iron. The very thin layer of cement surrounding the iron forms a silicate with it, very difficult to separate, which explains why iron in cement mortar does not oxidise. An aqueduct built thirteen years ago at Amiens (France) was examined, and the iron bars found not only free from rust, but in as perfect condition as when newly manufactured. Not only does cement preserve iron, but actually frees it from rust, as experiments have proved that iron bars covered with rust, if placed in cement mortar, become, after a time, perfectly clean. A structure of the foregoing description, consequently, combines all the good qualities of stone, its strength, and immunity from injury by the weather, with the elasticity of iron and daily increases in strength rather than deteriorates.

The advantages of this system compared with others are:—

- (1.) Quickness of erection without prejudice to durability and security of the work.
- (2.) Immunity from injury by water.
- (3.) Extraordinary power of resisting very high and variable temperatures.
- (4.) Great strength.
- (5.) Lightness as compared to other structures in iron or concrete alone.
- (6.) Saving in space.
- (7.) Satisfying all demands of acoustic and hygiene.
- (8.) Cheapness and neatness.

That a building material of such splendid qualities has found a very extensive application is not to be wondered at. It has already been successfully applied to bridges, sewers, reservoirs, roofs, arches, walls, floors, stairs, columns, &c.

Bridge construction by the Monier system has practically only commenced, but engineers, particularly those who have used it, are of opinion that in this direction it has especially a great future before it. It was at first very cautiously applied to bridges of small span to see how it would be effected by the vibration of vehicles and the varying loads, and as these experiments proved very successful, the width of the span was gradually increased, each fresh construction helping to give more confidence in the new system. That many authorities still reserve their opinion is quite natural. However, the many bridges which have been built under that system seem to intimate that a great number of engineers have been favourably impressed by the results, otherwise the authorities of the different countries would not have given their consent to its use in the construction of bridges, some of considerable span.

In bridge construction, the stronger bars are vertical to the springing, and reach into the interior of the abutments, which are judiciously constructed of concrete.

The South Austrian Railway Company constructed a trial bridge at Matzleindorf, in Lower Austria. The bridge had a clear span of 32.8 feet, a versed sine of 3.28 feet, and a thickness at crown of 6 inches, which increased to 8 inches towards the abutments. The iron lattice-work embedded in the cement mortar was of  $2\frac{1}{4}$ -inch mesh, with bars of  $\frac{1}{2}$ -inch and  $\frac{3}{8}$ -inch diameter, and was  $\frac{3}{4}$ -inch clear of the intrados. The cement mortar of 1 cement to 3 of sand, was laid in 9-inch layers, and rammed.

The trials consisted in placing a locomotive of 36 tons weight, and then one of 48 tons weight on the bridge, and observations made at thirteen places to measure the deflection, showed a maximum of only  $\frac{3}{8}$  inches. Then a surface of 215.29 square feet was subjected to a total weight of 98 tons 8 cwt. 1 qr. 18 lb., giving a pressure of 1,024 lb. per square foot, which caused a deflection at crown of arch of  $\frac{1}{4}$  inches. After unloading on the following day, the bridge went almost completely back to its original position. At a further trial, up to 167 tons 6 cwt. 1 qr. 5 lb., the abutments began to give way, but the total destruction of the arch was only effected when the load had been increased to 193 tons 2 cwt., or a pressure of 2,009 lb. per square foot.

The Railway Company was so satisfied with these results that they intend to rebuild all overhead street crossings on the Vienna-Neustadt line, by the Monier system.

In 1890, at the Exhibition in Bremen, a bridge for foot-passengers, of 130.6 feet span, was constructed, with a thickness of only 9 $\frac{3}{4}$ -inch at the crown.

But bridges of the same span have also been erected for vehicular traffic; for example, at Wildegg, Switzerland, with a thickness of 8 inches at crown and 9 $\frac{1}{2}$  inches at springing.

The following bridge in the park of the cement factory, "Stern," Germany, shows the immense strength of the new system, compared with structures of concrete alone, in the most striking manner.

Side by side with an arch built of concrete alone of a span of 114.8 feet, 13.12 feet versed sine, and a thickness at crown of 3.28 feet, another was erected by the Monier system of about the same span and versed sine, but a thickness at the crown of only 4 inches. Both together carry a pavilion entirely constructed by the Monier system. The centerings of the Monier arch were taken away after five days 14 hours, and notwithstanding the very great weight it was subjected to, even if the weight of the pavilion be omitted, being still 485.04 lb. per square inch compression, and 180.6 lb. tension, the arch did not show the least deflection. A design for a bridge of 260 feet span for a county in Thuringen, Germany, was exhibited in spring, 1890, but no further particulars are to hand.

In bridges of very great spans it has been found advisable not to use this system exclusively, but conjointly with iron constructions, especially for bridge decking, as it is lighter than brick or concrete, and more durable than buckled-plates. In underground work the Monier system has especially been used for pipes and sewers, but also for tunnel constructions both in Germany and Venezuela.

In the construction of sewers two iron lattices are used, one near the inner surface and one near the outer surface of the sewer, or one lattice forming an ellipse with the larger axis corresponding with the springing-line, so that the lattice nears the inner surface at crown and invert, and the outer surface of sewer at springing, thus counterbalancing all tension in the construction.

Pipes

Pipes of 6.56 feet diameter and 4 inches in thickness all round were used in Königsberg. These showed only cracks, when subjected to a compression 1 ton 3 cwt. per square foot, and at a compression of 1 ton 18 cwt. per square foot, the pipes showed a deflection of  $9\frac{1}{2}$  inches, which left a permanent deflection of only 2 inches. The same pipes subjected to inside pressure, commenced to show a little expansion at 62 feet head of water, or 26.87 lb. per square inch.

Up to 12 inches the price of these pipes is pretty much the same as common cement pipes, but a saving of 10 to 12 per cent. is effected in larger pipes. The weight of a cement-pipe of 3.28 feet diameter is per lineal foot 504 to 571 lb., a Monier pipe of the same dimensions weighs only 215 lb. per lineal foot.

A sewer of 48.5 chains length and 4.92 feet diameter was constructed at Offenbach, Germany, in the year 1886, and showed when inspected by the authorities in 1890, neither injury to the cement mortar, nor oxidizing of the iron. A length of  $4\frac{3}{4}$  miles is now in process of construction.

Canals for water and gas pipes, cables and electric wires, have proved so successful that in Berlin there is already a length of  $3\frac{3}{4}$  miles laid down.

The Monier system is chiefly applied to buildings. It is used for walls, floors, staircases, roofs, and even whole houses with hardly any other material. The illustrations attached show some of its most general applications. Strength, saving in space, fire-proof condition, lightness, &c., brought it into such favour as a building material. A great number of experiments were made to test its suitability, before using it in new constructions, and as this illustrates better its remarkable advantages compared with other building materials, the most important may here be mentioned.

Two exactly similar plates, one of Monier construction, the other of cement-mortar alone,  $1\frac{1}{2}$  inch thick, and each on supports 3 ft.  $3\frac{3}{8}$  in. apart, were loaded. The plate of cement mortar, on being subjected to a pressure of 108 lb. per square foot, broke. The Monier plate carried 573 lb. per square foot, and showed a deflection of  $\frac{1}{2}$ -inch, but was still able to carry the load.

Professor Baushinger's experiments show a still greater difference. A plate of cement mortar on supports 4 ft. 11 in. apart carried 136.8 lb. per square foot, while a Monier plate of the same thickness carried 1,658 lb. per square foot, or about twelve times as large a weight, which the lattice-work still supported after the plate cracked.

A Monier plate on supports 6 feet apart, with a thickness of 2 inches, was tested nine days after construction.

|  |
|--|
| A load of 873 lb. caused a deflection of $1\frac{3}{16}$ inches. |
| "   1,183   "   "   " $1\frac{1}{8}$ "                           |
| "   1,737   "   "   " $1\frac{5}{8}$ "                           |
| "   2,477   "   "   " $1\frac{3}{4}$ "                           |
| "   2,857   "   "   " $1\frac{7}{8}$ "                           |

Although the last load amounted to 238 lb. per square foot, no injury was done to the plate which, after the removal of the load, went almost completely back to its original position, only leaving a permanent deflection of  $\frac{1}{2}$ -inch. A similar plate, but of cement mortar alone, was not able to carry its own weight if placed on supports 6 feet apart.

A similar Monier plate, but on supports 3 ft. 10 in. apart, showed a fine crack at the under side when subject to a load of 9,000 lb. When this load, in which was included five men, was set moving it cracked the plate, which, notwithstanding this, carried the load, showing only a deflection of  $1\frac{1}{2}$ -inch.

A Monier plate  $3\frac{1}{2}$  inches thick, with a more ingenious lattice, and supported 3 ft. 9 in. apart, carried a load of 18,000 lb. on 11.7 square feet, or 1,538 lb. per square foot. This load caused a deflection of  $\frac{1}{2}$ -inch without cracking the plate, or causing any other damage.

Monier plates, if placed vertically, will serve as walls, and tested as to their strength for this purpose, have given splendid results.

A standing wall free of support for 12 feet, was loaded with 20,000 lb., and showed no trace of damage, even after holes were cut through it to try its strength. The reason why a Monier wall is able to carry such a great load if free of support up to a considerable distance, is that it may be considered a kind of lattice girder, of considerable height. In arch form it is applied to ceilings, roofs, &c.

In the case of an arch of 6 feet span and  $1\frac{1}{2}$ -inch thickness:—

|   |
|---|
| A load of 2,000 lb. caused a deflection of $\frac{5}{16}$ inches. |
| "   2,900   "   "   " $\frac{1}{2}$ "                             |
| "   3,300   "   "   " $\frac{3}{8}$ "                             |

The load being removed the arch completely regained its former position. Twenty days later the same arch was loaded with 12,000 lb., which caused a deflection of  $\frac{3}{4}$ -inch, being caused to a certain extent by the supports giving way about  $\frac{1}{8}$ -inch. The load being removed showed a permanent deflection of  $\frac{3}{8}$ -inch.

The results of two more tests are shown on accompanying drawing, fig. 1 and fig. 2.

Tests made to ascertain the heat-resisting qualities of Monier constructions gave even more remarkable results. A Monier pipe 6 feet  $6\frac{1}{2}$  inches long,  $1\frac{1}{2}$  inches thick, and  $27\frac{1}{2}$  inches diameter was placed perpendicularly and used as a furnace. Above the pipe were placed on iron bars two Monier plates of 2 inch thickness. Amongst other alloys of tin, zinc, and lead placed in the furnace for fixing the temperatures was a bar of brass 40 inches over the fire bars. After two hours burning the alloys melted, and the iron bars below the Monier plates became dark red, indicating a temperature of about 1,300 degrees Fahrenheit, at the under side of the plate. When the plates were taken off lead, placed on them, melted. One of the plates 40 inches long, 2 inches thick, and  $25\frac{1}{2}$  inches wide, showing a deflection of  $\frac{1}{2}$ -inch, and some fire cracks was then laid on two supports, and loaded in the centre up to 575 lb., without altering in the least. When the load was increased to 1,140 lb. and 1,375 lb., there were deflections of  $\frac{5}{16}$  inches and  $\frac{1}{2}$  inches, respectively. As the plate cooled the deflection was reduced to  $\frac{1}{16}$ -inch, which diminished to nearly  $\frac{1}{4}$ -inch, when the load was taken away. An examination of the plate showed that with the exception of the fire cracks it had not been damaged, and was still able to carry a load sufficient for general purposes.

That the plate is bent more when the heat is increased is theoretically right, and proves that the expansion of the iron and the cement mortar is the same, as the latter would otherwise have broken.

The pipe used as the furnace stood a temperature of more than 1,900 degrees Fahrenheit (the brass bars melted), for more than two hours, and was very little damaged. A gauge about 40 inches long showed the greatest expansion as  $\frac{1}{16}$  inches. The pipe showed fine fire cracks, but otherwise retained its shape and strength.

An experiment made at Copenhagen with a Monier plate which was placed on supports 40 inches apart, and loaded with 1,400 lb., at only 12 inches above a very fierce fire. After an hour exposure, the deflection of the plate amounted to  $\frac{1}{2}$ -inch, which was reduced to  $\frac{3}{8}$ -inch by cooling with water. After two hours' more exposure to the heat, the deflection amounted again to  $\frac{1}{2}$ -inch, but the plate having been cooled by water, assumed very nearly its original shape. The plate was completely unhurt and free from fire cracks.

The fire of Mr. H. Helbing's spirit distillery, in Wandsbeck, near Hamburg, on 21st December, 1889, may be taken as an experiment on a very large scale. The roof above a  $1\frac{1}{2}$ -inch thick Monier floor caught fire and was completely burnt. The floor not only completely resisted the immense heat and the falling fragments of roof, but also the sudden reduction in temperature caused by the water, and thus protected entirely the large spirit store underneath.

To show that already several years ago the authorities in Germany recognised the good qualities of the new system, it may be mentioned that the President of Police in Berlin allowed, on the 18th June, 1887, the use of the Monier system in the erection of perfectly fire-proof constructions.

Arched Monier constructions, forming ceilings for lower storeys and floors for the one above, have been extensively used for factories, warehouses, &c. The goods stores round the harbour of Trieste have 64 acres and Loewe's rifle factory in Berlin, 29.5 acres of Monier ceilings.

In a printing office in Berlin a printing machine is working on an arched Monier ceiling of 16.5-foot span without doing it any injury.

At Copenhagen, arched ceilings of 12 feet span have been built for the new steam laundry at St. John's Hospital, and of 24 feet to 30 feet span for the new Art Gallery.

This kind of construction will answer equally well for roofs, and is used to a great extent in Germany and Austria. The glass works at Stralan, near Berlin, and latterly those for Hellerup, near Copenhagen, where the roofs have a span of 30 feet to 40 feet, and are  $2\frac{1}{2}$  inches to  $2\frac{3}{4}$  inches thick at crown, may here be mentioned. They are covered with Goudron paint, which has to be applied hot, and which has made a name for itself in Germany.

These arched ceilings and roofs are used with advantage where it is necessary to economise the materials of the outer walls, as the thrust with this construction is very small,

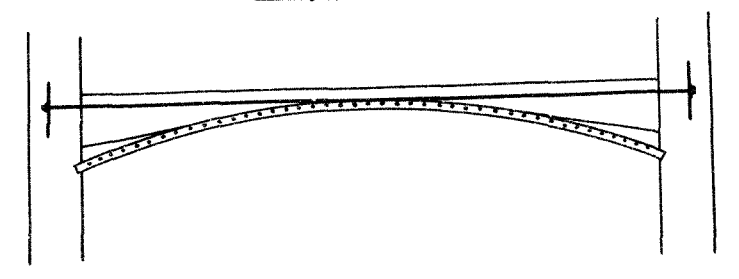
Perfectly



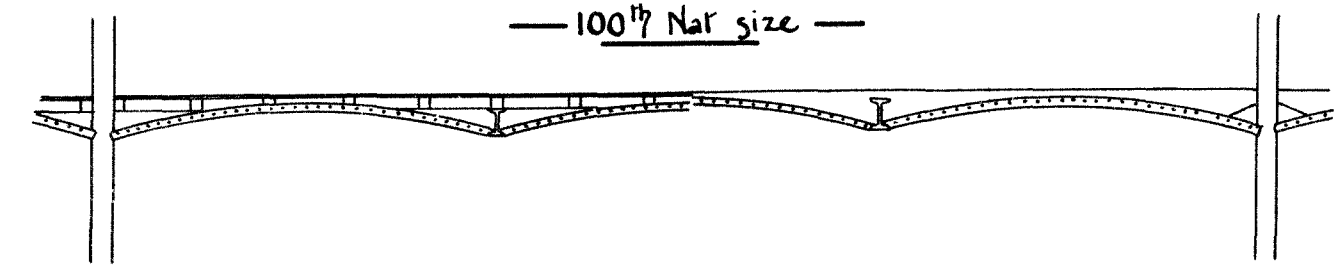
# — Mozier System —

Appendix 58.

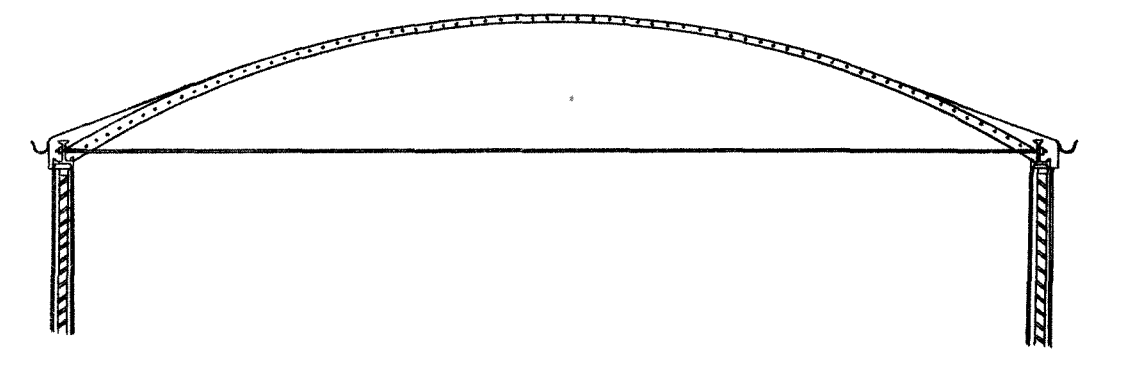
— Flooring for Municipal Buildings —  
 — New Art Gallery Copenhagen. —  
 — 100<sup>th</sup> par size —



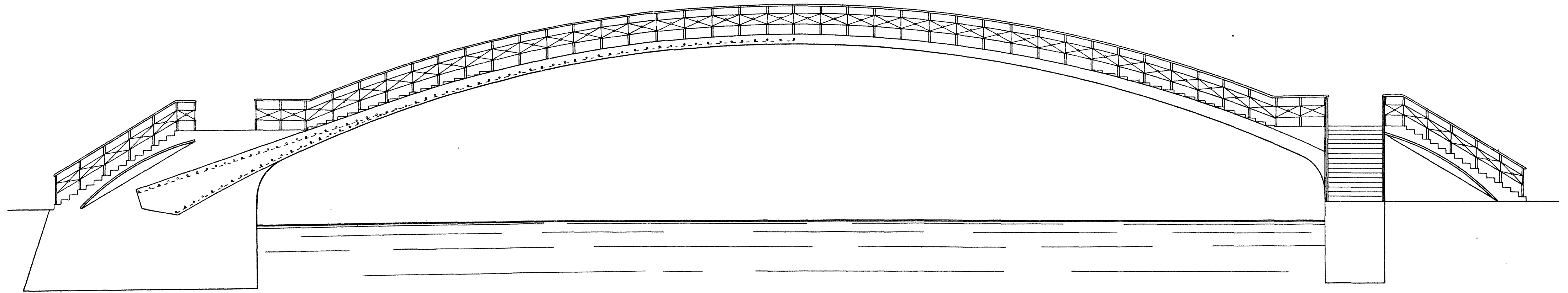
— Flooring for Warehouses and Factories —  
 — Steam Laundry of St John's Hospital near Copenhagen. —  
 — 100<sup>th</sup> par size —



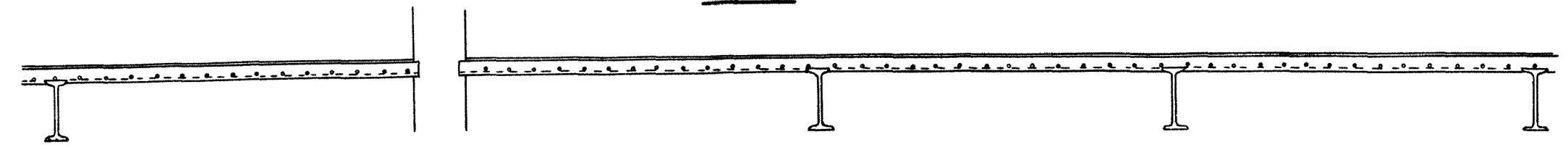
— Roof Construction for Factories or Warehouses. —  
 — Hellerup Glassworks Copenhagen. —  
 — 100<sup>th</sup> par size —



— Bridge Construction of 130'7" Span. —  
 — Bremen Exhibition 1890. —  
 — 100<sup>th</sup> par size —



— 2<sup>g</sup> for Factories, Stores etc. —  
 — 24<sup>th</sup> par size. —



Perfectly level ceilings, answering at the same time for floors of the storey above, have also been constructed, the Monier plates resting on girders. Whole houses have, in fact, been built under that system, amongst which may be cited the glass works at Stralau, near Berlin, with walls of great height; the Crystal Palace, in Leipsic; a bathing establishment and a church at Munich; ice-houses in Potsdam, for which walls were built double, connected at intervals, and the intermediate space filled with a non-conducting material. Monier plates also make a very good flagging for footpaths, yards, &c. Its lightness and great strength greatly facilitate the laying of pipes for water and gas without being liable to break if not properly handled and sufficiently packed underneath. It has also been successfully applied to bomb-proof rooms in the fortifications of Germany.

At the new harbour at Copenhagen it was used for breakwaters. Hollow blocks of concrete of fixed magnitude, without exceeding a certain weight, were used, and connected on the Monier system.  
8 June, 1892.

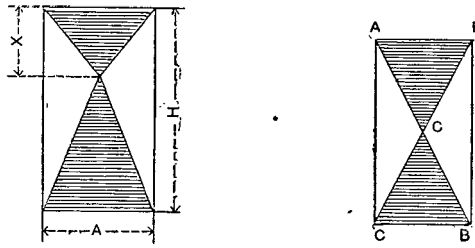
W. BALTZER.

Appendix No. 59.

(Papers referred to on stress sheet of Monier arch, Contract No. 77.)

FORMULÆ for the calculation of Monier beams, plates, &c.

A BEAM or girder built on the Monier principle is briefly a concrete or compo. structure fortified with an iron mesh comprised of bars laid longitudinally and transversely and bound at crossings with wire, the iron mesh being inserted on the side subjected to tension. It can be seen at once that if the tensile strength of concrete was as great as the compressive, instead of the



modulus of rupture being about 150 lb. it would be nearer 2,000 lb., and there seems no reason why iron should not be inserted for this object, more especially as the expansion of the iron and concrete is, under ordinary circumstances, almost identical, namely, .000012 for every degree Cent. There is also in favour of this class of structure the great amount of cohesion between the iron and the concrete varying from 350 lb. up to 500 lb., so that in rods of small diameter, if twenty times the diameter of the rod be embedded in the concrete it will have the same holding power as the strength of the rod, and moreover the cement protects the iron in such a way as to permanently arrest oxidation. To arrive at the formulæ necessary to calculate the strength of a Monier plate or beam, we must first analyse the existing formulæ for girders. Taking the ordinary formula for a rectangular beam, we have the moment of rupture  $C \times B \times D^2$  where C = strength of material, B = breadth, D = depth.

We may arrive at the same result by the following method. In any rectangular girder in which the material has the same tensile and compressive strength the neutral axis must be the centre of the girder, and the outer edge has the maximum strain which will diminish to nothing at the centre, and therefore the triangle ABC in Fig. 3 shows the section of material strained, and the line joining the centre of gravity of the two triangles represents the leverage—thus taking an example, say, a girder 20" deep by 6" broad constructed of iron, capable of standing, say, 5 tons per square inch, then by the ordinary formula we have—

$$\frac{400 \times 6 \times 5}{6} = \text{modulus of rupture} = 2,000 \text{ tons.}$$

By method No. 2. Area of either triangle would equal  $10 \times 3$ , and the leverage would be equal to  $2^2$  of 20. ∴ modulus of rupture =  $\frac{5 \times 10 \times 3 \times 20 \times 2}{3} = 2,000$  which is the same result.

But in the case of a girder constructed of concrete, the tensile and compressive strength of which, we will assume, is as 400 is to 2,000, it is natural to suppose that the neutral axis will, before rupture takes place, deviate from the centre of the figure as the girder will be in equilibrium round the neutral axis; therefore, in Fig. 9, if we call  $x$  the distance of the neutral axis from the nearest edge—A, the breadth of the beam, and H the total height, we have  $5 \times A \times x \times \frac{2}{3}x = A \times (H - x) \times \frac{2}{3}(H - x)$

$$\phi \therefore x = \frac{-H \pm \sqrt{5H^2}}{4} \text{ and solving this we have}$$

$x = .3089$  when  $H = 1$ . If we take a girder therefore 6" wide and 20" deep, the neutral axis would be  $20 \times .3089$  or 6.178" from the nearest edge, and the moment of resistance would be

|   |                   |                |
|---|-------------------|----------------|
| Area.   | Leverage.         | Strain.        |
| $(3 \times 6.178) \times (6.178 \times 2 \times 2)$ | $\frac{2,000}{3}$ | $\times 2,000$ |
| = 305,336.  |                   |                |

working this same girder by ordinary formula, taking the modulus of rupture as equal to the tensile strength, say 400 lb., the moment of resistance would be 160,000 lb. If we consider another example of the same girder, but taking the tensile strength at 200, and the compressive strength at 2,000 or as 1 is to 10, then we have—

$$10 \times (A \times x) \times (\frac{2}{3}x) = (A \times (H - x)) \times \frac{2}{3}(H - x)$$

$$10 A x^2 = A (H - x)^2$$

$$x = \frac{-H \pm \sqrt{10H^2}}{9}$$

if  $H = 1$  then  $x = .2402$ , and the distance of neutral axis from the nearest edge =  $20 \times .2402$  or 4.804 inches; and the moment of resistance

$$= (3 \times 4.804) \times \frac{(4.804 \times 2 \times 2)}{3} \times 2,000$$

$$= 3 \times 23.078 \times 4 \times 2,000 = 184,626.$$

Then by ordinary formula the moment of resistance would be 80,000 lb. If we take an example of a cast-iron beam, in which we may assume the tensile strength to be about 16,000 lb., and the compressive about 96,000 lb., that is to say as 1 : 6, we have  $6ax \times \frac{2}{3}x = a \times (H - x) \times \frac{2}{3}(H - x)$

$$6ax^2 = a(H - x)^2$$

$$x = \frac{-H \pm \sqrt{6H^2}}{5}$$

and if  $H = 1$  then  $x = .2899$ , and taking the same girder, that is  $20'' + 6''$ , the distance of the neutral axis from the nearest edge  $= 20 \times .9$  or  $5.8''$ , and the moment of rupture would equal  $\frac{3 \times 5.8 \times 5.8 \times 2 \times 2 \times 96,000}{3} = 33.64 \times 4 + 96,000 = 12,917,760$

Now by ordinary formula taking modulus of rupture as deduced from experiment by Rankine we have  $\frac{400 \times 6 \times 40,000}{6} = 16,000,000$

which is a result slightly in excess of my formula, but this might easily be explained by the great variation in strength of cast-iron. We shall now consider a Monier plate girder tested by Mr. Roberts, of the Public Works Department, N.S.W., the dimensions of the girder being as follows:—Breadth,  $18''$ ; depth,  $2''$ ; distance from centre of bars to top  $1.5625''$  and area of bars  $.392''$ . Let  $A$  = area of iron;  $b$  = breadth of girder;  $h$  = height of girder;  $x$  = distance of neutral axis from bottom of girder.  $C$  = tensile strain in iron (say 5 tons) =  $11,200$  lb.;  $D$  = compression strain in concrete (say  $400$  lb.);  $\therefore C : D :: 28 : 1$ , and by formula

$$CAx = \frac{b}{2}(h-x) \times \frac{2}{3}(h-x) \times D$$

$$28Ax = \frac{b}{3}(h-x)^2$$

$$A = 0.392 \quad b = 18'' \quad h = 1.5625''$$

$$\therefore 28 \times .392 \times x = \frac{18}{3}(1.5625 - x)^2$$

$$10.966x = 6(1.5625 - x)^2$$

$$1.8293x = (1.5625 - x)^2$$

$$x^2 - 4.9543x = 2.4414$$

$$x = .555$$

Deducting .555 from the real depth  $1.5625$  we have  $1''$  as distance from outer edge, and the moment of resistance will be  $\frac{\text{Area} \times \text{Leverage}}{(9'' \times 1) \times (1 \times 2 \times 2) \times 2,000} = 24,000$  lb.

The girder was broken by  $3,900$  lb. applied at centre, supports being  $30''$  apart; therefore bending moment  $= \frac{3,900 \times 30}{4} = 29,250$

which is slightly in excess of the result obtained by the formula. There is very little doubt, however, that the neutral axis does not deviate from the centre of gravity of the figure until the modulus of elasticity is exceeded; if this be the case, it would be advisable in a Monier beam to proportion the iron so that the neutral axis would be in the centre until rupture took place. The solution of the equation would then be:—Let  $A$  = Area of iron;  $d$  = depth of girder (measured from centre of iron to upper side of concrete);  $B$  = breadth;  $C$  = compressive strength in concrete;  $P$  = tensile strength in iron;

$$P \times \frac{d}{2} \times A = \frac{(B \times d)}{4} \times \left(\frac{d}{2} \times \frac{2}{3}\right) \times C$$

$$P \times \frac{d}{2} \times A = \frac{B \times d \times d}{4} \times C$$

$$A = \frac{12}{B \times d \times d \times C \times 2} \times P \times d$$

$$A = \frac{6 \times P}{B \times d \times C}$$

Take for example a concrete beam  $2.5''$  deep and  $12''$  broad. Then  $A$  would equal

$$\frac{12 \times 2.5 \times 500}{11,200 \times 6} = \frac{150.0}{672} = .223 \text{ inches}$$

Say bars  $5/16''$  dia.  $= .(767) \cdot \frac{.2230}{.2301} (3)$

$= 3$  bars per foot  $5/16''$  dia.

I have included a table based on actual experiments on concrete beams, and it is interesting to note that as the age of the concrete advances and the final strength is approached the results obtained by experiment are almost identical with the results obtained by my formula, and are obtained with a substance having compressive strength nearly eleven times the tensile strength. Taking the last two examples, in one we have the moment of resistance by the above formula as  $186,700$  and by experiment  $183,000$  lb.; and in the last experiment the moment of resistance by my formula is  $202,184$  lb., and as deduced from the experiment  $218,484$  lb.

CEMENTS ONLY.

| Age.                            | Tensile strength in lb. per sq. inch. | Compressive strength in lb. per sq. inch. | Ratio C in formula (1). | $\sqrt{c}$ | X in formula (1). | $4X^2$ in formula (2). | Moment of rupture by formula (2). | Modulus of rupture by experiment. | Moment of rupture by formula (3). | Remarks.   |
|---------------------------------|---------------------------------------|---|-------------------------|------------|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Increasing from 3 to 12 months. | 134.7                                 | 1,932.0                                   | 14.3                    | 3.78       | 4.18              | 69.89                  | 135,027.0                         | 280.5                             | 112,200                           | Beams $20'' \times 6''$<br>$h$ = depth.<br>$b$ = breadth.<br>$c$ = ratio of compression to tensile strain.<br>$X = h(\sqrt{c}-1)$ (1) $x$ = distance of neutral axis from nearest edge.<br>Mt. Rupt. = $4X^2f$ (2).<br>Mt. Rupt. = $400f^2(3)$ $f$ = compressive strain.<br>$f_1$ = modulus rupture by experiment. |
|                                 | 143.5                                 | 1,240.7                                   | 8.65                    | 2.94       | 5.08              | 117.86                 | 146,228.9                         | 277.1                             | 110,840                           |  |
|                                 | 201.14                                | 1,854.1                                   | 9.2                     | 3.03       | 4.95              | 98.01                  | 181,720.3                         | 376.9                             | 150,760                           |  |
|                                 | 152.74                                | 1,100.1                                   | 7.2                     | 2.68       | 5.42              | 117.51                 | 129,272.7                         | 288.6                             | 115,440                           |  |
|                                 | 172.00                                | 1,617.0                                   | 9.4                     | 3.066      | 4.92              | 96.83                  | 156,574.1                         | 373.3                             | 149,320                           |  |
|                                 | 201.5                                 | 2,068.7                                   | 10.26                   | 3.20       | 4.75              | 90.25                  | 186,700.2                         | 457.5                             | 183,000                           |  |
|                                 | 224.4                                 | 1025.9                                    | 9.03                    | 3.005      | 4.995             | 99.80                  | 202,184.8                         | 546.2                             | 218,480                           |  |

TIMBER ONLY.

|                 |        |        |       |       |      |       |           |        |           |  |
|-----------------|--------|--------|-------|-------|------|-------|-----------|--------|-----------|--|
| Grey iron-bark. | 25,080 | 10,165 | 2.467 | 1.57  | 7.77 | 241.5 | 6,0       | 17,866 | 7,146,400 | Formulae as above except $c$ = ratio of tension to compression.<br>Results of tests are the averages of a large number of tests. |
| Tallow-wood.    | 16,165 | 6,753  | 2.394 | 1.547 | 7.85 | 246.5 | 3,984,673 | 15,257 | 6,102,800 |  |
| Blackbutt       | 21,708 | 7,522  | 2.886 | 1.70  | 7.42 | 220.2 | 4,780,102 | 13,728 | 5,491,200 |  |

## Appendix No. 60.

PAPERS.—CONTRACT 79.

No. 1.

The Secretary of the Sewerage Miners' Association to Thos. Houghton, Esq., M.P.

Dear Sir,

40, Charles-lane, Woolloomooloo.

Having been requested by my Association to write to the Works Department to obtain particulars whether there is any provision made for miners being provided with air, I done so through the secretary of the Trades Hall, thinking that it would have more effect, but up to the present it is nil.

Although we are a registered association, up to the present we are not recognised by the Board of Conciliation and of Arbitration, though we are looking forward to it, as in all probability we may be the first to use that Board, us being engaged on Government contracts, and our case is a calamity. I urge upon you to act on our behalf at once. *Re* this information, our general meeting is next Saturday, 30th instant.

My reason for being so urgent is this—our men are dying off so fast; I have to report another death no later than last Tuesday. We sent two to Victoria to benefit their health. I am expecting to hear of their death every day, as their case is hopeless. One of our members came to me to-day; he says, "This is terrible; I am dying—lingering in misery"; has not been able to work this six months; a walking skeleton. We have always a large percentage to support out of our pittance, which, God knows, is only an average of 5s. per day. Out of this our fellows subscribe manfully. We are sure our turn is not far off. There is no man following this work who can live long; we all feel the effects—a husky cough, and galloping consumption follows, and our end is not far off. When we apply to the hospital we are sent to Little Bay as incurable. We have to rush smoke and foul air and dust, and work in unnatural positions to obtain even that average wage. I have pay-sheets to prove my statements, and a glance at my books may prove a death-rate that would not be believed,—that is 10 per cent.—the result of us rushing this foul air and not being able to eat during working-hours. Our wives has to nurse us and bathe our aching heads at night, as we are at times almost lunatics when we ought to be resting. Our limbs weaken, and we can no longer work. We are forced to accept this death or starve our wives and children, and we do accept death to obtain them bread. There is terrible suffering amongst our members. They are willing to work, but the work is shut down from them. Although the Works Department let the contracts, they are powerless to compel them to employ labour. The North Shore underground sewerage job, Messrs. Carter & Co., has kept their shafts idle for weeks past. Men who sunk the shafts—some as deep as 250 feet odd—has been forced to fill the ranks of the unemployed. They are actually starving us into a death price. Up to the present we have never been provided with air; what air we have had we had to provide ourselves; so hoping you will take steps on our behalf,

I remain, &amp;c.,

JOS. LYNCH.

Sec., S.M.A., Sydney.

Received by me 4/8/92.—R.H., 8/8/92. Will Mr. Hudson please have this looked into at once.—J.B., 2/5/92.  
T. Houghton, M.P., 2/5/92. Mr. Davis.—F.C.P., 5/8/92.

No. 2.

Supervising-Engineer Davis to Resident-Engineer Boys.

MEMO.

WILL Mr. Boys please let me have report generally upon this letter, with the following particulars, by to-morrow morning:—

1. Description of fans, pipes, &c., used for ventilating each shaft?
2. Whether it is a fact that shafts have been standing for weeks past, and, if so, for what reason?
3. Whether the appliances are sufficient to keep the tunnel in a good state of ventilation, and, if not in any instance, what he recommends?

J.D., 5/8/92.

1. All steam-power fans at present used on 2, 3, 4, 5, 6, 7, 8 with black iron 9-inch pipes.
2. It is a fact in one instance, but that was on account of the water met with.
3. The appliances are excellent in every way, with the exception of No. 12 shaft, and I am informed that a hand-power fan is to be placed there at once by the contractor.

J.W.T.B., 5/8/92.

No. 3.

Resident-Engineer Boys to Supervising-Engineer Davis.

*Subject*:—Secretary, Sewerage Miners' Association—Want of provision for supplying miners with air, Contract 79, North Sydney, cited as an example.

Department of Public Works, Roads and Bridges and Sewerage Branch, 6 August, 1892.

THE Secretary asks whether there is any provision made for miners being provided with air.

Clause 79 of the specification, Contract 79, provides that the contractor shall provide suitable apparatus for clearing the tunnels.

The contractors have provided fans and pipes to nearly all the principal shafts on this contract, namely at 2, 3, 4, 5, 6, 7, 8. These fans are of approved make, and are driven off the winding engines at each of these shafts. The pipes are excellent, and are 9-inch diameter, and made of black iron, well tarred inside and out, preventing leakage at the joints.

I have heard no complaints on the score of bad air from any of the miners, with the exception of those at No. 12 shaft.

The following describes the means of working each shaft, and the time each was idle:—

No. 1 is at work, but was idle for a week, miners asking more pay for driving. The air is good, and no fan required, owing to there being an open end.

No. 2. Miners finished sinking shaft on 12th July. A fan and hose was put in this shaft after the first 100 feet was sunk, and this was also the case at 3, 4, 5, 6, and 7. These fans were driven off the winding engine. Since the 12th, 9-inch black iron pipes have been permanently fixed.

No. 3 was stopped for a week to enable air-pipes to be fixed permanently.

No. 4 was botomed on 8th July, and driving started 26th July. During this time air-pipes were fixed. There was a disagreement about the price of driving, and old gang refused to continue the work.

No. 5. No stoppage at this shaft beyond shifting position of shaft.

No. 6. No stoppage.

No. 7. No stoppage.

No. 8 was idle for three or four days after sinking. The fan and air-pipes and pump were fixed to this shaft after the sinking was completed. Depth of shaft, 104 feet.

No. 9. No provision made for extra air. A few days' stoppage on account of change of men.

No. 10. No provision made for extra air. There was a stoppage for a few weeks. Contractors' reasons were given that they wished 9 and 11 to be sunk the same time, so as to start the driving together.

No. 11 stopped for about four weeks—11th June to 6th July—on account of large amount of water met with. Contractors waited to see if it would take up. This shaft is now down to full depth. No provision for extra air.

No. 12. No provision made as yet for extra air. Shaft has been stopped for the last ten days. The men complain of bad air and the smoke hanging for a long time. This is the only case of bad air, and I am informed that the contractors are about to put a hand-fan at this shaft, which is 95 feet deep, and the drive is 44 feet in.

The appliances on the work are in good order, and quite sufficient wherever steam-power is used, namely, at shafts 2, 3, 4, 5, 6, 7, 8.

It will soon be necessary to have air driven into 9 and 10.

Nos. 9, 10, and 11 are shallow shafts, and the drives between them are not long. Hand-power fans will be sufficient for these shafts, but are not necessary just yet.

No. 12 shaft should be supplied with a fan at once.

J. W. T. BOYS, 6/8/92.

## No. 4.

Resident-Engineer Rudolph to Supervising-Engineer Davis.

*Subject* :—Want of provision for supplying miners with air.Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 8 August, 1892.

Re the provision of supplying miners with air on Contract No. 80, I have to report that nothing has been done yet. I spoke both to Mr. Farley and his foreman about this subject repeatedly, and was assured on one occasion that windsails had been ordered, and on another occasion I heard Mr. Farley give instructions to find out if Carter & Co. had any blowers for sale suitable for his work, but up to the present nothing but the bends for down-pipes are on the ground. Our drives, in most instances, have not been too far away from the face of the shafts, but now there is no doubt but it becomes a necessity to have ventilation provided at every shaft, and it will be still more wanted if the weather should get warmer. I therefore beg leave to recommend that the contractor be instructed to provide such means as are wanted to send fresh air into the drives, and that his attention may be specially called upon to have the air blown right into the faces where men are employed in gadding out the work, to help as much as possible for the quick setting down of the stone-dust in these places.

H. RUDOLPH,  
Resident Engineer.

## No. 5.

Supervising-Engineer Davis to the Engineer-in-Chief for Sewerage.

*Minute Paper.**Subject* :—North Shore and Darling Point Sewers—Ventilation of Tunnels.Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 8 August, 1892.

THE only tunnelling which is at present being done in this branch is at North Sydney and Darling Point, and as the Secretary of the Sydney Miners' Association makes general statements with reference to the lack of fresh air supplied to miners, I have obtained reports from the resident engineers who are in charge of these two sewers, which I enclose.

There are twelve shafts on the North Sydney works, and of these seven are provided with blowers driven by steam-power, three do not require artificial ventilation at present, and at the remaining two fans are necessary at once. Where the ventilation is done by steam-power, it is all that can be desired, and the contractors, I understand, are making arrangements to supply the two shafts with the fans necessary.

Mr. Lynch states what is certainly not a fact when he says that shafts at North Sydney have been idle for weeks past on account of a lack of adequate ventilation. Messrs. Carter & Co. have made excellent progress with their work, and, with the exception of one shaft (which was not standing for bad ventilation), the rate of progress has been far more than provided by the contract.

At Darling Point the shafts are shallow, and there is not, therefore, the same necessity as at North Sydney for steam-power for driving the fans. Hand-fans will meet all the requirements, and now that the tunnels are being driven, the contractors have been requested to provide means of artificial ventilation, which they have promised to do.

Miners' work is clearly an unhealthy occupation, and no doubt they must feel the effects of the class of work they do. I do not think, however, that more can be done at North Sydney, except in the case of the two shafts referred to above. At Darling Point hand-fans or some such contrivance must be adopted for forcing the air into the tunnels.

There is a clause in each of these tunnel contracts binding the contractors to provide "blowing machine with ventilating fans \* \* \* capable \* \* \* of removing the foul air in one minute after blasting at each working-face."

J. DAVIS.

Mr. Houghton might be sent a copy of these reports, and informed that the department will exercise its full powers as regards compelling all our contractors to provide suitable ventilating appliances.—R.H., 8/8/92. Under Secretary. Write.—J.B., 8/8/92. T. J. Houghton, Esq., M.P., 12/8/92. Seen.—R.H., 15/8/92. Mr. Davis to note.—F.C.P., 15/8/92. Noted.—J.D., 15/8/92.

## No. 6.

Resident-Engineer Boys to Messrs. Carter &amp; Co.

Dear Sirs, North Shore, 12 August, 1892.

Will you kindly inform me why there is no one working at the shafts and drives to-day?

Yours, &c.,  
J. W. T. BOYS.

In the absence of the contractors I cannot say further than that I think the men demand more money.—Jno. R. RAID.

## No. 7.

Inspector J. Parsons to The Resident Engineer.

INSPECTOR'S DAILY REPORT OF CONTRACT NO. 79.

North Shore, 12 August, 1892.

WORKMEN employed by Contractor—

|   |   |
|---|---|
| Labourers .....                               | 2 |
| Carpenters .....                              | 2 |
| Masons and other mechanics, blacksmiths ..... | 2 |

*Remarks.*—No work going on here to-day. The men all came out on strike this morning. The reason is they want more money, not being able to make wages at what they have been getting.

JOHN PARSONS,  
Inspector.

It appears from these reports that the miners employed on the North Shore Outfall Sewer are out on strike for an increase of wages.—J.D., 13/8/92. Engineer-in-Chief. Seen.—R.H., 15/8/92. Mr. Davis.—F.C.P., 15/8/92. Mr. Boys may require these reports for posting journal.—J.D., 15/8/92. Mr. Boys. Report finished with.—J.W.T.B., 18/8/92.

## No. 8.

The Secretary, Trades and Labour Council, to The Secretary for Public Works.

Sir, Trades Hall, Goulburn and Dixon Streets, Sydney, 19 August, 1892.

I have been instructed, by resolution of the above Council, to write and ascertain if you will be pleased to appoint a date, time, and place for the reception of a deputation relative to certain matters of a vexed nature at present existing between the contractor for and the miners employed on the sewerage works at North Shore.

I should take it as a great favour if you would kindly afford me a day or two prior notice of the date appointed for deputation's reception.

I remain, &c.,  
JOHN RIDDELL,  
Secretary.

The deputation waited on the Minister yesterday. Resubmit, with the notes of the interview.—J.B., 30/8/92.

## No. 9.

## No. 9.

## Minute by the Under Secretary for Public Works.

Department of Public Works, Sydney, 23 August, 1892.

PLEASE get me the papers at once respecting the application of Mr. Riddell for a deputation respecting a grievance of the miners employed on the North Shore Sewerage Works. J.B.

Attach papers.—F.C.P., 24/8/92. No papers registered here. Mr. Riddell's application has not yet been received.—E.H. Mr. Piper,—Paper now attached.—F.C.P., 24/8/92. Papers herewith.—R.H., 25/8/92.

## No. 10.

## Resident-Inspector Boys to Supervising-Engineer Davis.

Sir, Public Works Department, Sewerage Branch, Lincoln's Inn Chambers, and 40, Elizabeth-street, Sydney, 7 September, 1892.

I beg to inform you that the Contract 79, Messrs. Carter & Co., is being proceeded with. The men started yesterday afternoon, the 6th instant. Yours, &c.,

J. W. T. BOYS.

For the information of the Engineer-in-Chief.—J.D., 7/9/92. Seen.—R.H., 8/9/92.

## No. 11.

## T. J. Houghton, Esq., M.P., to The Under Secretary for Public Works.

Dear Mr. Barling, Parliament House, Sydney, 28 September, 1892.

I enclose a letter I have just received from the Secretary of the Sewerage Employees' Union, and would feel obliged if you would kindly have the matter attended to at once, and let me know the result.

Yours, &amp;c.,

T. J. HOUGHTON.

Mr. Hickson.—J.B.; B.C., 29/9/92. Urgent. For report.—R.H., 31/9/92. Mr. Davis. Report herewith.—J.W.T.B., 4/10/92.

[Enclosure.]

Sir,

Sydney, 27 September, 1892.

I am directed by our Association to once more trouble you to visit the Works Department *re* the ventilation of No. 10 shaft on Carter & Co.'s sewerage contract, North Shore.

There is a hand-fan erected on the shaft, and pipes are connected to the bottom of the shaft only, and the drives are in from 60 to 80 feet.

The contractor refuses to connect any pipes into the drives where the men are at work; also refuses to put labour on to pump the supply of air. Therefore our men are working under deplorable conditions, and the inspectors insist that they cannot act on our behalf. Hoping you will see to this.

I remain, &amp;c.,

JAS. LYNCH, Secretary,

Sewerage Miners' Association.

T. J. Houghton, Esq., M.P.

## No. 12.

## Resident-Engineer Boys to Supervising-Engineer Davis.

*Minute Paper.*

*Subject*.—Complaints *re* ventilation of Shaft No. 10, Contract 79. [See letter 92-2,160, 30th September.]

Department of Public Works, Roads and Bridges and Sewerage Branch, North Sydney, 4 October, 1892.

THERE is a hand-power fan and pipes in this shaft, and the pipes are within 30 feet of the face in the north drive. This is as near to the face as practicable.

In the south drive the pipes are in 16 ft. 6 in., and there are plenty of pipes ready at the shaft to be joined in when required.

The contractors state that, by their arrangement with the men, the contractors supply pipes and put them in to the bottom of the shaft and fix a T piece on, and that the men are supplied with pipes.

The men fix the pipes in the drives and supply the labour for driving in the air as required.

The inspector reports to me and to the contractors whenever the men require anything, or have any complaints to make, and the men themselves have never made any formal complaint to me.

The inspector states that it is necessary to blow the fan continually now to keep the drives fresh, but at present the men only blow out the smoke after firing.

J. W. T. BOYS.

## No. 13.

## Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.

*Minute Paper.*

*Subject*.—Contract No. 79, North Shore Outfall—*Re* ventilation of Shaft No. 10.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 4 October, 1892.

I HAVE seen the contractors with reference to Mr. Lynch's complaint, and I have also obtained a report from Mr. Boys, which I enclose. It appears that the miners, by arrangement, have undertaken to fix the air-pipes in the drives, and that, therefore, if there was delay in these pipes being put in position, it was due to the miners themselves. Since Mr. Lynch wrote his letter, they have fixed the pipes from the shaft to within about 30 feet of the face of north drive, and within about 50 feet of the face of south drive, and pipes are available, so that this last drive can be ventilated in the same way as the north drive. If the pipes are carried within 30 feet of the face, it is as near as they should be, as they would be damaged by the blasting if taken nearer.

The contractors state that the price paid for excavating the tunnel was to include the cost of turning the hand-fan. At present it is only being turned immediately after a shot is fired, but this is not sufficient. Arrangements should be made for the fan to be kept in motion the whole time miners are engaged in the tunnels.

I would suggest that the contractors be written to in terms of the draft letter attached.

J. DAVIS.

See letter written to contractors. It appears, however, that it is really the miners' own fault that sufficient air is not supplied.—R.H., 5/10/92. Under Secretary. Inform.—J.B., 5/10/92. T. J. Houghton, Esq., M.P., 10/10/92.

## No. 14.

## The Engineer-in-Chief for Sewerage to Messrs. Carter &amp; Co.

Gentlemen,

4 October, 1892.

It is reported to me by the resident engineer that the ventilation at shaft No. 10 is not at all satisfactory. The air-pipes are only fixed a short distance from the shaft in the tunnel which is being driven in a southerly direction, and there is about 45 feet of the drive without pipes, and that the hand-fan is only being turned immediately after shots are fired, instead of being kept constantly going. I have, therefore, to draw your particular attention to clause 79 of the specification, and to request that immediate steps be taken to lay additional air-pipes, and also that the fan be kept in motion the whole time miners are engaged in the tunnel.

I have, &amp;c.,

ROBT. HICKSON,

Engineer-in-Chief for Sewerage.



**Appendix No. 61.**

PAPERS—CONTRACT 69.

No. 1.

Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.

Minute Paper.

Department of Public Works, Roads and Bridges and Sewerage Branch.

Sydney, 18 January, 1894.

*Subject* :—Contract No. 69. Eastern Branch, Western Suburbs, cross-sections of sewer to be adopted.

PROVISION has been made in this contract for constructing the sewers and shafts wholly in concrete, or in brick and concrete. With a view of ascertaining which would be the cheaper method to adopt, I have had comparative estimates prepared at the contract schedule rates, which I attach.

I beg to recommend that the following sections for sewers be adopted :—

- (a) For open cutting—No. 2 cross-section.
- (b) For tunnels where timber is required—No. 3 cross-section.
- (c) For tunnels in soft ground where timbering is not required—No. 5 cross-section.
- (d) For tunnels in hard ground—No. 6 cross-section.

It will be seen that the cheaper shafts are those built with brick, and I recommend that this description of shaft be adopted.

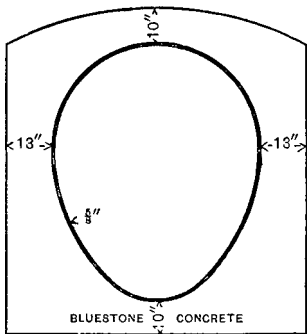
Approved.—R.R.P.H., 19/1/94. Messrs. Carter, Gummow, & Co., 20/1/94. Mr. Millner to note.—J.D., 20/1/94. Noted.—W.J.M., 24/1/94. File.—J.D., 1/2/94. The Engineer-in-Chief has decided that in the case of Sydenham-road sewer, in open cutting, the No. 3 section, may be adopted instead of No. 2, on the understanding that the No. 2 is put in other open cuttings, and that in the case of Sydenham-road specially selected material be put in the sides and round the arch up to the level of crown.—J.D., 9/3/94. Mr. Millner. Noted.—W.J.M., 9/3/94. File.—J.D., 13/3/94.

J. DAVIS.

COMPARATIVE estimate for constructing sewers and shafts wholly in concrete or in brick and concrete.

*Shafts.*

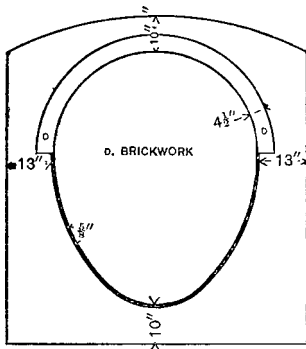
|  |            |
|--|------------|
| Cost of (9-inch) brick shaft per 100 lineal feet ..... | £78 14 7   |
| Cost of { Concrete, 9-inch, do .....                   | £65 17 1 } |
| { Cement facing, 5/8-inch, do .....                    | 21 15 0 }  |
| 5' 1" x 4' 1" .....                                    |            |



*Sewers.*

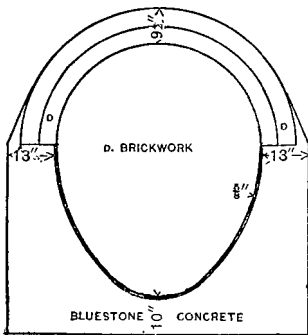
(1.) In open cutting.

|  | £           | s.       | d.           |
|--|-------------|----------|--------------|
| 58.96 cubic yards per chain at 43/- .....  | 126         | 15       | 3 concrete.  |
| 105.60 square yards per chain at 5/- ..... | 26          | 8        | 0 rendering. |
| Cost per chain .....                       | <u>£153</u> | <u>3</u> | <u>3</u>     |



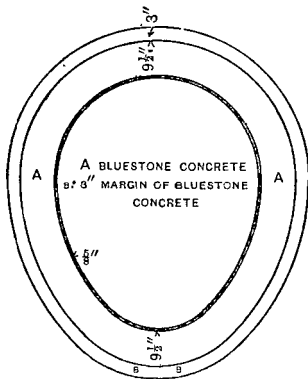
(2.) In open cutting.

|   | £           | s.        | d.           |
|---|-------------|-----------|--------------|
| 52.28 cubic yards per chain at 43/- ..... | 112         | 8         | 1 concrete.  |
| 6.42 " " " 55/- .....                     | 17          | 13        | 1 brickwork. |
| 58.60 square yards " " 5/- .....          | 14          | 13        | 0 rendering. |
| Cost per chain .....                      | <u>£144</u> | <u>14</u> | <u>2</u>     |



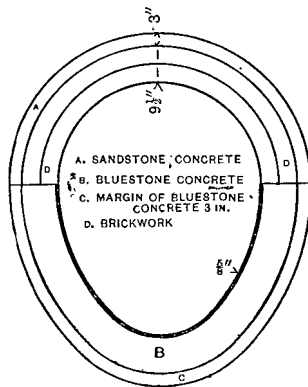
(3.) In tunnel where timbering is required.

|   | £           | s.       | d.           |
|---|-------------|----------|--------------|
| 36.18 cubic yards per chain at 43/- ..... | 77          | 15       | 9 concrete.  |
| 14.81 " " " 55/- .....                    | 40          | 14       | 7 brickwork. |
| 58.60 square yards " " 5/- .....          | 14          | 13       | 0 rendering. |
| Cost per chain .....                      | <u>£133</u> | <u>3</u> | <u>4</u>     |



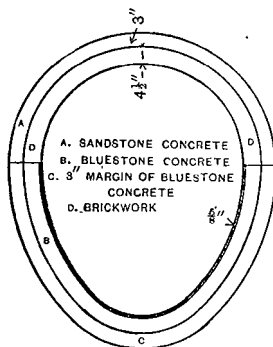
(4.) In tunnel, soft ground.

|                                     | £   | s. | d. |
|-------------------------------------|-----|----|----|
| 43.14 cubic yards per chain at 43/- | 92  | 15 | 0  |
| 105.60 square yards ,, 5/-          | 26  | 8  | 0  |
| Cost per chain.....                 | 119 | 3  | 0  |



(5.) In tunnel, soft ground.

|                                     | £   | s. | d. |
|-------------------------------------|-----|----|----|
| 23.48 cubic yards per chain at 43/- | 50  | 9  | 7  |
| 5.67 ,, ,, 40/-                     | 11  | 6  | 10 |
| 14.81 ,, ,, 55/-                    | 40  | 14 | 7  |
| 58.60 square yards ,, 5/-           | 14  | 13 | 0  |
| Cost per chain .....                | 117 | 4  | 0  |



(6.) In tunnel, hard ground.

|                                     | £  | s. | d. |
|-------------------------------------|----|----|----|
| 12.67 cubic yards per chain at 43/- | 27 | 4  | 10 |
| 4.88 ,, ,, 40/-                     | 9  | 15 | 2  |
| 6.42 ,, ,, 55/-                     | 17 | 13 | 1  |
| 58.60 square yards ,, 5/-           | 14 | 13 | 0  |
| Cost per chain .....                | 69 | 6  | 1  |

J.D., 19/1/94.

No. 2.

Supervising-Engineer Davis to Messrs. Carter, Gummow, & Co.

Gentlemen,

Department of Public Works, Sydney, 20 January, 1894.

I have the honor to enclose, for your information, a tracing showing the different cross-sections of sewer-lining which the Engineer-in-Chief has decided to adopt on your Sewerage Contract No. 69.

With regard to cross-sections Nos. 5 and 6, you will receive instructions as the work proceeds which of these sections will be used.

The shafts will be built of bricks where such are shown on contract drawings.

I have, &c.,

J. DAVIS,  
Supervising Engineer for Sewerage.

(Through Mr. Millner.)

No. 3.

Supervising-Engineer Davis to Messrs. Carter, Gummow, & Co.

Gentlemen,

Department of Public Works, Sydney, 18 January, 1894.

I beg herewith to enclose a list of the sizes of shaft excavation. The sizes are to the inside of the timber, and do not include the extra excavation required for the chambers, down-pipes, &c. This additional excavation may either be done at the time you are sinking the shafts, or afterwards, as it suits your convenience. Where sumps are required they are to be sunk the size of the shafts. Mr. Millner will decide at the time a shaft is excavated whether a sump will be necessary, and give you instructions accordingly.

With reference to the excavation in tunnels in "more or less hard material," which in the opinion of the engineer requires blasting, I have to inform you that any ground of this description in the lower part of the tunnels where timbering is used in the upper part, must be taken out for two-ring lining without the use of blasting, by means of guttering and gadding, and will be paid for under schedule item No. 6.

With regard to other lengths of the tunnels requiring blasting, special instructions will be issued for each length.

As to tunnels in "more or less hard material" which require timbering, I have to request that you will excavate the same to the cross-sections shown in the margin.

The tunnels in "solid rock" are to be excavated for one-ring lining by means of 4-inch charges of compressed powder.

I have, &c.,  
J. DAVIS,  
Supervising Engineer for Sewerage.

List

List of Shafts on Contract No. 69.

| Shafts, &c        | Position                          | Chainage at centre of Manholes | Size of Shafts                          |
|-------------------|-----------------------------------|--------------------------------|---|
| Penstock chamber  | Premier street                    | m c l<br>2 16 87 57            | Enlarged, as shown on contract drawings |
| Ventilating shaft | Illawarra road, Canterbury Branch | 2 24 87 33                     | 6' x 5'                                 |
| "                 | Carey street, Northern Branch     | 2 23 90                        | 6' x 5'                                 |
| " pipe shaft      | " "                               | 2 23 80                        | 6' x 5'                                 |
| " shaft           | Renwick street, Eastern Branch    | 2 28 0                         | 6' x 5'                                 |
| "                 | " Suburban Main                   | 2 34 0                         | 6' x 5'                                 |
| "                 | " "                               | 2 38 60                        | Opening cutting.                        |
| "                 | " "                               | 2 41 45 8                      | "                                       |
| " pipe shaft      | Warren road                       | 2 33 5                         | 6' x 5'                                 |
| " shaft           | Grove road                        | 2 40 50                        | 6' x 5'                                 |
| "                 | Illawarra road                    | 2 43 83 47                     | Not to be sunk.                         |
| "                 | "                                 | 2 53 0                         | Opening cutting.                        |
| "                 | Petersham and Illawarra Roads     | 2 57 64 05                     | "                                       |
| " pipe shaft      | Illawarra road                    | 2 61 70                        | "                                       |
| " shaft           | Calvert street and Illawarra road | 2 65 80 68                     | "                                       |
| " pipe shaft      | Illawarra road                    | 2 69 70                        | 6' x 5'                                 |
| " shaft           | Manickville and Illawarra Roads   | 2 73 86 3                      | 6' x 5'                                 |
| " pipe shaft      | Illawarra road                    | 2 78 0                         | 6' x 5'                                 |
| " shaft           | "                                 | 2 2 30                         | Opening cutting                         |
| "                 | "                                 | 3 13 57 71                     | "                                       |
| "                 | Sydenham road                     | "                              | "                                       |
| "                 | Silver street and Sydenham road   | 3 17 74 69                     | "                                       |
| "                 | Albert street and Sydenham road   | 3 24 6 59                      | "                                       |
| "                 | Illawarra road                    | 3 20 40                        | "                                       |
| "                 | Council and Illawarra road        | 3 23 90                        | 6' x 5'                                 |
| "                 | Woodland and Illawarra road       | 3 30 28 13                     | 6' x 5'                                 |
| " pipe shaft      | Illawarra road                    | 3 33 85                        | 6' x 5'                                 |
| " shaft           | Charles street and Illawarra road | 3 37 53                        | Opening cutting                         |
| "                 | Agai street                       | 3 52 20                        | "                                       |
| " pipe shaft      | "                                 | 3 57 0                         | 6' x 5'                                 |
| " shaft           | Agai and Emily Streets            | 3 62 54 20                     | 7' x 6'                                 |
| "                 | Emily street                      | 3 69 0                         | 6' x 5'                                 |

## No. 4.

Supervising-Engineer Davis to Messrs. Carter, Gummow, &amp; Co.

Gentlemen, Department of Public Works, Sydney, 19 January, 1894.  
I have the honor to inform you that you are at liberty for the present to dispose of the surplus material as you find it convenient, and that you will be paid for same under schedule item No 43

(Through Mr Millner )

I have, &c,  
J. DAVIS,  
Supervising Engineer for Sewerage.

## No 5.

Supervising-Engineer Davis to Messrs Carter, Gummow, &amp; Co

Gentlemen, Department of Public Works, Sydney, 24 January, 1894.  
Referring to clause 6 of the specification, I have the honor to inform you that you may excavate shafts No 4 at 2 m 33 chs 5 lks from 9 feet below the surface, No 5 at 2 m 40 chs 50 lks from 6 feet below the surface, and No 14 at 3 m 69 chs from 18 feet below the surface, with the use of 4 inch charges of compressed powder

(Through Mr Millner )

I have, &c,  
J. DAVIS,  
Supervising Engineer for Sewerage

## No 6

Supervising-Engineer Davis to Messrs. Carter, Gummow, &amp; Co

Gentlemen, Department of Public Works, Sydney, 3 February, 1894.  
Referring to clause 6 of the specification, I have the honor to inform you that you may excavate shafts No. 2A at 3 m. 27 chs 90 lks from 3 feet below the surface, No 3 at 2 m 38 chs from 7 feet below the surface, No 3A at 2 m 34 chs from 3 feet below the surface, No 11 at 3 m 33 chs 85 lks from 27 feet below the surface, and No. 10 at 3 m. 30 chs. 28 13 lks from 26 feet below the surface, with the use of 4 inch charges of compressed powder

(Through Mr Millner )

I have, &c.,  
J. DAVIS,  
Supervising Engineer for Sewerage.

## No 7

Supervising-Engineer Davis to Messrs Carter, Gummow, &amp; Co.

Gentlemen, Public Works Department, Sewerage Branch, 19 February, 1894  
Referring to clause 6 of the specification, I have the honor to inform you that you may excavate shafts No. 2 at 2 m 22 chs 80 lks from 10 feet below the surface, and No 6 at 2 m 69 chs 70 lks from 18 feet below the surface, with the use of 4-inch charges of compressed powder

(Through Mr Millner )

I have, &c.,  
J. DAVIS,  
Supervising Engineer for Sewerage.

No. 8.

No. 8.

Supervising-Engineer Davis to Messrs. Carter, Gummow, &amp; Co.

Gentlemen,

Public Works Department, Sewerage Branch, 12 March, 1894.

I have the honor to forward herewith an additional drawing, showing slight modification in the details of shafts at 2 m. 73 chs. 863 lks. and Emily-street, and the upper portion of the pipe-shafts. You will notice that the cast-iron plates shown on the drawing attached to the contract, on the ledges at the bottom of the shafts, are substituted for boards, that the sandstone ashlar at the top of the shafts is substituted for concrete, and that the top of the pipe-shafts is altered. Will you please bear in mind that these alterations apply to the whole of the shafts in your contract.

I have, &amp;c.,

J. DAVIS,

Supervising Engineer for Sewerage.

(Through Mr. Millner.)

No. 9.

Supervising-Engineer Davis to Inspector Millner.

*Minute Paper.*

Department of Public Works, Roads and Bridges and Sewerage Branch,

Sydney, 2 May, 1894.

*Subject:—Contract No. 69.—Substituting Tunnelling for open Cutting.*

I UNDERSTAND that the contractors wish to substitute tunnelling for open cutting in two or three instances. They must write, asking permission to do this, before any excavation is paid for in such cases, as it will be necessary to clearly understand on what conditions the concession is granted. Will you please see contractors with reference to this matter.

J.D.

I have seen contractors and verbally informed them of this.—W.J.M., 14/5/94. Mr. Davis. This might now be filed.—J.D., 22/5/94.

No. 10.

Supervising-Engineer Davis to Messrs. Carter, Gummow, &amp; Co.

Gentlemen,

Department of Public Works, Sewerage Branch, 23 June, 1894.

I understand it is your intention to substitute tunnelling for open cutting in the Illawarra Road for a portion or the whole of the length between 2 m. 54 chs. and 2 m. 87 chs., and I desire to inform you that there will be no objection to this course, but it must be distinctly understood that you will be paid as though the excavation had been done in the manner shown on the drawings attached to the contract.

I have, &amp;c.,

J. DAVIS,

Supervising Engineer for Sewerage.

No. 11.

Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.

*Minute Paper.*

Department of Public Works, Roads and Bridges and Sewerage Branch,

Sydney, 9 May, 1894.

*Subject:—Contract No. 69, Eastern Branch, Western Suburbs.—Pitching round Manhole Covers.*

As some of the manholes on this contract are being constructed, I should like the Engineer-in-Chief's decision as to the kind of pitching, if any, which is to be put round the manhole covers.

Twelve square yards of squared bluestone pitching were included in the schedule of quantities, which the contractors have priced at £50 per square yard. The quantity likely to be used, if the whole of the manholes are to be pitched, will be 35 square yards, which, at schedule rates, will amount to £1,750.

Special bluestone concrete will answer the same purpose as bluestone pitchers, and will only cost 9 cubic yards, at 50s. = £22 10s.

The fair price for bluestone pitching is about 25s. per square yard, and, as the schedule rate is so much higher than the market rate, the question arises whether the pitching should not be omitted. If, however, this course is considered to be unfair to the contractors, then only the quantity included in the schedule of quantities need be carried out.

J.D.

We cannot in fairness omit an item for which, no doubt, the price is absurdly high, while we know that on other items the price is equally low. Where bluestone pitchers are shown on drawing contractors must be paid for same at schedule rates.—R.R.P.H., 11/5/94.

Mr. Millner to note.—J.D., 11/5/94. Noted.—W.J.M., 14/5/94. Mr. Davis. File.—J.D., 15/5/94.

No. 12.

Inspector Millner to Supervising-Engineer Davis.

Sewerage Office, Arncliffe, 21 August, 1894.

Contract 69, *re* extra lining of Tunnel, between 2 miles 38 chains and 2 miles 45 chains.

I THINK that it will be advisable that the extra lining of tunnel (ordered between 2 miles 40½ chains and 2 miles 45 chains) should start at 2 miles 38 chains. The ground in this extra 2½ chains is of a very similar nature to the other.

Register.—J.D., 23/8/94.

Will Mr. Piper please attach the paper referred to?—J.D., 25/8/94. W. J. MILLNER.

Has Mr. Millner these papers?—J.D., 28/8/94. Previous papers, 94-1,078, Mr. Davis, 25/6/94. I have not got these papers.—W.J.M., 29/8/94. Mr. Davis. What will the extra cost be?—J.D., 31/8/94. Mr. Adams. The extra cost from 2 miles 38 chains to shaft at 2 m. 40 chs. 50 lks. will be £206 3s. 9d.—W.E.A., 31/8/94.

Will the Engineer-in-Chief please approve of 10 inches of lining for this length of tunnel? It was driven for 5 inches in the first instance. The ground has proved to be of a soft nature, and therefore requiring an extra thickness of lining. This additional work is fully provided for in the contract, and included in schedule of quantities.—J.D., 31/8/94. Engineer-in-Chief.

Approved.—R.R.P.H., 1/9/94.

Contractors informed.

Mr. Millner to note.—J.D., 7/9/94.

Noted.—

W.J.M., 11/9/94. File.—J.D., 17/9/94.

No. 13.

Supervising-Engineer Davis to Messrs. Carter, Gummow, &amp; Co.

Gentlemen,

Public Works Department, Sewerage Branch, 28 June, 1894.

I have to request that you will please excavate the tunnel between 2 miles 40½ chains and 2 miles 45 chains, to admit of two-ring lining being put in. The excavation you will be paid for under item No. 9, and the bluestone concrete and additional brickwork under items Nos. 32 and 33 respectively.

I have, &amp;c.,

J. DAVIS,

Supervising Engineer for Sewerage.

No. 14.

## No. 14.

Messrs. Carter, Gummow, &amp; Co. to The Under Secretary for Public Works.

Sir,

North Sydney, 6 July, 1894.  
 With reference to our Contract No. 69, Sydney Sewerage, we are willing that the Government shall exercise the option of paying us all sums now due or to accrue due in respect of this contract, either in cash or Funded Stock, as may be thought fit.

We have, &amp;c.,

JOHN CARTER.  
 FRANK MOORHOUSE GUMMOW  
 (By his Attorney, JOHN CARTER).  
 D. G. SNODGRASS.  
 GEORGE MADDISON.  
 PETER EWING.

Witness,—ROBERT MILLER, J.P.

We, the sureties named in the bond in connection with the above contract, consent hereto.

Witness,—FRED. WOOLCOTT-WALEY, J.P.

CHAS. J. HENTY.  
 R. L. SCRUTTON.

Treasury informed, 9/7/94. For approval.—J.B., 10/7/94. Approved.—W.J.L. Accountant, Roads, to  
 note.—F.C.P., 24/7/94. Seen;—Mr. H. to note.—O.C., 24/7/94. Mr. Wallwork,—Please place with Bond Ct.  
 69.—E.H., 24/7/94.

## No. 15.

The Council Clerk, Marrickville, to The Commissioner for Roads.

Sir,

Borough of Marrickville, Town Hall, 24 August, 1894.  
 I am directed by his Worship the Mayor to draw your attention to the enclosed letter, received by him from the borough engineer, and to request that the department will cause such steps to be taken in this matter as may be deemed necessary, so as to avert what would be an intolerable and continuous nuisance.

I have, &amp;c.,

HENRY H. BROWN,  
 Council Clerk.

For report.—R.R.P.H., 27/8/94. Report herewith.—J.D., 6/9/94. Council Clerk.—J.D., 13/9/94.

Sir,

I have the honor to bring before your notice the following:—The Government Sewerage Department is taking up a culvert on the Illawarra Road, near Addison Road, and intend substituting one that will act as a siphon. It is needless for me to point out the nuisance and trouble this will be to the Council. But I wish to bring under your notice the fact that it is quite unnecessary to have a siphon. Below the culvert there is a fall of 4 ft. 6 in. in 7½ chains, which if worked out would give sufficient fall for the drain, and clear the culvert altogether. As it is a matter of great importance, I have brought it before your notice without loss of time.

I am, &amp;c.,

J. P. WEBSTER.

## No. 16.

Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.

*Minute Paper.*

Department of Public Works, Roads and Bridges and Sewerage Branch,  
 Sydney, 6 September, 1894.

*Subject*:—Contract No. 69, Eastern Branch Sewer, Western Suburbs, Culvert under Sewer near Addison Road.  
 THIS culvert is shown on the contract drawings to be built as a siphon under the Eastern Branch Sewer. Siphons are always objectionable, and should, if possible, be avoided, especially where, as in this case, there will be large quantities of heavy silt carried with the water, which will undoubtedly settle in it.

With a view of finding out whether the siphon in this instance could be dispensed with, I have had levels taken of the stream below the culvert, and I find that by lowering the bed of the creek for a length of 287 feet, and carrying the culvert 75 feet to the east of the Illawarra Road, to support a cottage which is built on the edge of the creek, the siphon need not be constructed.

The cost of lowering the creek and extending the culvert will be about £125, and I would strongly recommend that this extra be incurred.

Longitudinal section of creek and drawing of proposed culvert submitted with this report. Approved.—R.R.P.H., 6/9/94. Mr. Davis. Contractors informed.—J.D., 13/9/94. Mr. Millner to see. Seen.—W.J.M., 14/9/94. File.—J.D., 17/9/94. J.D.

## No. 17.

Supervising-Engineer Davis to Messrs. Carter, Gummow, &amp; Co.

Gentlemen,

Public Works Department, Sewerage Branch, 12 September, 1894.

Referring to your Contract No. 69, I have to honor to inform you that the Engineer-in-Chief has decided to dispense with the siphon culvert under the sewer near Addison Road, and to substitute a culvert, as shown on the sketch handed to you by Mr. Millner. Will you please also extend the culvert as shown to support the cottage built on the edge of the creek, and deepen the creek to give an outlet for the culvert.

You will be paid at schedule rates for this work.

I have, &amp;c.,

J. DAVIS,  
 Supervising Engineer for Sewerage.

## No. 18.

Messrs. Carter, Gummow, &amp; Co. to The Engineer-in-Chief for Sewerage.

Contract No. 69, Western Suburbs Sewerage.

Sir,

North Sydney, 20 September, 1894.  
 Having now completed a considerable portion of the above contract, for the performance of which your department hold security to the extent of about £6,800, being £4,500 as guaranteed by our sureties and £2,300 retention money for work already done, we have the honor to ask you to allow the payment to us of £1,000 from the latter amount, leaving £5,800 still remaining as security for the due fulfilment of the remaining portion of the work.

We would remind you that our sureties are two of the most reliable firms in the city, viz., Parbury, Henty, & Co., Pitt-street, and R. L. Scrutton & Co., Clarence-street; and also that the amount of security required had the contract been accepted in the ordinary way would not have exceeded £4,500.

We have, &amp;c.,

CARTER, GUMMOW, &amp; CO.

Personal security has been given on this contract for double the usual amount of cash security; so that, in addition to the retention money, which amounts to nearly £2,300, the department has security for £4,520, making a total of personal and cash security for the due performance of the contract of £6,820. The amount of the contract is £45,207, of which there has been about £30,000 worth of work done. This being the case, and the personal security being Messrs. Henty & Co. and Mr. R. L. Scrutton (firms, I suppose, which are safe), I think £1,000 of the retention money might be returned.—J.D., 21/9/94. Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage.

Recommended.—R.H., 21/9/94. Under Secretary. For approval.—J.B., 21/9/94. Approved.—J.H.Y., 21/9/94. Mr. Millner to include in next progress return.—J.D., 21/9/94. Included.—W.J.M., 24/9/94. Accountant.—J.D., 26/9/94. Voted.—O.C. (*per E.H.*), 2/10/94. Mr. Piper.

No. 19.  
 Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.  
 Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 21 September, 1894.

Minute Paper.

Subject:—Western Branch, Western Suburbs, recommending that a single sewer be substituted for the two sewers originally proposed.

In the original scheme for the drainage of the western suburbs two sewers are provided to run side by side from Premier-street to a point in the Terrace Road where the Canterbury sewer branches off to that suburb, a length of 70 chains. Over twelve months ago the survey was completed for the two sewers, and in anticipation of them being continued the length of tunnelling and lining from Premier-street to the Illawarra Road was included in the contract for the eastern branch. The tunnel is now driven for the two sewers for this length, and the lining will be proceeded with in a few days.

With a view of seeing how the cost of a single sewer would compare with that of a double one, estimates have been prepared which I attach. They show that the double sewer—

|   |         |    |    |
|---|---------|----|----|
| For the length from Premier-street to Terrace Road, exclusive of shafts and aqueduct, to be ..... | £       | s. | d. |
| And the single sewer, 7 ft. 8 in. x 6 ft. 8 in., to be, on same basis .....                       | 22,867  | 3  | 9  |
|   | 13,758  | 13 | 9  |
| <hr/>   |         |    |    |
| Saving in favour of one sewer .....   | 8,108   | 10 | 0  |
| To this must be added saving in shafts .....  | 1,000   | 0  | 0  |
| And saving in cost of aqueduct .....  | 1,500   | 0  | 0  |
| <hr/>   |         |    |    |
| Total saving in favour of one sewer .....   | £10,608 | 10 | 0  |

The only objection to the single sewer is in the fact that the flow line will be raised 5½ inches, and this will affect the area drained by the Canterbury branch to that extent.

I have consulted with Mr. Bagge as to the desirability of making the proposed change, and he quite agrees with me that it should be made.

I beg, therefore, on the score of economy, that the single sewer should be substituted for the double sewer.

I have seen Messrs. Carter & Co. with reference to making the change in the length between Premier-street and Illawarra Road, and they are willing to build the single in place of the double sewer, provided they are recouped for any expense they may have gone to in making centering for this particular length. If the Engineer-in-Chief so decides, the two sewers could be built, and a chamber and shaft built at Illawarra Road to connect the single and double sewer, as shown on attached tracing.

J. DAVIS.

One sewer from Premier-street approved.—R.H., 24/9/94. Will Mr. Millner please note and report what expense the contractors have been put to in preparing centering. I will then write contractors, instructing them to carry out the single sewer in lieu of double one.—J.D., 24/9/94. Mr. Millner. Noted and report herewith.—W.J.M., 29/9/94. Contractors informed.—J.D., 11/10/94. Will Mr. Bagge please have drawings prepared for Illawarra Road shaft, providing for inlet from east, and also of any alteration he wishes made in invert of Premier-street chamber.—J.D., 11/10/94. Mr. Bagge. Mr. Baltzer for details.—C.H.O.-B., 11/10/94. Details are nearly finished.—C.H.O.-B., 15/10/94.

Resident Engineer's Office, Arncliffe, 9 October, 1893.

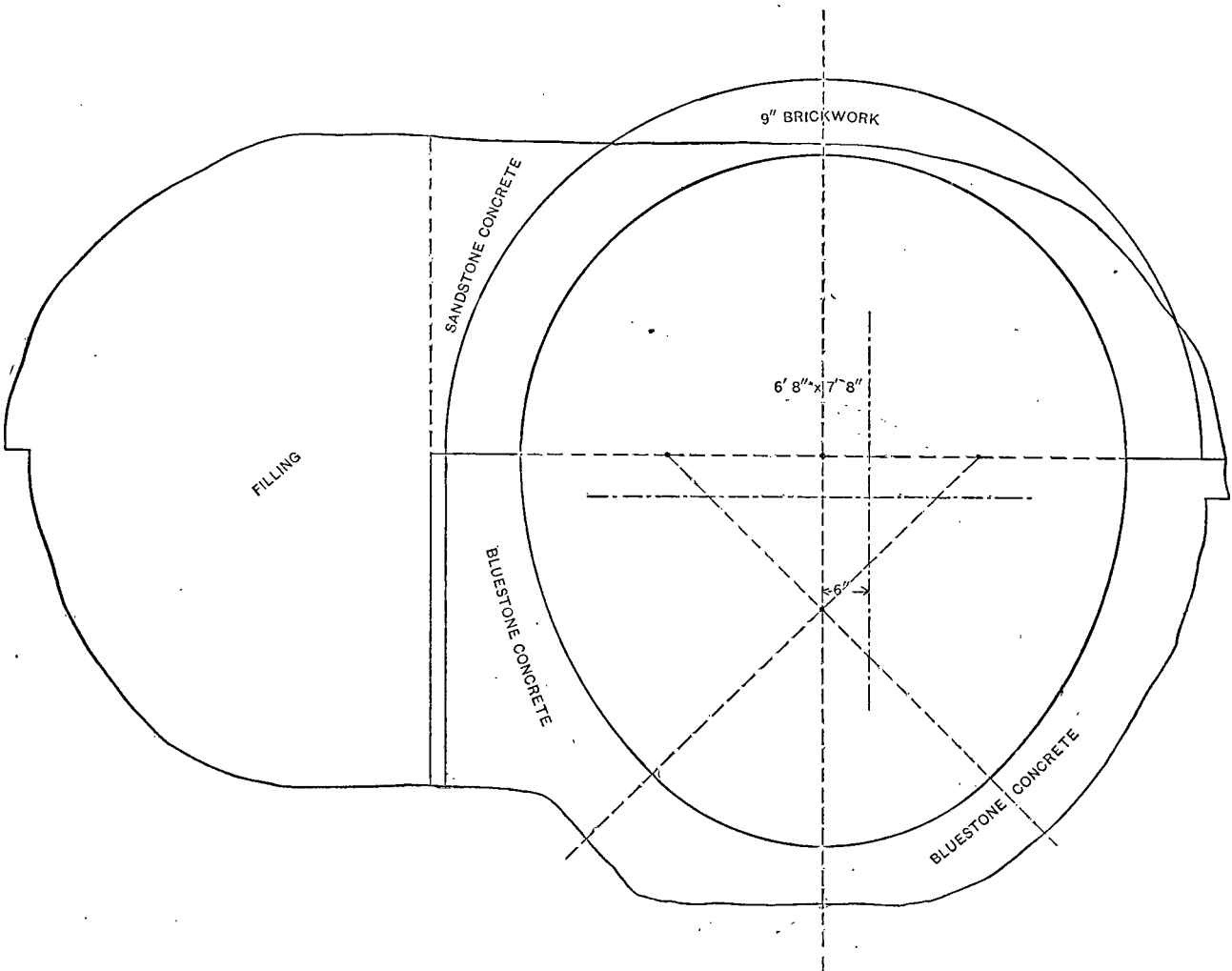
CONTRACT No. 69.—Alteration of Sewer, Premier-street to Illawarra Road.

THE attached tracing shows the cross section of tunnel excavation between Premier-street shaft and Illawarra Road, and the distance the centre line will require to be moved to substitute the 7 ft. 8 in. x 6 ft. 8 in. sewer for the duplicate sewer.

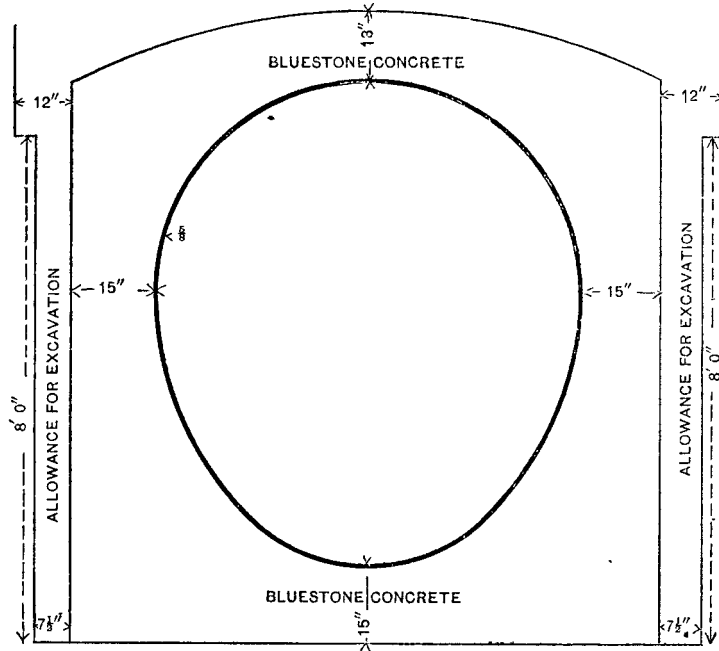
W. J. MILLNER.

Mr. Davis.

WESTERN BRANCH—Cross Section, Tunnel Excavation. Scale, ½ inch.



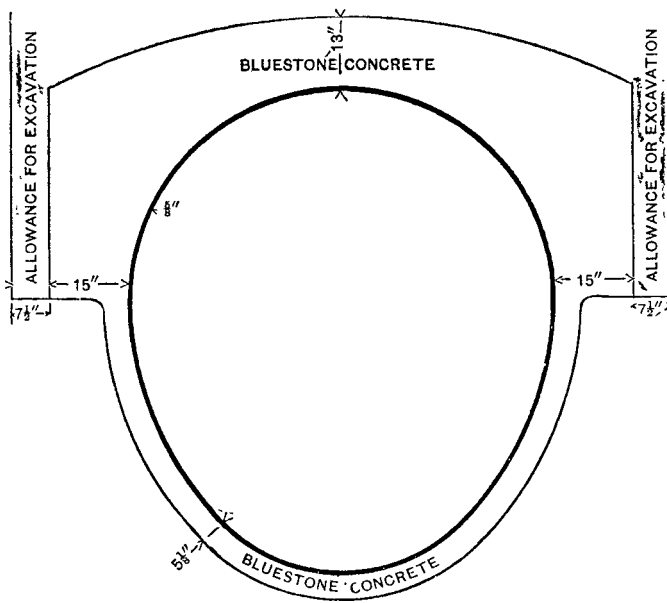
PROPOSED SEWER (7 ft. 8 in. x 6 ft. 8 in. SEWER).



*In open cutting (in soft ground).*

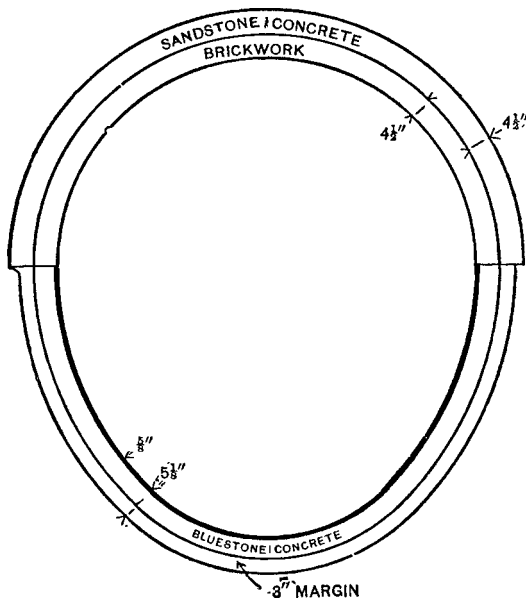
Quantities per foot run of Sewer.

|                            |                    |
|----------------------------|--------------------|
| Excavation .....           | 3.27 cubic yards.  |
| Concrete (bluestone) ..... | 1.75 ,,            |
| Rendering .....            | 2.50 square yards. |



*In open cutting (in rock).*

|                            |                    |
|----------------------------|--------------------|
| Excavation .....           | 2.41 cubic yards.  |
| Concrete (bluestone) ..... | .89 ,,             |
| Rendering .....            | 2.50 square yards. |



*In tunnel (in rock).*

|                            |                     |
|----------------------------|---------------------|
| Excavation .....           | 1.833 cubic yards.  |
| Concrete (bluestone) ..... | .30 ,,              |
| ,, (sandstone) .....       | .111 ,,             |
| Brickwork .....            | .154 ,,             |
| Rendering .....            | 1.337 square yards. |



7 ft. 8 in. x 6 ft. 8 in. Sewer.—Estimate per chain of Sewer.

| Description of Work.                    | Unit.        | Quantity. | Rate.            | Amount.            |
|---|--------------|-----------|------------------|--------------------|
| <b>In open cutting, in soft ground—</b> |              |           |                  |                    |
| Excavation .....                        | cubic yards  | 216       | £ s. d.<br>0 2 0 | £ s. d.<br>21 12 0 |
| Concrete (bluestone).....               | "            | 115·76    | 2 0 0            | 231 10 0           |
| Rendering .....                         | square yards | 165       | 0 2 9            | 22 13 9            |
|   |              |           |                  | 275 15 9           |
| <b>In open cutting, in rock—</b>        |              |           |                  |                    |
| Excavation .....                        | cubic yards  | 159·2     | 0 5 0            | 39 16 0            |
| Concrete (bluestone).....               | "            | 58·8      | 2 0 0            | 117 12 0           |
| Rendering .....                         | square yards | 165       | 0 2 9            | 22 13 9            |
|   |              |           |                  | 180 1 9            |
| <b>In tunnel, in rock—</b>              |              |           |                  |                    |
| Excavation .....                        | cubic yards  | .....     | 1 7 6            | 166 7 6            |
| Concrete (bluestone).....               | "            | .....     | 2 0 0            | 39 12 0            |
| " (sandstone).....                      | "            | .....     | 1 8 0            | 10 6 0             |
| Brickwork .....                         | "            | .....     | 2 15 0           | 27 18 6            |
| Rendering .....                         | square yards | .....     | 0 2 9            | 12 2 6             |
|   |              |           |                  | £256 6 6           |

COMPARATIVE Estimate for Construction of Sewers, Western Branch, Western Suburbs Sewerage.

| Description of Work.  | Unit.        | Quantity. | Rate.              | Amount.            |
|---|--------------|-----------|--------------------|--------------------|
| <i>7 ft. 8 in. x 6 ft. 8 in. Sewer.</i>                                     |              |           |                    |                    |
| Open cutting, in rock, 1 chain .....  | chains       | 1         | £ s. d.<br>180 1 9 | £ s. d.<br>180 1 9 |
| Tunnel, in rock .....   | "            | 25        | 256 6 6            | 6,408 2 6          |
| Open cutting, in soft ground .....  | "            | 26        | 275 15 9           | 7,170 9 6          |
|   |              |           |                    | 13,758 13 9        |
| <i>6 ft. 10 in. x 5 ft. 10 in. and 5 ft. 2 in. x 4 ft. 2 in. Sewers.</i>    |              |           |                    |                    |
| Open cutting, in rock .....   | chains       | 1         | 277 5 6            | 277 5 6            |
| Tunnel, in rock .....   | "            | 25        | 498 4 3            | 12,455 6 3         |
| Open cutting, in soft ground .....  | "            | 26        | 376 7 0            | 9,785 2 0          |
| Extra Excavation—difference in width between double and single sewers ..... | cubic yards  | 3,495     | 0 2 0              | 349 10 0           |
|   |              |           |                    | 22,867 3 9         |
| <b>In open cutting, in soft ground—</b>                                     |              |           |                    |                    |
| Excavation .....  | cubic yards  | 279       | 0 2 0              | 27 18 0            |
| Concrete (bluestone).....   | "            | 154·4     | 2 0 0              | 308 16 0           |
| " (sandstone).....  | "            | 3·43      | 1 8 0              | 4 16 0             |
| Rendering .....   | square yards | 253·44    | 0 2 9              | 34 17 0            |
|   |              |           |                    | 376 7 0            |
| <b>In open cutting, in rock—</b>  |              |           |                    |                    |
| Excavation .....  | cubic yards  | 216·5     | 0 5 0              | 54 2 6             |
| Concrete (bluestone).....   | "            | 91·75     | 2 0 0              | 183 10 0           |
| " (sandstone).....  | "            | 3·43      | 1 8 0              | 4 16 0             |
| Rendering .....   | square yards | 253·44    | 0 2 9              | 34 17 0            |
|   |              |           |                    | 277 5 6            |
| <b>In tunnel, in rock—</b>  |              |           |                    |                    |
| Excavation .....  | .....        | 197·14    | 1 7 6              | 271 1 0            |
| Concrete (bluestone).....   | .....        | 45·54     | 2 0 0              | 91 1 6             |
| " (sandstone).....  | .....        | 20·46     | 1 8 0              | 28 12 9            |
| Brickwork .....   | .....        | 31·75     | 2 15 0             | 87 6 3             |
| Rendering .....   | .....        | 146·5     | 0 2 9              | 20 2 9             |
|   |              |           |                    | £498 4 3           |

COMPARATIVE Estimate—Western and Canterbury Branches—from Chamber, Premier-street, to Shaft, Illawarra Road—8 ft. x 7 ft. Sewer.

| Description of Work.               | Quantity.                             | Rate.            | Amount.              |            |
|------------------------------------|---------------------------------------|------------------|----------------------|------------|
| Excavation .....                   | cub. yds.<br>2·1884 + 388 x 516 ..... | £ s. d.<br>1 7 6 | £ s. d.<br>1,828 1 6 |            |
| Bluestone concrete .....           | 317 x 516 .....                       | 2 3 0            | 351 13 6             |            |
| Sandstone .....                    | 1285 x 516 .....                      | 2 0 0            | 132 12 0             |            |
| Brickwork.....                     | 3588 x 516 .....                      | 2 15 0           | 509 2 6              |            |
| Rendering.....                     | 1·3963 x 516 .....                    | 0 5 0            | 180 2 6              |            |
| Sandstone concrete (filling) ..... | 1·15 x 516 .....                      | 2 0 0            | 1,186 16 0           |            |
| New gas-check .....                | .....                                 | .....            | 85 0 0               |            |
|                                    |                                       |                  |                      | £4,273 8 0 |

COMPARATIVE Estimate—Construction of Sewers, Western and Canterbury Branches, from Chamber, Premier-street, to Shaft, Illawarra Road—8 ft. x 7 ft. Sewer.

| Description of Work.     | Quantity.               | Rate.    | Amount.          |
|--------------------------|-------------------------|----------|------------------|
| Excavation .....         | 2·1884 + 388 x 516..... | 1,329·43 | £ s. d.<br>1 7 6 |
| Bluestone concrete ..... | 637 x 516.....          | 328·69   | 2 3 0            |
| Sandstone „ .....        | 1244 x 516.....         | 64·2     | 2 0 0            |
| Brickwork .....          | 3588 x 516.....         | 185·14   | 2 15 0           |
| Rendering.....           | 1·3963 x 516.....       | 720·49   | 0 5 0            |
| Filling .....            | 8 x 516.....            | 412·8    | 0 0 9            |
| New gas-check .....      | .....                   | .....    | 85 0 0           |
|                          |                         |          | £3,452 18 0      |

COMPARATIVE Estimate—Construction of Sewers, Western and Canterbury Branches, from Chamber, Premier-street, to Shaft, Illawarra Road—6 ft. 10 in. x 5 ft. 10 in., and 5 ft. 2 in. x 4 ft. 2 in. Sewers.

| Description of Work.                     | Quantity.        | Rate.   | Amount.          |
|--|------------------|---------|------------------|
| Excavation .....                         | 2·987 x 516..... | 1,541·3 | £ s. d.<br>1 7 6 |
| Bluestone concrete .....                 | 69 x 516.....    | 356·0   | 2 3 0            |
| Sandstone „ .....                        | 31 x 516.....    | 160·0   | 2 0 0            |
| Brickwork (two rings of brickwork) ..... | 481 x 516.....   | 248·2   | 2 15 0           |
| Rendering.....                           | 2·22 x 516.....  | 1,145·5 | 0 5 0            |
|  |                  |         | £1,173 12 6      |

COMPARATIVE Estimate—6 ft. 10 in. x 5 ft. 10 in., and 5 ft. 2 in. x 4 ft. 2 in.

| Description of Work.     | Quantity.                             | Rate.   | Amount.          |
|--------------------------|---------------------------------------|---------|------------------|
| Excavation .....         | 2·987 x 516.....                      | 1,541·3 | £ s. d.<br>1 7 6 |
| Bluestone concrete ..... | 69 x 516.....                         | 356     | 2 3 0            |
| Sandstone „ .....        | 581 x 516.....                        | 299·84  | 2 0 0            |
| Brickwork.....           | 21 x 516 (one ring of brickwork)..... | 108·36  | 2 15 0           |
| Rendering.....           | 2·22 x 516.....                       | 1,145·5 | 0 5 0            |
|                          |                                       |         | £4,068 14 5½     |

Resident Engineer's Office, Arncliffe, 29 September, 1894.

WESTERN Branch Sewer.—*Re* altering sewer between Premier-street and Illawarra Road.

I HAVE seen contractors *re* expense incurred in centres, &c., which they claim to be—

|  |          |
|--|----------|
| Centres for 5 ft. 10 in. x 6 ft. 10 in. sewer .....        | 16 0 0   |
| Altering centres for 5 ft. 2 in. x 4 ft. 2 in. sewer ..... | 2 10 0   |
| Section mould .....  | 1 0 0    |
| Concrete in pats .....                                     | 15 0 0   |
| Altering road .....  | 3 0 0    |
|  | £37 10 0 |

Mr. Davis.

W. J. MILLNER.

No. 20.

Supervising-Engineer Davis to Messrs. Carter, Gummow, & Co.

Gentlemen, Department of Public Works, Sewerage Branch, 11 October, 1894.

Referring to the conversation which I recently had with you, and to the interview which Mr. Millner had with you two weeks ago respecting the substituting of a single sewer for the double one, shown on contract drawings, between Premier-street shaft and the shaft at the Illawarra Road, I have the honor to inform you that the Engineer-in-Chief has decided to substitute a 7 ft. 8 in. x 6 ft. 8 in. sewer for the double one, and that you will be allowed for the expense you have been put to in connection with the double sewer, as arranged with Mr. Millner, viz., £37 10s.

The cross section of sewer will be as shown on attached tracing. Drawings will be forwarded in a few days of the shaft at the Illawarra Road, and of any slight alteration it may be necessary to make in the inverts of the Premier-street shaft chamber.

In the meantime you will please proceed with the construction of the single sewer, as shown on the tracing attached.

I have, &c.,  
J. DAVIS,  
Supervising Engineer for Sewerage.

No. 21.

Messrs. Carter, Gummow, & Co. to The Engineer-in-Chief for Sewerage.

Sir, Marrickville, 11 November, 1894.

In reply to your letter of 11th October, with regard to alteration of design between Premier-street shaft and Illawarra Road, we beg leave to state that we will accept the terms therein, provided a special item be arranged for the filling at the rate of 5s. per cubic yard.

Yours, &c.,  
CARTER, GUMMOW, & CO.,  
Contract No. 69.

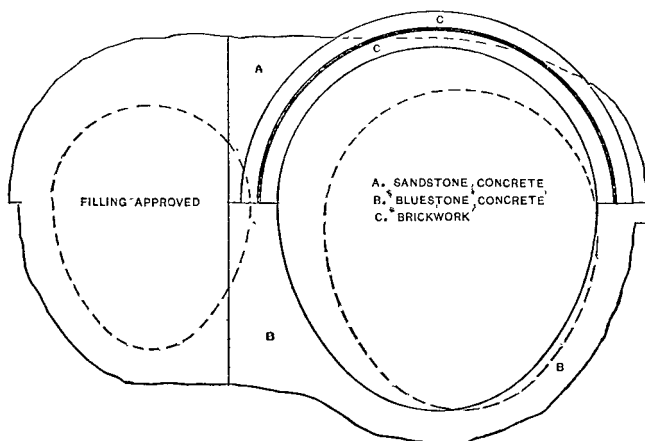
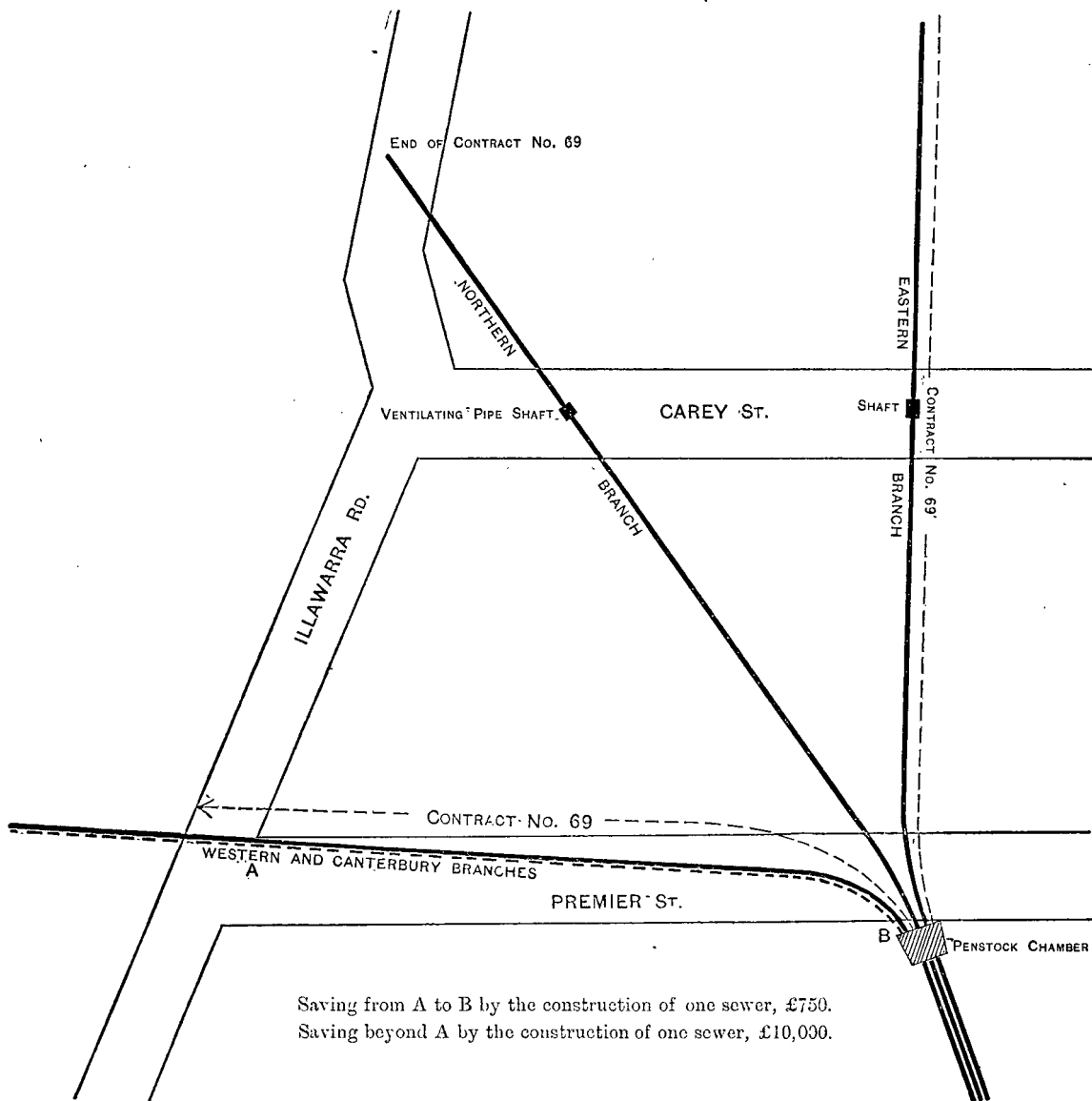
Mr. Davis.—R.H., 11/11/94. Commissioner for Roads.—D.C.M.L. (*pro* U.S.), B.C., 15/11/94. Will Mr. Weedon please let me have quantity of filling.—J.D., 17/11/94. Quantity of filling, due to alteration in design, 410 cubic yards.—S.H.W., 20/11/94.

The

The schedule rate for filling is 6d. per cubic yard, but it is manifest that the contractors, in giving this low price, did not contemplate doing the kind of filling required in connection with the western branch sewer, between Premier-street and Illawarra Road. The 5s. asked is, I consider, a little high, but I suppose, as they will lose something by the reduction of concrete and brickwork, occasioned by the alteration, it will be just to take this into account, and allow them what they ask. There will be about 400 cubic yards of this filling, which, at 5s. per cubic yard, would amount to £100. I recommend that the price named be approved.—J.D., 21/11/94. Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage.

This addition is caused by an alteration in the original design, which has the effect of reducing the cost of the work in this contract by about £750, and a further reduction on the whole work of £10,000. Recommended for approval.—R.H., 21/11/94.

For approval.—J.B., 28/11/94. Approved.—J.H.Y., 29/11/94. Roads.—D.C.M.L. (*pro* U.S.), B.C., 29/11/94. Seen.—R.H., 30/11/94. Mr. Weedon to note.—J.D., 4/12/94. Noted.—S.H.W., 6/12/94. File.—J.D., 7/12/94.



Dotted lines indicate original duplicate sewers; full lines indicate sewer as carried out.

## No. 22.

Supervising-Engineer Davis to Messrs. Carter, Gummow, &amp; Co.

Gentlemen, Public Works Department, Sewerage Branch, 3 December, 1894.  
 In reply to yours of the 11th ultimo, accepting the terms stated in mine of the 11th October, relative to the alteration of design between Premier-street shaft and Illawarra Road, conditionally upon a special item being arranged for the filling at the rate of 5s. per cubic yard, I have the honor to inform you that the Minister has approved of your being paid for the filling in of this length at the price you name.

I have, &c.,  
 J. DAVIS,  
 Supervising Engineer for Sewerage.

## No. 23.

Supervising-Engineer Davis to Messrs. Carter, Gummow, &amp; Co.

Gentlemen, Public Works Department, Sewerage Branch, 8 December, 1894.  
 Referring to my letter of the 11th October last, informing you that the Engineer-in-Chief had decided to substitute one sewer for the two shown on the contract drawing between Premier-street and Illawarra Road, and instructed you to proceed with the construction of the single sewer, I now beg to forward herewith the drawing showing the alteration which this change necessitated in the chamber of the Premier-street shaft.

I have, &c.,  
 J. DAVIS,  
 Supervising Engineer for Sewerage.

(Through Mr. Millner.)

## No. 24.

Supervising-Engineer Davis to Messrs. Carter, Gummow, &amp; Co.

Department of Public Works, Roads and Bridges and Sewerage Branch,  
 Sydney, 23 March, 1895.

*Minute Paper.**Subject:—Shaft at Premier-street.*

THE present size of the shaft at Premier-street, excavated under Contract No. 62, is 12 ft. x 5 ft. In Messrs. Carter & Co.'s Contract, No. 69, provision has been made for enlarging the shaft to 14 ft. x 7 ft., and to line it with brickwork. The top of the shaft is left open, and surrounded by an iron railing, which would not prevent children and others getting into this shaft.

I do not think that there is any necessity to make the shaft larger than it is at the present time, and the iron railing would certainly be dangerous.

I recommend that the shaft be not increased in size, that it be lined with bluestone concrete, and that it be arched over, and a manhole cover be put on in the usual way. The saving that will thereby be effected will amount to £50.

J. D.

Approved.—R.P.H., 25/3/95. Messrs. Carter, Gummow, & Co., 25/3/95. Mr. Millner to note.—J.D., 25/3/95.  
 Noted.—W.J.M., 29/3/95. Mr. Davis. File.—J.D., 30/3/95.

## No. 25.

Supervising-Engineer Davis to Messrs. Carter, Gummow, &amp; Co.

Gentlemen, Public Works Department, Sewerage Branch, 25 March, 1895.  
 I have the honor to request that instead of enlarging the Premier-street shaft to the size (14 ft. x 7 ft.) shown on the contract drawings and lining it with brickwork, that you will please line the shaft with bluestone concrete in the usual way, not increasing its size; and instead of putting the iron fencing round the top as shown on contract drawings, that you put a concrete arch with manhole cover as is the habit in such cases.

I have, &c.,  
 J. DAVIS,  
 Supervising Engineer for Sewerage.

## Appendix No. 62.

## UNDERTAKING.

hereby acknowledge to have received of and from The Minister for Public Works in and for the Colony of New South Wales the sum of \_\_\_\_\_ sterling being the amount originally placed at fixed deposit to the credit of the said Minister as security for the due performance by \_\_\_\_\_ of \_\_\_\_\_ Contract for \_\_\_\_\_ which amount \_\_\_\_\_ admit is paid over to \_\_\_\_\_ as a matter of grace and not of right and \_\_\_\_\_ hereby undertake and agree that this payment shall not operate as a bar to \_\_\_\_\_ maintaining the said works for the full period nor as a waiver of any of the rights or remedies of Her Majesty the Queen the Government of the said Colony the constructing authority or the said Minister under \_\_\_\_\_ said Contract.

As witness \_\_\_\_\_ hand and seal at Sydney this \_\_\_\_\_ day \_\_\_\_\_ in the year of Our Lord one thousand eight hundred and ninety \_\_\_\_\_

Signed sealed and delivered by \_\_\_\_\_  
 in the presence of \_\_\_\_\_

## Appendix No. 63.

TUESDAY, NOVEMBER 19th, 1878.

*Present*—Arbitrators:—The Hon. Sir William Milne, Knight, on behalf of the Government; Samuel Tomkinson, Esquire, on behalf of Messrs. Wells Bros.; The Hon. Sir Henry Ayers, K.C.M.G., Umpire.

Mr. Downer, Q.C., appeared as Counsel for the claimants (Messrs. Wells Bros.); Mr. Symon appeared on behalf of the South Australian Government.

Mr. Robert Hickson sworn.

*Examined by Mr. Symon:* I believe you are the Engineer of Harbours and Jetties for the South Australian Government? Yes.

You know Messrs. Wells Bros.—that is, Mr. George Wells and Percy Wells? I do.

Did you see Mr. George Wells in the year 1876? Yes.

I believe you yourself came to this Colony in the same year, and entered on your present duties? I did.

In what month? In May, 1876.

Did you know Mr. Cheesewright then? Not at that time. I knew him very soon afterwards.

Had you any communication with Mr. George Wells with reference to Mr. Cheesewright? Mr. George Wells called at my office soon after I came, and mentioned the fact that Mr. Cheesewright was here as his agent, and was prepared to tender for two piers—one at Kingston and the other at Rivoli. He said he had to leave the colony and go home to London soon after that.

Was

Was there a contract at that time for the Tiparra lighthouse? Yes; that contract was made before I came out here. That was signed by Mr. George Wells, I believe? Yes.

How did Mr. George Wells get that work? He supplied the plans and put in a tender.

*By Mr. Downer:* Do you know that yourself—I mean of your own knowledge? Yes; he offered to do the work for a certain sum.

Was the tender in writing? Yes; and the acceptance too. That is how I know the circumstances connected with that contract, the documents being in my office.

*By Mr. Symon:* You have the documents now, I suppose? Yes, in the office.

They can be put in, if necessary, at the proper time. Can you tell me how the Rivoli Bay and Kingston contracts were arranged for? I understood the same arrangement was made as in the case of the Tiparra lighthouse.

That is to say that plans and estimates were to be sent in by Messrs. Wells Bros., tenders not being publicly invited? Yes.

Do you remember Mr. George Wells leaving for England? Yes, I remember the fact of his leaving.

Pursuant to what you have told us, were plans and estimates sent in by Mr. Cheesewright for those two works? Yes.

I think these are the plans, are they not [*pointing to M1 and N1*]? Yes.

*The Umpire* (Sir Henry Ayers): Other documents connected with those drawings have been put in, and marked O1 and R1.

*Mr. Symon:* Yes; I propose to refer to them.

*To the Witness:* The documents marked O1 are the estimates which accompanied the drawings M1 and N1, are they not? Yes.

I believe nothing was done upon these plans? No.

Why was that? The Government decided to call for tenders from a few firms, and applications were made to five or six different firms to send in tenders. For that purpose plans were sent to London.

What plans did you send to London? Tracings were made of the drawings M1 and N1, and sent to London. From those tracings lithographs were prepared, and upon the lithographed drawings tenders were invited.

*By Mr. Downer:* Have you got the original drawings? No.

But the drawings which you have there—the contract drawings—are printed papers. I should like to see the original? I have not got the original; it went to London, and from it the lithograph was prepared.

*The Umpire* (Sir Henry Ayers): It is clear that the original drawing is not in the possession of the Government, and I think, therefore, it is competent for the learned counsel for the Crown to make use of the lithographs prepared from that original drawing as secondary evidence.

*By Mr. Symon:* Can you tell me why such a short time as three weeks was fixed for the sending in of those tenders? Virtually, I looked upon it that Messrs Wells had the contract, and that it was practically useless to keep the drawings on view for any length of time in London. I looked upon it as merely a matter of form sending the drawings Home.

I think the contract was signed in London; but with regard to that, you, of course, know nothing personally? No.

Do you recollect Mr. Percy Wells coming out here? Yes; he was in the office one day, and I mentioned the fact to him, that the tenders sent in by the London firm were somewhat lower than the tenders sent in by Cheesewright, and he explained that.

What did he explain? He said that his firm were very anxious to get the work. They found that Mr. Cheesewright's tender here would be known; and they found, on examining the estimates, that they could somewhat reduce the contingency item, or the item for erection. That was the reason they gave for the London tender being lower than the Adelaide tender.

Did Mr. Percy Wells, at that interview, raise any question about Mr. Cheesewright's authority? No.

After Mr. Percy Wells came here, was any other plan of Mr. Cheesewright's sent into the Government in connection with other work? Yes; there was an offer to erect the Port Adelaide beacons.

Have you a drawing of that? Yes; this [*producing the same*], is a drawing sent in June, 1877, signed at the top by Messrs. Wells, and at the bottom by Mr. F. H. Cheesewright. [*The same was handed in and marked V1.*]

Do you also produce the tender based upon that plan for the Port Adelaide beacons? Yes, here it is [*producing the same*]. [*The same was handed in and marked W1.*]

*Sir William Milne:* Do I understand that Mr. Cheesewright sent in that plan?

*Mr. Downer:* No, that is not the case—Mr. Cheesewright designed it; he was the draftsman only. Messrs. Wells sent the drawing in, and the letter containing the tender was signed by Messrs. Wells Brothers.

*By Mr. Symon:* Did anyone assist Mr. Cheesewright in the preparation of the plans for the piers at Rivoli Bay and Kingston? Yes. He told me that Mr. Edmond Wells was assisting him in the preparation of those drawings, and I may say that, on one occasion, I saw Mr. Edmond Wells assisting Mr. Cheesewright on those drawings.

That is the gentleman who was examined here as a witness, I think? Yes, a son of Mr. Percy Wells.

Will you look at contract drawing No. 2;—is that drawing intended to show the exact length of the piles at the sections marked thereon? With the exception of the cross-section at YY, it is not.

Is the fact that the piles appear to be broken off above the screw in any way conclusive as to the length of the piles? Not in my opinion. We sometimes break them off, and sometimes we do not.

Would anyone, whether he were a contractor or an engineer taking a glance at the plan, see at once that that drawing did not give the length of the piles? Certainly.

Will you explain that with reference to section SS and the section of the wide part? At those sections the piles are shown of exactly the same length. This section of the wide part at Kingston Jetty refers to three different portions of the pier; one at a short distance from the end, another at 3,200 feet out, and a third 900 feet beyond that again. If that section were intended to show the exact length of the piles at all those places, the piles should be of the same length at each of the wide places, which would be manifestly absurd.

What does section SS show? It shows the narrow part of the pier at any portion.

For what purpose? It is intended to show the detail of the superstructure.

Mr. Percy Wells stated that the Government were to be congratulated on the contractors not accepting that drawing No. 2, as giving the length of the piles. What would have been the result if they had done so? The result would have been that in some cases instead of going 9 or 6 feet into the ground the piles would have gone down some 16 feet into the ground; and further out they would not have reached the ground at all, but would have been suspended in the water like candles in a row.

Now look at the contract drawing No. 1;—in your opinion, would any contractor or engineer accept that drawing as giving him the accurate length of the piles to be furnished for the jetty? Certainly not.

What would be the course which a contractor would adopt with reference to that plan, if he had no other information? There are two courses which a contractor would adopt. The first would be to refuse to tender, until he was furnished with further information, and the second would be that which appears to have been adopted by the other tenderers in this case—to put on a large sum for risk. The tenders were very wide indeed, some of them being much above the price quoted by Messrs. Wells.

I understand you to say that the second course was the one adopted by the other contractors or tenderers on this very occasion? I presume that that was so, because the other tenders were so much higher.

What was the difference between the tender sent in by Messrs. Wells and the other tenders received? Messrs. Wells' tender for the work at Rivoli Bay was £23,000, the next was £32,000, the third £34,000, and the fourth £29,000. I may mention that the fourth tender was only for the one jetty at Rivoli Bay. For the work at Kingston Messrs. Wells' tender was £30,000, the second tender £45,000, and the third tender £50,000.

If that drawing, No. 1, were to be accepted as showing the length of the piles in any case, is there any reason why you should measure from the deck to the ground-line rather than to the flange of the screw? If the drawings were to such a scale that it could be practically done, the more reasonable course would be to take the measurement from the deck-line to the flange, the total length of the pile.

I need hardly ask you, after the evidence we have had, whether it is possible to scale accurately the length of the piles required from that drawing? I should say certainly not.

If that drawing were to scale, would you expect to find all of it to scale? Most decidedly.

Would you kindly point out to the Arbitrators the tests which any reasonable man would apply? If scalable, the plan should be scalable in every part. The width of the deck, the distance of the piles from one another, and the curves should be accurately shown.

Do you agree with Mr. Rees that the curves are not drawn to a radius? They are drawn with a pen and rule only; they are not drawn to any radius. In almost every place that you try the drawing it is not done accurately to scale. The landing stairs, for instance, are quite out.

Is it possible in any way from Drawing No. 1 to ascertain the material required for the jetty? Not as to the length of the piles. The drawing will give what it was intended to give, viz., the number of the piles and general information.

What Mr. Rees, I think, called a general indication? Yes, and what I should call a general indication—that is to say, the number and width apart of the piles and the position of the turn-outs, &c., but not as to the length of any pile.

You have heard about the deck-level at Rivoli Bay;—at the time that the deck-level was fixed was the Admiralty bench-mark found? No; I did not even know that there was an Admiralty bench-mark there at that time.

It has been found since? Yes.

How much is the deck-level above or below the Admiralty mark? Where it starts it is some 11 or 12 inches, I think, higher than the Admiralty bench-mark.

You have no doubt heard that there has been a fall in the construction of the jetty of some 15 inches? Yes.

So that the net result would be that the deck-level of the jetty is an inch or two below the right level? Yes, some 3 inches.

How did that fall come about? Through the careless workmanship of the contractors.

Is there any other instance of their carelessness in the case of the Rivoli Bay jetty? Yes; the jetty is supposed to be straight, but there is a very considerable curve in it.

The jetty has only been constructed up to the 40th bay, I believe? Yes; it is 6 feet out of the curve—that is, the height of the curve is 6 feet out in that distance.

You remember, no doubt, that a claim was made by the contractors in respect of the alteration of the site? Yes.

When that claim was made, did you go down there? Yes; I went there as soon as I could.

With what result? I could not see that the contractors had any claim at all.

Will you explain what you found? On examination I saw that the contractors' material was stretched along the beach in this way—(the witness proceeded to explain to the Arbitrators the relative positions of the present jetty, the temporary jetty, the site originally fixed, the contractors' material, &c.)

Is there any reason whatever for saying that the contractors incurred additional cost by restacking or moving any material? Not the slightest, in my opinion.

When did you last see the site? Just about when the works were stopped—about a month afterwards.

Was the material in the same position then as before? There was a little more perhaps, but not very much.

Will you kindly tell the Arbitrators how much open beach there was;—was it possible to lay any of the material on the flat beach without levelling the sandhills? No.

Was this levelling of the sandhills in any way attributable to the change of site? Not in the slightest.

Was there any extra expense incurred by the change of site? No; for the convenience of the work it could not be better stacked than it was.

What would be the value of any rejected piles per ton on the ground, assuming that there were no other works there to which they could be immediately applied? Assuming that they had to go back to England, I should say £10 or £12 per ton.

*The Umpire* (Sir Henry Ayres): What is the first cost? About £7 per ton.

*Sir W. Milne*: I cannot understand that. Is the freight included in the £10 per ton to which you refer? Because, if so, that must be deducted in calculating the value of the piles if sold in England.

*The Umpire* (Sir H. Ayres): There is evidently some misunderstanding. If they are only worth £7 per ton in the manufacturer's yard, they clearly will not be worth £12 per ton when returned.

*The Witness*: The cost of the piles would be a great deal more than £7 per ton. I thought the question asked me was meant to apply to the cost of ordinary rolled wrought-iron, which would be about £7 per ton.

*The Umpire* (Sir Henry Ayres): What would be the original cost of those wrought-iron piles in England? About £10 per ton.

I understood the interrogation of the learned counsel to be as to the value of the piles if sent home to England for sale after rejection; but, supposing that they were rejected and sold here, what should you say would be a fair price to give for them on the ground? About £12.

*Sir W. Milne*: That would depend, I presume, upon whether the piles could be put to any use in the Colony. In other words, the price which the piles would fetch would very much vary with the demand which might exist for wrought-iron in that shape? Yes, that is so.

*Mr. Symon*: Have you any knowledge of screws with larger flanges than were at first contemplated by the contractors having been used at Kingston? Yes; they got some screws with large flanges from Rivoli Bay, when they came to ground which was of a soft nature, so as to secure the requisite basis for the piles.

Have you examined the piles that have been put down there? Yes; I saw a few of them.

Did you thereupon appoint a clerk of works to superintend the progress of the jetty? Yes; I did not think the work was going on satisfactorily. The result of my own examination was to convince me that the work was not progressing as satisfactorily as it ought to do.

In what way? There was the curve of the jetty to which I have referred, and both jetties were out of level, which made me think that the supervision of the work was exceedingly careless.

In what way was there a departure from the correct level? The platform of the jetty was out of level, being in some places 7 inches higher than in others.

Had the work been done carefully it would not have been out of level? No.

I think you have personally checked the returns of the contractors with the scaling, as far as it is possible, of contract drawing No. 1? Yes.

Have the contractors ordered their piles in any way according to the scaling of contract drawing No. 1? No.

Do you know anything about the changing nature of the bottom, the shifting of the sand, and so on? Not of my own knowledge.

Nor as to the nature of the ground-line at Rivoli Bay? No.

*Cross-examined by Mr. Downer*: When was it that the Government first resolved on building these jetties? It was not actually resolved on until the passing of the Bill in Parliament. I understand that the consideration of the desirability of constructing the jetties was on the *tapis* before I came.

They were being talked about when you came here? Yes.

Had anything been said about the erection of the jetty at Rivoli Bay at that time? Yes; before I got here.

In what month was it that you saw Mr. George Wells? It was either in May or June.

What was it that Mr. George Wells saw you about? It was specially in reference to a pier in Largs Bay.

Was it not about the Cape Jaffa Causeway? There was nothing said about that for months afterwards—at least, not to me.

When Mr. George Wells saw you the first time was not that the subject of conversation between you? Certainly not.

How many times did Mr. George Wells see you? About two or three times—twice in my house, and once at Mr. Wright's.

And the Cape Jaffa Causeway was not the subject of conversation at the first interview? I think not. I do not believe Mr. George Wells spoke to me about it.

Are you quite sure that you spoke to him about the Kingston and Rivoli Bay Piers? He spoke to me.

And he told you that Mr. Cheesewright was here as his agent to tender for the jetty? Yes.

Was there any other work going on at that time that Messrs. Wells were interested in? There was the Tiparra Lighthouse, in which Mr. George Wells was interested.

And you know that Mr. Cheesewright came out to superintend that work? Yes.

How long after you saw Mr. Wells was it that you communicated with Mr. Cheesewright as to those jetties? He communicated with me.

How long was that after you saw Mr. Wells? The date of his drawing would show the time. The drawing is dated September 13th, and probably the first communication was in June.

Did you ask him to do anything for you in respect of those jetties? No.

Did

Did he ever go to the site of the jetties? Yes; he went to Kingston with me.

Was he ever at Rivoli? I do not know.

Do you not know that he was not? I have heard that he was not at Rivoli Bay.

Do you know how many times he was at Kingston? I do not. I know he was there once, and took a lot of soundings.

Was that when he was with you? He went down with me, but he took the soundings on his own account.

Were you there then? Not taking the soundings. I went away to Mount Gambier, and as I was on my way I saw him out in a boat taking soundings.

Did you invite him to go with you? I did not invite him to go with me. I told him I was going, and that if he liked to come with me he might. So far I invited him.

Did you pay his expenses? Subsequently they were paid. I recommended the Government to pay Mr. Cheesewright's expenses when they decided to call for tenders.

I think in that recommendation you said that Mr. Cheesewright went down chiefly to assist you? Words to that effect. I thought they should pay his expenses under the circumstances.

Was not the reason you gave for his expenses being paid that he went down to assist you? I could not tell without reference to the letters; I daresay it was. As it turned out, the work he had done before on his own account came to be of value to me.

Do you know that Mr. Cheesewright's expenses were paid before the Government resolved upon inviting tenders? They were not paid until I heard that the Government had resolved on inviting tenders.

When did Mr. Cheesewright and you go to Kingston together? I really could not fix the date.

About when? I should think somewhere about July.

When was it that he sent in a tender? He sent in a tender in September, but one had been sent in by him as early as June.

Did you know before Mr. Cheesewright sent in this tender that the Government intended to invite tenders in England? I could not say that I knew officially, but practically I did know.

Then Mr. Cheesewright's sending in tenders was rather an empty form? I did not tell him to send in the tenders. As I have said, he thought proper to send in a tender in September.

*The Umpire* (Sir H. Ayers): The letter is dated 7th September, 1876; that is to say, a few days earlier than the plans.

*By Mr. Downer*: Did you recommend that Mr. Cheesewright's expenses should be paid before the 7th September? I do not think it was till after that date, but I am not quite sure.

Did you not on the 2nd September recommend that Mr. Cheesewright's expenses should be paid? I think it was about that date.

Did you not report to the Government that Mr. Cheesewright did not go so much as an intending tenderer as for the purpose of ascertaining the relative advantages of an iron and a wooden structure? Yes.

Was that what he went for? Yes. He at one time refused payment himself on the ground that he might be a tenderer. But, as I have said, the information which he went down to obtain on his own account came to be of value to me, and therefore it was only right that the Government should pay his expenses when they decided to call for tenders.

Therefore it appears to me that your recommendation to the Government was not very accurately worded when you said that Mr. Cheesewright did not go so much as an intending tenderer as for the purpose of ascertaining the relative advantages of an iron and a wooden structure? It was not quite accurate, strictly speaking.

Did you know that it was, strictly speaking, inaccurate when you wrote that recommendation? —

Mr. Symon remarked that he was at a loss to understand how the minutes from which his learned friend was quoting came into the possession of the claimants. He must say that the whole thing appeared a little extraordinary in the absence of any explanation.

*Mr. Downer* (to the witness): Did you know at the time you wrote that letter that it was inaccurate? I can see now that it is not, strictly speaking, accurate.

I suppose when you wrote it you did not consider whether it was true or not? That is putting it rather strongly.

Did you consider when you wrote it that it was true? Yes.

Then you had no thought that it was inaccurate when you wrote it? No.

Did Mr. Cheesewright prepare the plans for you? No; he prepared them for Mr. George Wells.

Were they prepared in the Government office? He asked me to allow him to use my office, and I did so.

I think you informed the Government that if Mr. Cheesewright had not done the drawings you would have had to employ someone qualified to prepare them;—did you report to the Government that from Mr. Cheesewright's extensive experience in these matters you considered him the most competent person to supply information in connection with those jetties? Yes, I did. I considered him a very competent man.

I think you reported that if he had not done the work you would have been compelled to get some addition to the present staff, even supposing you could have got it done at all, which you thought was doubtful? Yes.

How long after that was it that the plans were sent home? The plans were sent home at the end of that year. I could not say, from memory, exactly when.

Towards the end of the year? Yes.

*By the Umpire* (Sir H. Ayers): Probably soon after the Bill was passed? Yes; probably soon after. The Session closed in the end of November.

*By Mr. Downer*: I understood you to say, in reply to my learned friend, that you saw Mr. Cheesewright taking soundings from a boat? Yes.

At that time was the site of Kingston jetty resolved upon? Yes; it was resolved upon before I came here.

Will you say that the jetty is built on the site that was then resolved on? Not quite.

Within a quarter of a mile? Yes; it goes exactly from the same point on the shore.

Will you swear that? The site that was pointed out to me as being the site first fixed upon is exactly the same as regards the shore end, though the direction out to sea is somewhat different.

Was not the first site fixed upon south of the present jetty? No; not the one at present fixed upon.

Was it not south of the wooden jetty that Mr. Cheesewright was taking soundings? I cannot say where it was exactly that he took the soundings.

Did you not show him the place in which he had better take soundings? I only showed him the starting-point of the present site.

Had any borings been taken at that time? I think not at that time. If you mean at the time Mr. Cheesewright had been there, borings had been taken then, but not when the site was first determined on.

Did you employ anyone to take borings? Yes; Mr. Wright.

Mr. Cheesewright made no borings? I think not.

Did he not write and tell you that he had taken none? I do not remember, but he certainly did not take them the day that I was there.

When were any borings taken? I cannot fix the date.

Have you heard that they were taken south of the old wooden jetty? I have not heard that.

*By Mr. Tomkinson*: You said that you saw Mr. Cheesewright taking soundings. You were not with him in the boat at the time, I understand? No; Mr. Cheesewright was out in a boat at some considerable distance from the shore, whereas I was on the land, and not in a direct line with the boat, so that I cannot tell exactly where he was taking his soundings.

Was it on the north or south side? I presume it was on the line I showed him.

The jetty, now in course of construction, is a little to the north of the old jetty, is it not? I gave him a general idea of the site of the jetty, and, I think, I gave him a landmark indicating the line of the jetty as then proposed.

And then he took soundings? Yes.

Did he give you the result of his soundings? That is the result of his soundings [*pointing to the drawing No. 1*].

*By the Umpire* (Sir H. Ayers): Was that the intention of the Government at first, to have a wooden jetty? I cannot say from personal knowledge.

*By Mr. Downer*: When Mr. Cheesewright went with you I thought you were under the impression, as you said afterwards, that the principal object was to test the relative merits of a wooden or an iron structure? I do not know that the Government really intended to put up a wooden structure—at any rate, an iron one was decided upon.



*By the Umpire* (Sir H. Ayers): Probably Mr. Cheesewright came into the matter because he understood that the Government thought of having iron instead of wood, and that alteration had a personal interest for him? Yes, no doubt.

*By Mr. Downer*: Did you prepare any plans here? Yes; we prepared them from Mr. Cheesewright's drawings. No. 1 was a tracing of Mr. Cheesewright's drawing, and from that the lithograph was prepared. Drawing No. 2 was altered, because the superstructure designed by Mr. Cheesewright was not considered adapted to the purpose for which it was intended.

Have you scaled Mr. Cheesewright's drawing, No. 1, with your drawing, No. 1? I have put one over the other, which is a better way of comparing them.

Are there not great differences between them, varying in some places from 3 to 6, and even 7 feet? Lengthways, I expect, there is more than that.

In the ground line what difference would there be? I daresay there might be 18 inches, because a line on that scale would make the difference.

Looking at this drawing, No. 1, do you say that it is lithographed from a copy of Mr. Cheesewright's drawing? It must have been.

Have you scaled the two comparatively? No. I have put one over the other.

Are there not places where the difference from the ground line to the platform of the jetty amounts to as much as 5 feet? I do not think so.

3 feet? I do not think so.

I shall have to trouble you to see. Will you try the 250th pile, at Rivoli Bay? There is a difference of 2 feet, apparently, on the scale in the drawings; but the next pile to that appears to be exactly right.

Try 260? There is also a difference of 2 feet.

Take pile 240? There is hardly any difference at all.

Pile 230? There is about 2 feet difference.

*By Mr. Symon*: I suppose that difference is hardly perceptible on so small a scale? No. I should be really very much surprised if it were exactly the same, considering that it has been lithographed from a tracing of a tracing.

*By Mr. Downer*: Try pile No. 10? The top line here is very thick, and represents on the scale to which the plan is drawn about 2 feet. I will take from the centre, that is also about 2 feet out. The tracing appears to have shrunk.

Try No. 80? That is as nearly as possible 3 feet wrong. The lithograph plan has been shorter all the way through, owing, I suppose, to the shrinking of the paper.

Try No. 90? That is 3 feet out—that is to say, the lithograph makes the pile appear shorter than it does on the tracing.

*By Mr. Tomkinson*: Would that cause the piles to be sent out wrong? I say not; because the piles could not be taken from this drawing at all.

*By Mr. Downer*: Take No. 60? That is about 2½ feet out.

Try pile No. 100? That is the same. It is out to about the extent of the width of the top line.

Will you take pile No. 160? That is about the same.

Now turn to Kingston, pile No. 220? It is almost exactly the same, as near as I can get it. The top line at this pile is a little over 2 feet wide, and I have taken the centre; I can make 4 feet difference between them, by taking the bottom of the one and the top of the other.

Try pile No. 230? It is about 1 foot out.

*By Mr. Tomkinson*: Are you measuring from the deck of the jetty to the ground line? Yes. In pile 280 Cheesewright's plan makes it appear 1 foot longer.

*By Mr. Downer*: Try No. 200? It is almost exactly the same.

Take pile No. 90? There I make them to agree.

*By Sir William Milne*: I would like to test Mr. Cheesewright's drawing in a regular gradation. Take pile No. 16, what is its total length? 11 ft. 8 in. after deducting the superstructure.

Try pile 52? 14 ft. 8 in.

Pile 86? 15 ft. 8 in.

124? That is also 15 ft. 8 in.

160? 18 ft. 8 in.

196? 20 ft. 8 in.

230? 21 ft. 8 in.

268? 23 ft. 8 in.

302? 24 ft. 8 in.

340? 26 ft. 8 in.

374? 28 ft. 8 in.

393? 29 ft. 8 in.

Now, will you turn to the 11th pile, at Rivoli Bay? 20 ft. 8 in.

35th pile? 16 ft. 8 in.

59th pile? 19 ft. 8 in.

The 83rd pile? 22 ft. 8 in.

The 131st pile? 28 ft. 8 in.

The 155th pile? 30 ft. 8 in.

The 179th pile? 30 ft. 8 in. also.

The 203rd pile? That is 38 ft. 8 in.

The 227th pile? 31 ft. 8 in.

The 251st pile? 32 ft. 8 in.

The 263rd pile? That is 31 ft. 8 in.

Sir William Milne stated that in the questions he had just addressed to the witness he had been examining from the papers put in, showing the piles sent out from England, and he had taken them in regular gradations at the points where the contractors increased their lengths of piles by 2 feet at a time, as shown by the documents marked E 1 and K.

*Mr. Downer* (to the witness): You say that Mr. Cheesewright took the soundings? Yes.

What length did you intend the jetty to be when you went down with Mr. Cheesewright to Kingston? It was to be the same length as it is now, 6,080 feet.

Was it not to be 4,000 feet? No; that was Rivoli Bay. The Rivoli Bay jetty was to be either 4,000 feet or 4,700 feet long. The Kingston pier was to be 6,080 feet long.

Was it not the original intention that the Kingston jetty should be 4,000 feet long? Not in my time. It was to be 6,080 feet long.

Will you look at the letter marked O 1;—I believe that is a letter dated the 7th September, and signed by Mr. Cheesewright? Yes; that is the letter which Mr. Cheesewright sent.

You say that the Government resolved to send the plans Home in order to get tenders? Yes.

How many people were invited to send in tenders? I do not know.

Did you not send Home a lot of names of persons who ought to be invited to tender? No, certainly not.

What plans were sent Home to tender by? There were five plans sent Home, one of them being common to both jetties.

You say you never sent Home the names of persons who were to be asked to tender;—did you not recommend that a person of the name of Gibson should be invited to tender? Yes; I think I did. He was a man who had done a lot of work for me.

Not anybody else? No. There were two reasons why I recommended Mr. Gibson. One was that I knew him to be a good man, and the other that his son was here on the spot, and was getting the same information as was obtained by Mr. Cheesewright.

You say that a contractor who was a stranger, and who knew nothing about the place, would have found a great difficulty in tendering on your plans? Yes, great difficulty.

Such a man would not have taken the ground line as correct? No.

He might have asked for further information? Yes; or he might have put on a large sum for risk.

But

But you see, in the way you put it, that ground-line meant nothing at all, and there might, consistently with those plans, have been a chasm between the start and the finish? There could not have been, because there was the Admiralty survey to guide them. There was an Admiralty survey on drawing No. 5, which would have helped them in the event of any great discrepancy. This is the drawing [pointing to drawing No. 5, marked G].

Have you ever invited tenders for any work of that kind? Yes, from Mr. George Wells himself, but it was not jetty work.

Is it not usual in inviting tenders to give the contractors some better information than is afforded by the drawings now lying on that table? Most undoubtedly, and it would have been given in this case only that the contract was regarded as virtually let to Mr. Wells.

Why did you think that, when the Government had decided to invite tenders from other people? Because he was the only man who had the requisite information.

And you thought none could be got from your drawings? To make proper contract drawings it would have delayed the work some months, and a drawing to a proper scale would have been about 60 feet long.

Is it not usual to give sectional drawings? Yes.

Why did you recommend Mr. Gibson? I recommended Mr. Gibson because his son was here; but he was placed in some difficulty, as the son was in my employ at the time, and I do not think he did send the information Home.

Have you heard that Messrs. Wells Bros. repudiated Mr. Cheesewright's authority to tender at all? Yes, I have heard of it.

When did you first hear that? The first mention of it, to my knowledge, was after this work had commenced. I think Mr. Percy Wells was the first who told me.

Do you remember when you first saw Mr. Percy Wells here? He called on me in 1876. I think he came out here after I did.

You saw Mr. Percy Wells, at any rate, soon after he came here? Yes.

Did you tell him anything about those tenders of Cheesewright's? I do not know whether I did or not. I had no occasion to make reference to them.

Did you have any conversation with him about those piers at Kingston and Rivoli Bay? I think most likely we had some conversation, but I have no recollection of it.

You saw him frequently? Yes, very often.

But do not recollect that he came to you on the subject of those piers? I do not think he did specially.

Did you tell him that you were going to send those drawings Home, or did you tell him afterwards that you had done so? I think it is very likely.

Did you have any conversation with Mr. Percy Wells about Mr. Cheesewright? Yes.

Did Mr. Percy Wells tell you that Mr. Cheesewright had no authority, except to erect certain works? Certainly not.

Did you make any calculations yourself as to the cost of erecting those piers? Yes.

On what data? I made a rough estimate on those plans.

On the information which you got from Mr. Cheesewright? Yes.

You had no information beyond what you got from Mr. Cheesewright? Yes; we had a great deal. All the details are ours. Mr. Cheesewright's detail drawings were so very bad that I had to alter them.

When did you find out that Mr. Cheesewright's detail drawings were so bad that you would have to alter them—was that directly after they were sent in? Yes; just immediately afterwards. The details were made without any regard to the strength which would be required to enable the structure to carry waggons and so on.

Drawing No. 1, you say, was only intended to show the number of piles required, and the general appearance? Yes; the number of piles is over-riden, I think, by the specification as to the length.

I am asking you whether drawing No. 1 was intended to show correctly the number of piles? Yes.

Was it intended to show anything else correctly? The length of the jetty, the position of the turnouts, the width and general appearance of the T-head, &c. The depth of the pier-head was also shown.

That was practically all that it was intended to show? Yes.

Did you make any estimate of the quantity of ironwork that would be required? Yes; a rough estimate.

Not such an estimate as people would tender upon? No.

Have you got your estimate book? Not here.

Is the estimate entered in your estimate book? Yes; it is sure to be.

How did you get at the quantity of iron that would be required? We took the mean between the end and the commencement; that is the way in which a rough estimate is prepared. We made two estimates—the preliminary and —

At any rate you say you got at the quantity of iron work by taking the mean between the end and the commencement. I suppose you made your calculations for one or two bays at the beginning and end of the jetty, and struck an average? That is so.

How much iron did you calculate upon? I could not say from memory, but on reference to my book I could tell.

*The Umpire* (Sir Henry Ayers): I do not think the matter is one of much importance.

*Mr. Downer*: The arbitrators will, I think, see that the point is material; but I only proposed to put one or two questions on the point. [*To the Witness*]: Have you had any experience in the erection of screw-pile jetties? Not in the erection of screw-pile jetties, which is the simplest form of that kind of work, but I have put up screw-pile lighthouses—one at Barrow-in-Furness and two in Ireland, for which Mr. George Wells tendered. We put that work up ourselves, however.

You say that Mr. Cheesewright prepared the drawings for you for Rivoli Bay Pier? Not exactly.

He prepared the drawings in your office? He prepared the drawing No. 1, which we used.

Did you know at the time that he prepared the drawing No. 1 for Rivoli that he had never been at Rivoli? No; certainly not.

Did he lead you to suppose that he had been there? He said nothing either one way or the other.

How many soundings did he tell you he had taken at Kingston? He did not tell me, and I did not ask him.

So that, without knowing whether he had ever been at Rivoli Bay at all, you took his drawings? I took his drawings without being responsible for them.

And you sent them Home? Yes.

*By Mr. Tomkinson*: Do I understand that Mr. Cheesewright had not been at Rivoli Bay at all? I do not know whether he went to Rivoli Bay or not.

*By Mr. Downer*: Did you make a statement of the wrought-iron that you would require? I never reckoned the exact quantity of iron. I made a rough estimate, but I find it is not here. The way I did it was to say that in the 6,080 feet of the Kingston jetty there would be a certain quantity of iron at so much per foot run.

But your impression is that you did reckon the quantity of iron that would be required? I think I did, but it is not in my book.

Do you know the quantity of iron that was sent out, in fact? No.

Are those your figures [*handing a paper to the Witness*]? Yes.

*By Mr. Symon*: Where did that come from? It appears to have come from my office. It is a pencil document which apparently ought to have been torn up.

Mr. Symon protested against an examination based on a document which was merely a private memorandum belonging to the witness. No notice had been given to produce the paper in question, nor the docketed letters from which quotations had previously been made by his learned friend in the course of the examination of the present witness.

Mr. Downer replied that it was out of place for his learned friend to address the arbitrators on this point at this stage of the case. The documents referred to were in the hands of the claimants, and it had nothing to do with the case how the claimants got them.

Sir William Milne did not see that the documents, however obtained, were in any way relevant to the case.

Mr. Symon said that he must most emphatically protest against a document being produced which was the private property of the witness. He had no information as to how it was obtained, but it appeared to him to be discreditable that the case for the claimants should be conducted on the basis of documents procured apparently without the proper notice to produce being given to his clients.

Mr. Tomkinson did not consider it necessary that the matter should be gone into at this stage of the proceedings.

Mr. Downer said that whenever it became necessary for him to explain he should be happy to show how the documents had been obtained. There was no foundation for the suggestion of his learned friend that the document had been surreptitiously obtained, and therefore there was nothing which his learned friend had a right to describe as being discreditable in the conduct of the case. [*To the Witness*]:—Do you know that 100 tons more iron were required than is set down on this document; it is put down here at 553 tons? I really cannot say; this is an old paper, which is merely a pencil memorandum, and probably one out of half a dozen similar rough estimates.

Sir William Milne was of opinion that time would be merely wasted by examining on such a document as the one in question.

The Umpire (Sir Henry Ayers) concurred in the view taken by Sir William Milne, and did not see how any estimate made by Mr. Hickson for his own guidance would have any effect on the tenderers. It was not information which the tenderers ought to have had. No private memoranda prepared by the witness to assist himself or the Government in arriving at the probable cost could possibly affect the contract.

Mr. Downer urged that the Government were in this case trying to prove that Mr. Cheesewright represented Messrs. Wells Bros. or Mr. George Wells; but Mr. Cheesewright was not acting for his clients, and nothing that took place between Mr. Cheesewright and Mr. Hickson had anything to do with them. Incidentally he wanted to show that Mr. Cheesewright and Mr. Hickson were in the habit of conferring together.

Sir William Milne pointed out that it had not been shown that Messrs. Wells Bros. or Mr. Cheesewright knew anything at all about Mr. Hickson's memoranda, and therefore he really could not see how the paper under discussion had any bearing on the question in dispute.

Mr. Downer said that the witness's contention had been that the contractors had no right to notice the ground-line at all; but the inference to be drawn from the memoranda was that the ground-line must be taken into account.

The Umpire (Sir Henry Ayers) observed that it had been shown that the contractors, in taking out their quantities, took an average from the shore to the pier head. They took the Admiralty soundings and the best information they could otherwise obtain, and, running a certain risk, would take the average for the whole length.

Sir William Milne thought that was very clearly shown by the documents K and E 1.

The Umpire (Sir Henry Ayers) observed that in his opinion both parties to the reference appeared to continue to attach much more importance to Mr. Cheesewright's connection with the matter than it really deserved. It was altogether subsequent to any action of Mr. Cheesewright's that the tenders were sent in.

Sir William Milne said that the same plans which were open to the other tenderers were available for Messrs. Wells Bros., and thus Mr. Cheesewright might be left out of the question altogether for the purposes of the present reference. It appeared to him that they were drifting into matters which had no bearing on the case whatever.

Mr. Tomkinson remarked that the references to Mr. Cheesewright arose out of the statement by the learned counsel for the Crown that the Government always treated Mr. Cheesewright as representing Messrs. Wells Bros., and it appeared to him that Mr. Downer on behalf of the claimants was endeavouring to contradict that view as being a point material to the interests of his clients.

Sir William Milne thought no objection could be raised to the evidence in connection with Mr. Cheesewright relative to the affair, supposing it could be shown that it in any way bore on the case, but that had not been proved.

Mr. Downer would only ask one or two questions on the memorandum, with the permission of the arbitrators, and they would relate to the quantity of wrought iron in the piers.

*To the Witness*: What quantity of wrought-iron did you estimate for Rivoli Bay? 426 tons, and for the Kingston 553 tons; and there would be 100 tons more of cast-iron. I am quoting now from the memorandum you have handed me. Have you ever seen the original tender put in by Messrs. Wells Bros. in England? No; but we have copies.

Sir William Milne said that the tender was superseded by the contract.

Mr. Downer desired to put in a copy of the tender, as he thought it would have some bearing on his case. [*The same was handed in and marked X 1.*]

Mr. Downer then proposed to put in a document which had accompanied the tender, but Mr. Symon objected, and the document was withdrawn.

*Mr. Downer [to the Witness]*: How did you fix high-water mark on the ground? From a few observations which we took.

Did you make any observations personally? No.

The high-water mark was not fixed from any observation of your own? No.

Do you know who took the soundings at Rivoli Bay? There were none taken at Rivoli Bay.

In that drawing, marked No. 2, there are two sections of the wide part, are there not? There are three at Kingston, and one at Rivoli Bay.

Which of those wide parts is the section intended to show? Either of them. They are exactly the same in cross-section.

Were those drawings made rather vague intentionally? No.

Sir William Milne inquired which of the drawings was referred to by the learned counsel.

Mr. Downer said he referred to all the drawings.

Sir William Milne remarked that the evidence showed that the drawing No. 1 was traced from Mr. Cheesewright's drawing.

*Mr. Downer [to the Witness]*: You say that if you had expected that anyone but Messrs. Wells Brothers would have had the contract, more detailed information would have been sent? Yes; if it were to be put to open competition.

The Government intended that it should be put up to open competition, did they not? A few people were invited to tender, certainly.

Mr. Cheesewright's plans were for piers 12 ft. and 17 ft. wide? Yes.

And the contract, as signed, says 10 ft. and 15 ft.? Yes. This plan of ours shows the piers 12 ft. and 17 ft. wide, as Mr. Cheesewright had drawn it. We just traced it off, and did not alter it. It scales to 12 ft. and 17 ft., and, as I say, we just traced his drawing, only altering the figures.

*Re-examined by Mr. Symon*: Do you know how these minutes and reports of yours got into the possession of the claimants? No.

Sir William Milne protested against this matter being gone into at all. The documents might have been obtained in a perfectly regular manner, or they might have been obtained in a way which would throw blame on someone; but, however obtained—even if they were stolen—it was not of the slightest consequence to the arbitrators, in whose opinion the papers were altogether irrelevant to the question at issue.

Mr. Symon only wanted to clear up any difficulty that might exist in reference to the matter, as the examination-in-chief had been partly directed to the documents.

Mr. Tomkinson said that the arbitrators were very desirous of keeping strictly to the points on which they would have to decide, and were of opinion that the papers in question threw no fresh light on the matter.

Mr. Symon said that his object was to rebut any allegations founded upon Mr. Hickson's memoranda or minutes, and if it were necessary to go into that, he could put in the whole of the reports and minutes bearing on the subject, when it would be seen that one qualified the other very materially. However, in deference to the ruling of the arbitrators, he would not go any further into the point.

*To the Witness*: You were asked about Mr. Cheesewright and the payment of his expenses. After his expenses were paid, did he send in a tender dated the 23rd day of November, 1876, on behalf of Messrs. Wells, and marked R 1 in the documents which have been put in? Yes; there was a tender of the 7th of September and the 23rd of November.

What is the document of the 23rd of November? That was a distinct tender.

I understand your explanation of the payment of Mr. Cheesewright's expenses to be, that at the time when there was a talk about inviting other tenderers to send in offers, you thought that it was only fair that he should be paid the expenses which he incurred in going down to get the information which the Government used? Yes.

Did he get paid anything more than his travelling expenses? No.

Did he ever get paid anything for any of his plans, estimates, or tenders? Only his travelling expenses. There was no payment beyond that. These are the items: Fares to and from Kingston, £6; meals, 10s. 6d. The amount of the cheque given to him was £6 10s. 6d.

*By Sir William Milne*: Can you say, of your knowledge and recollection, whether there was any conversation between Mr. Percy Wells and yourself as to Mr. Cheesewright having put in tenders on behalf of the firm? I think it is highly probable that we did have some such conversation, but I really do not recollect specially mentioning the matter to Mr. Percy Wells.

Your

Your never alluded to the amount of the contract in any way? The amount was alluded to afterwards, when Mr. Percy Wells spoke about the amount being different from the London tender. He never repudiated it. On the contrary, Mr. Percy Wells gave an explanation of how it happened that Mr. Cheesewright's tender differed from the one prepared in London. He led me to believe that Mr. Cheesewright's tender would have been binding had the Government accepted it on the spot.

*By Mr. Symon:* The explanation of the difference was that they put in a tender which was lower than Mr. Cheesewright's, because they thought Mr. Cheesewright's tender might have got wind, and they were anxious to secure the work? Yes; and he said that they were able to reduce the item for contingencies.

It appears from Mr. Percy Wells' statement that he knew about all these things when he arrived? Yes.

With reference to that memorandum and those weights of iron of which you have spoken, that document may be one of a great many memoranda which you made for your own guidance? Yes; I know that it must be one of a great many, but whether it is the last or not I cannot say. From the general appearance of it, I should certainly say that it was not the last.

You said that there would be something for cast iron also, I think? There were 553 tons of wrought iron and 100 tons of cast iron.

You have been examined as to a comparison of the two drawings of Cheesewright and the contract drawings. I understand that the contract drawings are drawn from Cheesewright's drawings;—are the differences greater than you would expect in a tracing from a drawing of that scale? No; not when it is considered that they were traced and then lithographed.

You say that at Kingston you gave the starting point to Mr. Cheesewright;—that is the same point as that at which the jetty was ultimately fixed? Yes.

How long were you with him at Kingston;—how long did you remain there when you went down with him? I got there at about 11 or 12 o'clock in the day, and I left there at night about 10 o'clock. I think I went by the mail. I was there about half a day.

You said that you never heard of any question as to Mr. Cheesewright's authority until this dispute;—do you mean this dispute, which is now the subject of this arbitration? Yes.

That was about the beginning of this year? Yes; about the beginning of this. I think that was the first I heard of it.

There is a drawing here showing a straight line from one end of the pier to the other, which, I think, puts in a concrete shape what is deducible from the papers put in as to the way in which the contractors arrived at the lengths of their piles? Yes; this [*producing a drawing*] is a copy of the drawing No. 1. On it I have marked in a red line showing the depths to which the piles ordered by the contractors would come.

It shows that the piles as they go further out do not touch the ground at all? Mr. Tomkinson said that that appeared from the papers that had been put in. The only question was: whose fault was it?

Sir William Milne remarked that the contractors themselves had shown that the piles as ordered by them would not touch the ground, and had said that they were misled by the drawings.

Mr. Downer maintained that the piles, as ordered according to paper F1, were substantially in accordance with the scaling of the drawings.

Sir William Milne did not see how that could be, because the piles shown in papers K and F1 were ordered in regular gradations, increasing in size 2 ft. at a time.

The Umpire (Sir Henry Ayers) said that the evidence of the claimants' own witnesses was that the piles were not ordered from the drawings at all.

Mr. Downer could not admit that. The contractors, not having detailed information, and seeing an almost even gradation, took the ground line as a straight line with a gradual incline.

Sir Henry Ayers said that that was just the point. The contractors took a straight line from the bottom of the pile at the shore end to the bottom of the pile furthest out to sea, and drew a straight line between the two points; and he did not see what other course they could adopt.

Sir William Milne said that practically the drawings were rejected.

Mr. Downer replied that he would take a later opportunity of showing the practical effect of the contract drawings on the contractors' action with regard to the ordering of the piles. He would like, with the arbitrators' permission, to ask a question as to when Messrs. Wells first repudiated Mr. Cheesewright's authority?

*To the witness:* Do you remember, in March, 1877, Mr. Wells showing you a letter from his brother repudiating Mr. Cheesewright's authority? No; I do not.

Here is the letter to which I refer [*handing a document to the witness*]? I really forget it. I may mention that Mr. Percy Wells has shown me a considerable number of letters, very few of which I read. It is a letter from Mr. Cheesewright to Mr. M. C. Davies.

Did he not, in March, 1877, tell you that Mr. Cheesewright had no authority to tender? I do not remember his doing so.

Although I have shown you that letter you say that you cannot recollect the circumstance? No.

[*The letter was put in and marked Y1.*]

There were disputes, were there not, with the Government in reference to Mr. Cheesewright having tendered without authority? Certainly not.

That you positively deny? Yes.

Do you remember Mr. Percy Wells showing you a letter, in August, 1877, from Mr. George Wells, repudiating Mr. Cheesewright's authority to tender? No.

Have you any recollection of the circumstance? Not the slightest.

*Mr. Symon:* That is in March, 1877. The plan you put in, signed by Mr. Cheesewright, as to the Port Adelaide beacons, is dated June, 1877.

*By the Umpire* (Sir Henry Ayers): March, 1877, was after Messrs. Wells had tendered for the Rivoli Bay and Kingston Piers? Yes.

*By Mr. Downer:* The drawing is, however, signed by Mr. Cheesewright, as draftsman? Yes.

[Adjourned to the next day, at 10 o'clock.]

THURSDAY, 25TH SEPTEMBER, 1879.

*Present:*—Mr. R. D. Ross (in the Chair), Commissioner of Public Works (Hon. G. C. Hawker), Hon. L. Glyde, Mr. Bower, Mr. Furner, and Mr. Peacock.

Mr. Thomas Higginbotham, M.I.C.E., further examined:—

Have you inspected the Kingston and Rivoli Bay Jetties? I saw them both on my way here.

Were you specially instructed by the Government to report upon them? The Treasurer asked me to inspect them; but I said I had seen enough of them on my way here to enable me to report, and therefore I thought it would be a waste of time and money to go down there specially.

Will you favour us with your remarks as to the Rivoli Bay Jetty first? The Rivoli Bay Jetty was originally designed to be 4,000 feet long, with a T head 152 feet long. The design for the jetty (I should now say I am speaking from hearsay only) was prepared by Messrs. Wells Brothers, or their agents, who also, as I understand, prepared the estimates. Tenders were called for in London, and Messrs. Wells Brothers obtained the contract, as might have been expected, they being in possession of such special information on the subject as would render any efficient competition impossible. The Treasurer wished me particularly to inquire into the connection of Mr. Hickson, the Engineer of Harbours and Jetties, with the designs for those two works. I have made inquiries as to how far the Engineer of Harbours and Jetties is responsible for the designs, and I confess I do not altogether approve of the course he pursued in the matter. I find that Mr. Hickson, on his arrival here, found the designs prepared, and that Messrs. Wells Brothers had given an estimate of the cost of the construction. Mr. Hickson made some slight alterations in the designs, and arriving without any official experience or knowledge of the way in which such works had been carried on here, he, I think, imprudently signed them. So far he, in some degree, connected himself with the designs and the mode of contracting for work. I think that mode was most objectionable.

objectionable. It should be said, in Mr. Hickson's justification, as regards the course that he followed in the case of the Rivoli Bay and Kingston Jetties, that he found that a similar course had been pursued in the case of the Tiparra Lighthouse. In the case of the Tiparra Lighthouse, Messrs. Wells Brothers had also furnished a design and estimate and got the work at their own price. With regard to the Rivoli Bay and Kingston Jetties, the whole contract ultimately fell through. It became the subject of an investigation by an arbitration. The decision of the arbitrators was entirely in favour of the Government. Subsequently, on communication with the Marine Board, it was determined to reduce the length of the jetties, and Mr. Hickson proposes to use the materials saved in the length to double their previous width for a length of 450 feet from the end of each jetty towards the shore. I believe that will be a very great improvement. The width at the ends will be increased from 15 feet to 30 feet, and the jetties will be efficient, though I should have myself preferred if jarrah timber had been used instead of iron.

What is your opinion with regard to the design? I think that the design was too light. With only 15 feet width at the end, which was at first proposed, I think it would be very likely that the end might be carried away in rough weather.

The object of the Commission is, as I have said, not to blame any particular officer or department of the Government Service, but to inquire into the present working, and ascertain how the works of the Colony may in future be carried out with the greatest economy. For that purpose the Commission are very anxious to obtain your opinion as to the class of jetty which is most suitable? I should have no hesitation in advising that jetties of that description should be in future constructed of jarrah, and not of iron.

Do you think that the design is not sufficiently substantial? No. As far as bearing the weight for which they are designed is concerned, I think there is no danger. I think the jetties of which we are speaking will amply carry the traffic for which they are designed. The danger would have been from ships lying alongside the jetty in rough weather; but that danger will be obviated now by the proposed widening of the jetty which is being carried out.

What is the length of the Sandridge Pier? I do not remember. It has been lengthened so often that I cannot carry the figures in my head.

It is a very long pier, is it not? Yes; it is a very long pier, and it is also very wide.

Does the pier at Sandridge sustain any damage from vessels lying alongside it? I think not; but it is in a very shabby condition owing to the worms having injured it very much.

*By Mr. Peacock:* Do you consider that the practice in the engineering profession is that when an engineer attaches his signature to plans and estimates he is to be taken thoroughly to concur with the method of construction to which those plans and estimates relate? Usually. I should say that that is regarded as the rule, and I think Mr. Hickson was imprudent in attaching his signature to the plans. They were not his plans, and he attached his signature to them without being fully aware of all the circumstances connected with the case. At the same time large allowance must be made for the fact that at the time Mr. Hickson attached his signature to those plans he had had no official experience in this Colony. He did not initiate the system, but he found on arrival in the Colony that a system had been initiated here by which contractors were allowed to prepare their own plans, and then tender for the construction of the work. The contractors were at that time regarded in the light of engineers also.

That is what I particularly wanted to get at. I wanted your opinion whether it was not an exceedingly unwise principle to adopt that the plans for public works carried out by the Government should be initiated by the contractor who, besides executing the work, furnished the drawing and estimates relating thereto? I should certainly characterise that as a most rotten system. It is impossible to condemn it too strongly. But in justice to Mr. Hickson, it is only fair to point out, as I have already done, that he did not initiate the system. He found it in existence on his arrival in the Colony. I think it was wrong in him to acquiesce in it; but no doubt he did so in consequence of finding it already in operation when he came here.

*By the Chairman:* On that point, I should like to say that I was in office at the time, and am fully acquainted with the whole circumstances in connection with the matter, and I do not think that Mr. Hickson was to blame. He was led to infer that Messrs. Wells Brothers, and Messrs. Wells Brothers alone, would have the contract. Just a week or two after I was in office (I am speaking from memory only) a letter was brought to me, covering plans and specifications drawn up by Mr. Cheesewright, to be forwarded to the Agent-General. That letter was drawn up in such a way as to give the work to Messrs. Wells Brothers absolutely. I at once said to the Under Treasurer, Mr. Sheppard, "I cannot sign that letter. The work must be thrown open to tender." Mr. Hickson said he understood that Messrs. Wells Brothers alone were to have the work. To which I replied, "I cannot help what you have understood; I cannot and will not be a party to the work being thrown into the hands of one firm." But I said, "I will go as far as this, that if the tender of Messrs. Wells Brothers should be on a par with any other tender sent in, they shall have the preference." Perhaps that matter will be gone into more fully when Mr. Hickson is examined before the Commission; but I think it only right to make that statement here upon the point. My opinion is, certainly, that contractors should not be permitted to draw up plans and estimates for the work which they are to be employed to construct.

*By Mr. Peacock:* I only wanted to get from you your opinion as to the soundness or unsoundness of the system? Exactly.

*By the Chairman:* Have you any remarks which you would wish to offer with regard to the jetties at Rivoli Bay or Kingston? In the course of my report to the Treasurer I made the following remarks as to the jetties at Rivoli Bay and Kingston.

*By Mr. Peacock:* Have you heard of any settlement in these jetties—any piles having gone down, so as to render the jetty uneven? Yes; I believe some of the piles did not stand the test which Mr. Hickson applied to them.

Do you know whether the Engineer of Harbours and Jetties has taken any steps to remedy this, or whether those defective piles have been allowed to remain in the structure? I understand he had taken steps to remedy it. Some of the piles furnished by Messrs. Wells Brothers were too short. They could not be screwed down to a sufficient depth to stand the weight which was applied to them as a test. In consequence of that the Engineer of Harbours and Jetties took certain steps, which ultimately led to the arbitration. Under the award of the arbitrators, I believe the contractors received no money for work done at those jetties at Rivoli Bay and Kingston. They were simply paid for the materials.

*By Mr. Bower:* In that case I suppose the Government have not sustained any loss on those jetties? I understand that is so.

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REPORT FROM THE PUBLIC WORKS DEPARTMENT OF SOUTH AUSTRALIA FOR THE YEAR ENDED 30 JUNE, 1880.

Appendix No. 2, Page 22.

*Report on Jetties, Wharfs, and Lighthouses, by Mr. Thomas Higginbotham, M.I.C.E., to The Honorable the Treasurer.*

Sir,

Adelaide, 24 September, 1879.

In accordance with your request, I have examined the various works which have been carried out, and which are in progress under Mr. Hickson, the Chief Engineer of Harbours and Jetties, and I beg now to report to you the result of my examination. It has necessarily been general in its character, but I believe that it has been sufficient to enable me to form a correct opinion on the several works.

My first visit was made to Victor Harbour. The works for forming the pier and breakwater have been commenced, and will be in full operation in a short time. I do not propose to offer any remarks on the object with which these works have been undertaken. It has, no doubt, received mature consideration from those who have the means of judging of its importance, which I do not possess; but the design which has been adopted, so far as I could judge of it in a necessarily brief visit, appears to be well calculated to effect the improvement of the harbour, and to give security to vessels trading there.

I visited Coolwa, where the wharf has been much improved by lengthening and bringing it into line. The new approaches to this wharf, which are being made by the Railway Department, will greatly facilitate access to it.

I have also made an inspection of the Marine Yard at Port Adelaide, the Dredgers, and the new beacons which are lighted with gas for the purpose of making the port accessible at night.

It will, I think, be interesting and useful if I furnish you briefly with a few facts which show what has been accomplished in improving Port Adelaide by dredging since January, 1877, when Mr. Hickson, the Chief Engineer of Harbours, took charge of the works.

The quantity of material raised by dredging since that date is 1,014,000 cubic yards, and this has been either discharged on shore for the Port Adelaide Corporation and other municipal bodies, who have employed it in reclaiming or improving land, or sent out to sea.

Previously to January, 1877, there was a depth of water of only 14 feet on the outer bar at low water of spring tides. The dredging operations have formed a channel through this bar 250 feet wide, with a depth of 20 feet at low-water springs. In addition, several places in the port itself, which formerly had depths varying from 9 to 15 feet, have now a uniform depth of 20 feet at low-water springs.

Before the date which I have mentioned, the capacity of the dredgers employed was 50,000 cubic yards per annum for No. 1 dredger, and 40,000 cubic yards for No. 2, and the cost of their work, as nearly as it could be arrived at, was 4s. 1d. per cubic yard, including landing the silt, which cost about 1s. 3d. per cubic yard. The "Willunga" dredger, which was ordered by the Marine Board, has been employed till within the last few months on the outer bar. The material dredged there is sand, and it has to be conveyed about 2 miles only. She has, therefore, been working under very favourable circumstances. Her power is about 200,000 cubic yards per annum, in material such as she has been working in, and the cost of raising has been 9½d., and depositing 3½d., per cubic yard. This dredger would not be so successful in hard clay, either in the quantity or cost of work done. Her price delivered here was £35,000.

The dredger "Wallaroo" was built from the design of the Harbour Engineer, and cost, delivered here, nearly £26,000. Her dredging capacity when she has her full complement of barges, which are being supplied, will be about 350,000 cubic yards per annum, and from the results which have been obtained hitherto in the hard material in which she has been working, there appears to be good reason to believe that the cost of her work will not exceed 10d. per cubic yard for raising and depositing.

I have thought it worth while to give prominence to these facts, which show the great advance that has been made in less than three years in providing the machinery for improving the port, in effecting these improvements, and in reducing the cost at which they are made, when buried in the mass of official documents such facts seldom receive the amount of attention which they deserve.

The first cost of the twelve new beacons, which are lighted with gas, has been £9,300. The practicability of lighting with gas has been proved, and the annual cost of doing so will not exceed £25 per beacon, or (say) £300 a year for the twelve beacons. This estimate has been arrived at from the actual consumption of gas up to this time.

The growing importance of Port Adelaide would probably have made the lighting of the channel at night a work of necessity in a few years. There may be differences of opinion as to the present necessity for the work. I do not feel that I have sufficient knowledge of the requirements of the trade of the port to justify me in offering an opinion on this point.

I made an inspection, accompanied by Mr. Hickson, of various jetties on the coasts of St. Vincent's Gulf and Spencer's Gulf, and visited also the Althorpe and Tippara lighthouses, Wallaroo Bay and Port Pirie.

The design of the jetties is a plain and good one, and is that which is commonly used. The same design, practically, has been used in all the jetties which I saw. The piles are of jarrah timber, which the worm does not attack when the quality of the timber is good, and those which I saw were perfectly clean and sound. In many of the jetties, bluegum (or what is believed to be bluegum) timber has been used in the decks or floors, and also in the corbels, kerbs, and rail-bearers. As this timber is scarce, and very difficult to identify, I have suggested to Mr. Hickson not to specify it in future for any of the works under his control.

On almost all the jetties which I saw, the railway is made by screwing an iron plate to a longitudinal wooden sleeper. This plan has been adopted for the sake of economy, but I think it is a mistake. A light iron rail would not have cost much more in the first instance, and would be much cheaper to maintain, while the traction would be much lighter. Several of the jetties would be much improved by a small additional expenditure in metallating the approaches, and widening them to allow bullock-teams to turn.

I have heard it remarked that the sites of many of the jetties have been badly chosen. The statement was made generally, and I do not recollect any particular instance having been given. Such statements ought to be taken with much reserve, because each person whose interest has not been consulted is ready to believe that a site which does not suit him must be a bad one. I could not, with the time at my disposal, form any opinion as to whether there were any sufficient grounds to justify such a statement as I have referred to, but from the way in which the sites for these works are chosen, it would not be surprising if mistakes were made.

Another objection which is made to the jetties is that they are too narrow, but as produce and goods are conveyed along them in trucks on a line of railway, this objection does not appear to me to have any force; and it should be borne in mind that the cost of the jetties is almost proportional to their width. If they were made twice as wide they would cost nearly twice as much.

The jetties at Rivoli Bay and Kingston are different to those to which I have been referring, and as I do not think that they are in any way an improvement on these, I have made inquiry to ascertain who is responsible for the design on which these two jetties have been built. I find that Messrs. Wells Brothers designed them, and also contracted to build them, at practically their own prices, as, although tenders were called for in London, Messrs. Wells Brothers having made the designs, and possessing full knowledge of the locality and other circumstances affecting the cost of the works, were in a position to make effective competition impossible.

This firm had previously contracted for the Tippara lighthouse, under very similar circumstances, having furnished the design and estimate of cost, and become contractors for the work at their own price.

Mr. Hickson found this state of things existing when he arrived here; he was not responsible for its initiation, and had no official experience at that time to enable him to judge how far it might be necessary in the circumstances of the Colony. It appears to me, therefore, that he can only be accused of imprudence in having signed the plans for the jetties at Rivoli Bay and Kingston, which he found already prepared. By doing so, he connected himself in some degree with a most objectionable system which had been initiated by others, who have escaped from all responsibility in connection with it.

The determination to reduce the length of these two jetties, and to employ the material which is saved by doing so in widening the ends of the jetties from 15 feet to 30 feet for a length of 450 feet, is, I am sure, a wise one, as it will make them stiffer and better adapted for the purpose they have to serve than they would have been if the original design had been followed.

I examined the wharf at Morgan in connection with the inspection of the Government lines of railway, which I was requested to make by the Honorable the Commissioner of Public Works, and have reported to him that, in my opinion, the wharf has been built at the proper level; that it is efficient for its intended purpose, closely resembling as it does the railway wharf at Echuca, where for many years a very large business has been carried on both successfully and economically.

There was a slight defect in the design of the cranes, but this has been corrected, and I understand that they are now working most satisfactorily. The cost of remedying the defect in the four cranes has been £40.

The Althorpe and Tippara lighthouses are both very fine works. The former was designed and built by the Engineer of Harbours and Jetties. The contract for the latter was let before he arrived here, and was carried out under his supervision. He has made some additions to the original design, which, though matters of detail, add considerably to the safety and convenience of the lighthouse-keepers and their families. In the case of the Althorpe lighthouse, Mr. Hickson's estimate was exceeded by £2,500. This arose from the addition of a jetty, which was not included in the original estimate, and from the difficulty of procuring a supply of water for the works and the men who were employed on them, which made it necessary to bring the whole of the water from Port Adelaide. The cost of the lighthouse and three good cottages for the use of the men and their families has been £11,700. This does not appear to me a large sum when it is borne in mind that the work is of the first class, and was carried out under exceptionally difficult circumstances. The cost of the Tippara lighthouse was £30,900, including the purchase of a house on shore for the men off duty and their families. Valuable work has been done at Port Wakefield, where a wharf 1,000 feet long has been built, and the material, which has been raised by dredging, has been deposited behind it. Half of this wharf is built of jarrah and half of ironbark timber. The latter has, I understand, been used for the purpose of experiment, to ascertain if the worm will attack it.

At Port Pirie a large amount of dredging has been done, and the work is still in active progress. The dredge "Sarnia," which was built here under Mr. Hickson's supervision, is employed, and has been very successful. Her dredging capacity is about 150,000 cubic yards per annum, and the cost of raising and landing the silt is a fraction more than 1s. 5½d. per cubic yard. A considerable area, which was previously useless, has been raised to the level of the wharfs, and is now of great value. It is very much to be regretted that here, as at so many other ports, the frontages to the



the water have been allowed to pass into private hands, and individuals reap the benefit of the great improvements which are being made at the public expense. At Port Pirie a satisfactory alignment of the wharfs is impossible under present circumstances, though it is of the greatest importance. The railway lines are carried along the main street, where they are a nuisance, instead of along a line of wharfs, where they are required, and ought to be. At the Queen's Wharf, where the frontage to the water remains in the hands of the Government, it is impossible to connect with the lines of railway, except by using very sharp, and, therefore, most objectionable curves. I would beg to suggest for your consideration, if it would not be advisable to make an attempt to recover the frontage to the water at this port, for a depth of 100 or 150 feet. The improvements which might be effected, if this were done, would add greatly to the value of property at Port Pirie, and without these, the business—which is already a very large one, and will not fail to increase—cannot be done, either with dispatch or economy.

The anomalous position which the Engineer for Harbours and Jetties holds has necessarily forced itself on my attention in the course of the examination which you directed me to make into the works under his charge.

The Marine Board, which appears to be practically irresponsible, claims in a correspondence which took place in 1876 with the Under Treasurer, and which is printed—that the “sites, directions, and extent of all the jetties, position and character of all lighthouses, in short, in all works, whether buoys, beacons, or other shall emanate from the Board.” These wide claims are, I understand, enforced, and the President of the Marine Board proceeds, without consultation with the Engineer of Harbours or reference to him, to fix the sites of jetties and other works, which are then communicated to the Engineer of Harbours, and he examines separately the correctness of the information given to him by the President. It is evident that this mode of proceeding involved not only great waste of time and money, but, what is more serious, divided responsibility. If a mistake is made in choosing a site for a jetty or in determining its direction or extent, the Treasurer cannot hold the Engineer of Harbours and Jetties responsible, because all these particulars have been decided by the Marine Board, which, as I have already said, appears to be practically irresponsible, and I would beg leave to suggest for your consideration that the Engineer for Harbours and Jetties should be made independent of the Marine Board, and be placed under the Commissioner of Public Works, to whom he would be solely and directly responsible.

The sites of wharfs, lighthouses, and jetties, and the extent, direction, width and levels of the jetties, should be fixed by the Engineer of Harbours and the President of the Marine Board, both being officers of the Government, in consultation, after a general survey, and be made in each case the subject of a joint written report to the Minister, who would decide any matter on which the officers could not agree. To carry out this view would probably require an alteration of the Marine Board Act, and a more accurate definition of the functions of the Board.

I have, &c.,

T. HIGGINBOTHAM.

The Hon. Charles Mann, M.P., Treasurer.

### Appendix No. 64.

Department of Public Works, Roads and Bridges and Sewerage Branch.

#### TENDER FORM.

IN pursuance of advertisement in the *Government Gazette* we, the undersigned, do hereby tender to provide the material and perform the various works required in and about the full and proper manufacture, completion, and delivery at the sites described in the specification of wrought-iron work, gun-metal work, and cast-iron work for the sewerage works in course of construction in Sydney and suburbs (Contract No. 93), agreeably to the plans, specification, schedule to specification, and general conditions, which have been inspected by us, at 30 per cent. below the prices affixed to each item, and to complete the same within twenty-four months from the date of the acceptance of this tender; and we do hereby agree that any additions to or deductions from the said works shall be paid or allowed for, as the case may be, at and after the rates quoted above, or, if not in schedule, at a price to be agreed upon at the time, and we hereby undertake that we will, within fourteen days from the date of notification of the acceptance of the said tender, execute and deliver to the Minister for Public Works a valid legal contract with Her Majesty the Queen, embodying the terms and conditions above mentioned, and to provide the security required by clause 29 of the said general conditions; and we enclose herewith our cheque for the sum of £31 as a preliminary deposit; and we agree that such sum shall be absolutely forfeited if we at any time within thirty days after the said tender is opened withdraw same, or if, in the event of this tender being accepted, we fail to complete the above-mentioned contract within fourteen days thereafter; and further, that this tender is made subject to the conditions contained in the Tender Board Regulations printed on the back hereof, and by which we agree to be bound.

Dated this 28th March, 1894.

COOKE AND WEBB,  
Cleveland-street, Redfern.

Witness—N. C. MAIR.

#### *Tender Board Regulations.*

No tender shall be received after 11 a.m. on the day named for the receipt of such tender, unless there are circumstances which, in the opinion of the Members of the Board then sitting, render it desirable to do so.

It shall be the duty of the President, Vice-President, or the senior member present, as the case may be, as soon as the tenders shall have been opened and the necessary particulars ascertained, to publicly announce the number of tenders received for each work and the name of the lowest tenderer; but no tender shall be accepted until the Head of the Branch, under whose directions the work is to be carried out, has reported upon the whole of the tenders received.

The Secretary shall, as soon as practicable after the Board has adjourned, exhibit in a conspicuous position in the Public Works Office a full statement of the tenders received, showing the work, the name of the tenderer, and the amount of each tender.

All envelopes containing tenders must be addressed to the President of the Board, and have legibly endorsed upon them the name of the work for which the tender is submitted.

Every tender must, as a guarantee of good faith, be accompanied by a preliminary deposit, calculated according to the following scale, viz. :—

|   |         |
|---|---------|
| For amounts up to £500 inclusive .....                    | £5 0 0  |
| For amounts exceeding £500 and not exceeding £1,000 ..... | £10 0 0 |

For all sums over £1,000, 1 per cent. on the amount of tender up to a maximum deposit of £500. Such deposit to be in the form of a cheque in favour of the President of the Board, endorsed by the manager of the bank upon which it is drawn, or a bank draft.

All deposits, with the exception of that of the successful tenderer, shall be returned by the Secretary to the person entitled thereto as soon as possible after the Board shall have adjourned, and the deposit made by the successful tenderer shall be returned to him on his executing the bond for the fulfilment of the contract. When the contract is for a less sum than £200 the deposit with tender shall not be returnable until the service is satisfactorily completed.

Any tender which may be received without such preliminary deposit shall, unless otherwise directed by the Board, be deemed to be informal, and rejected accordingly.

In the event of any tenderer failing to take up his tender, complete the bond, and proceed with the contract within the time specified, or withdrawing his tender after it shall have been opened, whether such tender shall have been accepted or not, all moneys deposited by him on account thereof or in connection therewith shall be forfeited to the Crown, and in such case be paid to the credit of the Consolidated Revenue of the Colony.

Whenever a tenderer shall fail to proceed with a contract as aforesaid, fresh tenders shall be invited at short notice for the work, unless, in the opinion of the President, there are circumstances which make it desirable for another tender in the same series to be accepted; but the tenderer by whose default such a course has been rendered necessary shall be excluded from the competition, and from any competition for other works, at the pleasure of the President.

In the event of any contract being tendered for at a schedule of rates, the approximate quantities as given of each item must be worked out and a total sum shown.

In submitting a tender the full Christian name of the tenderer must be given, or, when the offer is in the name of a firm, the names in full of each member. When bondsmen are required, the names in full, occupations, and addresses must be stated in the tender. The omission of this information will render the tender liable to be declared informal.

The Board shall not be bound to accept the lowest or any tender.

The Board-room shall be open for the admission of the public while the tenders are being opened and declared.

Contract



Contract No. 93.—This is the Schedule of Quantities and Prices hereinbefore referred to.

| No. of Item on Drawing. | No. of Item. | Description of Work.  | Unit. | Probable Quantity. | Rate per Unit.    | Amount.            |
|-------------------------|--------------|---|-------|--------------------|-------------------|--------------------|
| 1                       | 1            | Cast-iron ventilating grate with square frame, 22 in. diameter internal opening, tarred sawn hardwood bricks in centre, fitted into panels, circular dirt-box 8 in. deep, complete, as shown on Drawing, weighing in all 9 cwt. 0 qr. 23 lb. ....                                     | each  | 31                 | £ s. d.<br>5 15 0 | £ s. d.<br>178 5 0 |
| 8                       | 2            | Cast-iron circular ventilating grate only for 22 in. diameter opening, with wood bricks fitted into panels, as described under Item 1, without the frame and dirt-box, complete, as shown on Drawing, weighing in all 2 cwt. 2 qrs. 10 lb. ....                                       | "     | 3                  | 1 13 0            | 4 19 0             |
| 6                       | 3            | Cast-iron square frame, with 22 in. diameter internal opening, and closed circular manhole cover, with tarred sawn hardwood bricks, fitted into panels, as shown on Drawing, weighing in all 7 cwt. 0 qr. 24 lb. ....   | "     | 247                | 5 15 0            | 1,420 5 0          |
| 7                       | 4            | Cast-iron circular closed manhole cover only for 22 in. diameter opening, with wood bricks fitted into panels, as described under Item 3, without the frame complete, as shown on Drawing, weighing in all 2 cwt. 1 qr. 22 lb. ....   | "     | 3                  | 2 4 0             | 6 12 0             |
| 164                     | 5            | Cast-iron square frame, with 13½ in. diameter internal opening, and closed circular cover for pipe shaft, complete, as shown on Drawing, weighing in all 2 cwt. 3 qrs. 23 lb. ....  | "     | 40                 | 2 0 0             | 80 0 0             |
| 4                       | 6            | Cast-iron square 4 ft. 6 in. x 4 ft. 6 in. frame over stop-board and manhole chamber in low ground, with 22 in. diameter internal opening, and closed manhole cover, with tarred sawn hardwood bricks fitted into panels, complete, as shown on Drawing, weighing in all 12 cwt. .... | "     | 6                  | 9 10 0            | 57 0 0             |
| 112                     | 7            | Cast-iron 5 ft. x 2 ft. 8½ in. frame, over-flushing chamber, with 22 in. diameter internal opening, closed circular manhole cover, with sawn hardwood tarred bricks fitted into panels, complete, as shown on Drawing, weighing in all 9 cwt. 2 qrs. 15 lb. ....                      | "     | 1                  | 11 0 0            | 11 0 0             |
| 111                     | 8            | Cast-iron automatic flushing syphon, with ejector, gearing, two-way cock, regulating cistern, ballcocks, galvanized wrought-iron pipe, key, &c., complete, with all gun-metal and wrought-iron work, as shown on Drawing, weighing in all 10 cwt. 1 qr. 25 lb. ....                   | "     | 1                  | 49 0 0            | 49 0 0             |
| 161 }<br>162 }          | 9            | Cast-iron bell-mouth pipe and 24 in. diameter bend for water-cushion in deep shafts, with air-escape pipe, complete, as shown on Drawing, weighing in all 9 cwt. 1 qr. 9 lb. ....   | "     | 6                  | 10 5 0            | 61 10 0            |
| 89                      | 10           | Cast-iron 3 ft. 6 in. x 18 in. landing plate, weighing 1 cwt. 3 qrs. 20 lb. ....  | "     | 17                 | 1 10 0            | 25 10 0            |
| 83                      | 11           | Cast-iron frame and gully grating of 35½ in. by 17½ in., as shown on Drawing, weighing 5 cwt. 2 qrs. 2½ lb. ....  | "     | 2                  | 2 10 0            | 5 0 0              |
| 84                      | 12           | Cast-iron frame and gully grating of 25 in. x 19 in., as shown on Drawing, weighing 3 cwt. 0 qr. 14½ lb. ....   | "     | 49                 | 2 0 0             | 98 0 0             |
| 11                      | 13           | Cast-iron saddle, with socket for 12 in. diameter ventilating pipe shaft, as shown on Drawing, weighing 2 cwt. 1 qr. 23 lb. ....  | "     | 31                 | 1 15 0            | 54 5 0             |
| 150                     | 14           | Cast-iron offset valve, with 6 in. diameter internal opening, frame and offset pipe, lifting gear, street box, and all wrought-iron and gun-metal work, complete, as shown on Drawing, weighing in all 3 cwt. 1 qr. 2 lb. ....  | "     | 1                  | 8 5 0             | 8 5 0              |
| 21                      | 15           | Cast-iron frame, with muntz-metal gas-check for 12 in. diameter sewer, complete, as shown on Drawing, weighing in all 1 cwt. 1 qr. 25 lb. ....  | "     | 6                  | 5 10 0            | 33 0 0             |
| 165                     | 16           | Cast-iron frame, with muntz-metal gas-check for 15 in. diameter sewer, complete, as shown on Drawing, weighing in all 2 cwt. 0 qr. 13 lb. ....  | "     | 5                  | 6 5 0             | 31 5 0             |
| 22                      | 17           | Cast-iron frame, with muntz-metal gas-check for 16 in. diameter sewer, complete, as shown on Drawing, weighing in all 2 cwt. 0 qr. 25 lb. ....  | "     | 2                  | 6 15 0            | 13 10 0            |
| 23                      | 18           | Cast-iron frame, with muntz-metal gas-check for 18 in. diameter sewer, complete, as shown on Drawing, weighing in all 3 cwt. 0 qr. 26 lb. ....  | "     | 3                  | 8 5 0             | 24 15 0            |
| 24                      | 19           | Cast-iron frame, with muntz-metal gas-check for 21 in. diameter sewer, complete, with all gun-metal work, as shown on Drawing, weighing in all 3 cwt. 2 qrs. 27 lb. ....  | "     | 3                  | 9 15 0            | 29 5 0             |
| 25                      | 20           | Cast-iron frame and muntz-metal gas-check for sewer of 24 in. internal diameter, with all gun-metal work, &c., complete, as shown on Drawing, weighing in all 4 cwt. 1 qr. 18 lb. ....  | "     | 3                  | 11 5 0            | 33 15 0            |
| 26                      | 21           | Cast-iron frame, with muntz-metal gas-check for sewer of 3 ft. 3 in. x 2 ft. 2 in., complete, with all gun-metal work, anchor-bolt, &c., as shown on Drawing, weighing in all 4 cwt. 2 qrs. 12 lb. ....   | "     | 1                  | 12 10 0           | 12 10 0            |
| 101                     | 22           | Cast-iron frame, with muntz-metal gas-check for sewer of 4 ft. x 2 ft. 8 in., complete, with all gun-metal work, anchor-bolts, &c., as shown on Drawing, weighing in all 6 cwt. 1 qr. 16 lb. ....   | "     | 1                  | 16 0 0            | 16 0 0             |
| 100                     | 23           | Cast-iron frame, with muntz-metal gas-check for sewer of 4 ft. x 3 ft., complete, with all gun-metal work, anchor-bolts, &c., as shown on Drawing, weighing in all 6 cwt. 1 qr. 27 lb. ....   | "     | 1                  | 17 0 0            | 17 0 0             |
| 99                      | 24           | Cast-iron frame, with muntz-metal gas-check for sewer of 4 ft. 3 in. x 3 ft. 3 in., complete, with all gun-metal work, anchor-bolts, &c., as shown on Drawing, weighing in all 7 cwt. 2 qrs. 6 lb. ....   | "     | 1                  | 22 0 0            | 22 0 0             |
| 27                      | 25           | Cast-iron frame and muntz-metal gas-check for sewer of 4 ft. 6 in. x 3 ft. 6 in., complete, with all gun-metal work, anchor-bolts, &c., as shown on Drawing, weighing in all 8 cwt. 0 qr. 5 lb. ....  | "     | 1                  | 24 0 0            | 24 0 0             |
| 28                      | 26           | Cast-iron frame, with muntz-metal gas-check for sewer, 4 ft. 9 in. x 3 ft. 9 in., complete, with all gun-metal work, anchor-bolts, &c., as shown on Drawing, weighing in all 9 cwt. 0 qr. 4 lb. ....  | "     | 1                  | 27 0 0            | 27 0 0             |
| 98                      | 27           | Cast-iron frame and muntz-metal gas-check for sewer, of 5 ft. x 4 ft., complete, with all gun-metal work, anchor-bolts, &c., as shown on Drawing, weighing in all 11 cwt. 3 qrs. 24 lb. ....  | "     | 1                  | 32 0 0            | 32 0 0             |
| 25                      | 28           | Cast-iron frame, with brackets (the same as in item 20) for gas-check for 24-in. diameter pipe-sewer, but without muntz-metal flap and gun-metal work, weighing in all 4 cwt. 0 qr. 25 lb. ....   | "     | 1                  | 9 5 0             | 9 0 0              |

| No of Item on Drawing | No of Item | Description of Work   | Unit | Probable Quantity | Rate per Unit | Amount  |
|-----------------------|------------|---|------|-------------------|---------------|---------|
|                       |            |   |      |                   | £ s d         | £ s d   |
| 26                    | 29         | Cast iron frame, with cast iron and gun metal hinge brackets set screws, screw bolts and nuts, and wrought iron anchor bolt (the same as in item 21) for gas check for sewer of 3 ft 3 in x 2 ft 2 in, but without muntz metal flap and gun metal fittings weighing in all 4 cwt 0 qr 4 lb    | each | 10                | 8 5 0         | 82 10 0 |
| 101                   | 30         | Cast iron frame, with cast iron and gun metal hinge brackets set screws screw bolts and nuts, and wrought iron anchor bolts (the same as in item 22) for gas check for sewer of 4 ft x 2 ft 8 in, but without muntz metal flap and gun metal fittings, weighing in all 5 cwt 3 qrs 17 lb      | "    | 2                 | 11 5 0        | 22 10 0 |
| 100                   | 31         | Cast iron frame, with cast iron and gun metal hinge brackets, set screws, screw bolts and nuts, and wrought iron anchor bolts (the same as in item 23) for gas check for sewer of 4 ft x 3 ft, but without muntz metal flap and gun metal fittings, weighing in all 5 cwt 3 qrs 23 lb         | "    | 1                 | 12 10 0       | 12 10 0 |
| 99                    | 32         | Cast iron frame, with cast iron and gun metal hinge brackets, set screws, screw bolts and nuts, and wrought iron anchor bolts (the same as in item 24) for gas check for sewer of 4 ft 3 in x 3 ft 3 in, but without muntz metal flap and gun metal fittings, weighing in all 7 cwt           | "    | 1                 | 16 10 0       | 16 10 0 |
| 27                    | 33         | Cast iron frame with cast iron and gun metal hinge brackets set screws, screw bolts and nuts, and wrought iron anchor bolts (the same as in item 25) for gas check for sewer of 4 ft 6 in x 3 ft 6 in, but without muntz metal flap and gun metal fittings weighing in all 7 cwt 1 qr 4 lb    | "    | 1                 | 18 0 0        | 18 0 0  |
| 28                    | 34         | Cast iron frame, with cast iron and gun metal hinge brackets, set screws, screw bolts and nuts, and wrought iron anchor bolts (the same as in item 26) for gas check for sewer of 4 ft 9 in x 3 ft 9 in, but without muntz metal flap and gun metal fittings weighing in all 8 cwt 0 qr 22 lb | "    | 1                 | 19 0 0        | 19 0 0  |
| 98                    | 35         | Cast iron frame, with cast iron and gun metal hinge brackets, set screws, screw bolts and nuts, and wrought iron anchor bolts (the same as in item 27) for gas check for sewer of 5 ft x 4 ft, but without muntz metal flap and gun metal fittings, weighing in all 10 cwt 2 qrs 13 lb        | "    | 1                 | 24 0 0        | 24 0 0  |
| 131                   | 36         | Cast iron socket pipe frame of 9 in diameter internal opening, with brackets, flushing flap, gun metal hinge pin and $\frac{1}{16}$ in wrought iron galvanized chain, 12 ft long, provided with two rings and hook, complete, as shown on Drawing, weighing in all 1 cwt 1 qr 0 lb            | "    | 10                | 4 5 0         | 42 10 0 |
| 130                   | 37         | Cast iron bracket with pulley, gun metal bushes, set screw, copper pin, wrought iron hinge pin, and anchor bolts for flushing flap, complete, as shown on Drawing, weighing 1 qr 4 lb   | "    | 3                 | 1 5 0         | 3 15 0  |
| 29                    | 38         | Cast iron groove and stop plate for sewer of 9 in diameter, with wrought iron galvanized $\frac{1}{16}$ in link 12 ft chain, two $2\frac{1}{2}$ in diameter rings of $\frac{1}{4}$ in round iron and hook, complete, weighing in all 2 qrs 7 lb   | "    | 3                 | 0 15 0        | 2 5 0   |
| 30                    | 39         | Cast iron groove and stop plate for sewer of 12 in diameter, complete, with chains, ring, and hook, as before, weighing in all 3 qrs  | "    | 3                 | 1 5 0         | 3 15 0  |
| 104                   | 40         | Cast iron 6 in x 5 in L girders, varying from 2 ft to 6 ft in length, as may be ordered, as shown on Drawing, weighing 30 lb per lineal foot  | cwt  | 43                | 0 12 0        | 25 6 0  |
| 51                    | 41         | Wrought iron galvanized step iron, as shown on Drawing, weighing 6 lb   | each | 3,200             | 0 2 3         | 360 0 0 |
| 49                    | 42         | Cast iron spigot and faucet pipe of 9 in diameter, 9 ft long in the body, $\frac{1}{2}$ in thick in metal, weighing in all 4 cwt 0 qr 14 lb   | "    | 6                 | 3 2 0         | 18 12 0 |
| 49                    | 43         | Cast iron spigot and faucet pipe of 9 in diameter, 12 ft long in the body, $\frac{1}{2}$ in thick in metal, weighing 4 cwt 2 qrs 12 lb  | "    | 1                 | 3 10 0        | 3 10 0  |
| 49                    | 44         | Cast iron spigot and faucet pipe of 9 in diameter, $\frac{1}{2}$ in thick in metal, varying in length from 2 ft to 11 ft 6 in, as may be ordered, and as shown on Drawing   | cwt  | 48                | 1 0 0         | 48 0 0  |
|                       |            | Cast iron flange and spigot pipe of 9 in diameter, $\frac{1}{2}$ in thick in metal, of the following lengths and weights, as viz —  |      |                   |               |         |
| 62                    | 45         | 9 ft 6 in long, weighing 4 cwt 0 qrs 11 lb  | each | 1                 | 3 0 0         | 3 0 0   |
| 63                    | 46         | 9 ft long, weighing 3 cwt 3 qrs 16 lb   | "    | 1                 | 3 0 0         | 3 0 0   |
| 64                    | 47         | 8 ft long, weighing 3 cwt 0 qrs 26 lb   | "    | 1                 | 2 15 0        | 2 15 0  |
| 65                    | 48         | 6 ft long, weighing 2 cwt 2 qrs 18 lb   | "    | 1                 | 2 10 0        | 2 10 0  |
| 66                    | 49         | 4 ft long, weighing 1 cwt 3 qrs 10 lb   | "    | 1                 | 2 5 0         | 2 5 0   |
| 67                    | 50         | 3 ft 6 in long, weighing 1 cwt 2 qrs 15 lb  | "    | 1                 | 2 2 0         | 2 2 0   |
| 68                    | 51         | 2 ft 6 in long, weighing 1 cwt 0 qr 25 lb   | "    | 1                 | 1 10 0        | 1 10 0  |
| 69                    | 52         | 2 ft long, weighing 1 cwt 0 qr 2 lb   | "    | 1                 | 1 7 6         | 1 7 6   |
| 73                    | 53         | Cast iron flange and spigot 9 in diameter bent pipe, as shown on Drawing, and with the spigot end of varying length, as may be ordered  | cwt  | 13 11             | 0 14 0        | 8 15 0  |
| 74                    | 54         | Cast iron flange and spigot 9 in diameter bent pipe, as shown on Drawing and with the spigot end of varying length, as may be ordered   | "    | 4 7               | 0 14 0        | 3 0 0   |
| 79                    | 55         | Cast iron flange and spigot S bent pipe of 9 in diameter, as shown on Drawing, weighing 1 cwt 3 qrs 27 lb   | each | 6                 | 3 0 0         | 18 0 0  |
| 87                    | 56         | Cast iron flange and spigot 9 in diameter S bent pipe, as shown on Drawing, weighing 2 cwt 2 qrs 18 lb  | "    | 24                | 4 5 0         | 102 0 0 |
| 151                   | 57         | Cast iron flange and spigot 9 in diameter bent pipe, as shown on Drawing, with a straight length A = 3 ft $3\frac{3}{8}$ in, weighing 1 cwt 3 qrs 27 lb   | "    | 4                 | 3 0 0         | 12 0 0  |
| 152                   | 58         | Cast iron flange and spigot 9 in diameter bent pipe, as shown on Drawing, with a straight length A = 1 ft $3\frac{3}{8}$ in, weighing 1 cwt 0 qr 19 lb  | "    | 4                 | 2 0 0         | 8 0 0   |
| 153                   | 59         | Cast iron flange and spigot 9 in diameter bent pipe, as shown on Drawing, with a straight length A = 4 ft $9\frac{1}{2}$ in, weighing 2 cwt 3 qrs 20 lb   | "    | 4                 | 4 5 0         | 17 0 0  |
| 154                   | 60         | Cast iron flange and spigot 9 in diameter bent pipe, as shown on Drawing, with a straight length A = 1 ft $11\frac{3}{8}$ in, weighing 1 cwt 1 qr 22 lb   | "    | 4                 | 2 5 0         | 9 0 0   |

| No. of Item on Drawing.     | No. of Item. | Description of Work.   | Unit. | Probable Quantity. | Rate per Unit.    | Amount.            |
|-----------------------------|--------------|--|-------|--------------------|-------------------|--------------------|
| 155                         | 61           | Cast-iron spigot and flange 9 in. diameter bent pipe, as shown on Drawing, with a straight length A = 3 ft. 11½ in., weighing 2 cwt. 2 qrs. 7 lb. ....                 | each  | 4                  | £ s. d.<br>3 17 6 | £ s. d.<br>15 10 0 |
| 70                          | 62           | Cast-iron spigot and faucet 9 in. diameter bent pipe, as shown on Drawing, and with the spigot end of varying length, as may be ordered .....                          | cwt.  | 20.5               | 1 10 0            | 30 15 0            |
| 71                          | 63           | Cast-iron spigot and faucet 9 in. diameter bent pipe, as shown on Drawing, and with the spigot end of varying length, as may be ordered .....                          | „     | 14.5               | 1 10 0            | 21 15 0            |
| 72                          | 64           | Cast-iron spigot and faucet 9 in. diameter bent pipe, as shown on Drawing, and with the spigot end of varying length, as may be ordered .....                          | „     | 7.25               | 1 10 0            | 10 17 6            |
| 85                          | 65           | Cast-iron spigot and faucet 9 in. diameter bent pipe, as shown on Drawing, weighing 1 cwt. 1 qr. 24 lb. ....   | each  | 1                  | 2 5 0             | 2 5 0              |
| 156                         | 66           | Cast-iron spigot and faucet 9 in. diameter bent pipe, as shown on Drawing, weighing 1 cwt. 0 qr. 7 lb. ....  | „     | 15                 | 1 6 0             | 20 10 0            |
| 157                         | 67           | Cast-iron spigot and faucet 9 in. diameter bent pipe, as shown on Drawing, weighing 1 cwt. 1 qr. 6 lb. ....  | „     | 3                  | 2 0 0             | 6 0 0              |
| 158                         | 68           | Cast-iron spigot and faucet 9 in. diameter bent pipe, as shown on Drawing, weighing 1 cwt. 2 qrs. 1 lb. ....   | „     | 6                  | 2 5 0             | 13 10 0            |
| 159                         | 69           | Cast-iron spigot and faucet 9 in. diameter bent pipe, as shown on Drawing, weighing 1 cwt. 1 qr. 23 lb. ....   | „     | 3                  | 2 5 0             | 6 15 0             |
| 160                         | 70           | Cast-iron 9 in. diameter junction, with two faucets and one spigot end, as shown on Drawing, weighing 2 cwt. 2 qrs. 10 lb. ....  | „     | 3                  | 3 10 0            | 10 10 0            |
| 163                         | 71           | Cast-iron 9 in. diameter junction, with two faucets and one spigot end, as shown on Drawing, weighing 1 cwt. 3 qrs. 5 lb. ....   | „     | 3                  | 2 15 0            | 8 5 0              |
| 81                          | 72           | Cast-iron 9 in. diameter junction, with two faucets and one spigot end, as shown on Drawing, weighing 1 cwt. 3 qrs. 23 lb. ....  | „     | 1                  | 3 0 0             | 3 0 0              |
| 48                          | 73           | Cast-iron spigot and faucet 12 in. diameter pipe, 9 ft. long in the body, ⅝ in. thick in metal, weighing 6 cwt. 1 qr. 22 lb. ....                                      | „     | 9                  | 4 0 0             | 36 0 0             |
| 48                          | 74           | Cast-iron spigot and faucet 12 in. diameter pipe, 12 ft. long in the body, ⅝ in. thick in metal, weighing 8 cwt. 1 qr. 6 lb. ....                                      | „     | 30                 | 5 0 0             | 150 0 0            |
| 48                          | 75           | Cast-iron spigot and faucet 12 in. diameter pipe, ⅝ in. thick in metal, varying in length from 2 ft. to 11 ft. 6 in., as may be ordered, and as shown on Drawing ..... | cwt.  | 82                 | 0 15 0            | 61 10 0            |
| 149                         | 76           | Cast-iron straight 12 in. diameter spigot pipe, with 9 in. diameter faucet pipe junction, as shown on Drawing, weighing 5 cwt. 2 qrs. 4 lb. ....                       | each  | 40                 | 3 15 0            | 150 0 0            |
| 166                         | 77           | Cast-iron spigot and faucet 15 in. diameter bent pipe, as shown on Drawing, weighing 3 cwt. 0 qr. 13 lb. ....  | „     | 1                  | 4 5 0             | 4 5 0              |
| TOTAL .....                 |              |  |       |                    | £                 | 4,335 11 0         |
| Or deduct 30 per cent. .... |              |  |       |                    | £                 | 1,300 6 0          |
| Amount of Tender .....      |              |  |       |                    | £                 | 3,035 5 0          |

The quantities are not guaranteed as correct, and are merely for the guidance of Tenderers, being subject to omissions, deductions, alterations, and additions.

All work here enumerated shall be understood as being tested, painted, tarred, and delivered at the sites specified and ordered, in complete working condition, and in strict accordance with Specification.

### Appendix No. 65.

The Engineer-in-Chief for Sewerage to The Under Secretary for Public Works.

Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 14 December, 1893.

*Minute Paper.*

*Subject:* Eleven Tenders—Eastern Main Branch Sewer, Contract No. 69.

THE tenders for Contract No. 69 have now been checked, the lowest tender being that of Messrs. Carter, Gummow, & Co. at £45,207 8s. 11d.

The other tenders were:—

| Messrs.                        | £      | s. | d. |
|--------------------------------|--------|----|----|
| Messrs. John Ahearn, at ... .. | 47,061 | 3  | 9  |
| Kerle and Kerle, at ... ..     | 52,735 | 10 | 9  |
| H. McKenzie & Sons, at ... ..  | 53,505 | 2  | 7  |
| Justin McSweeney, at... ..     | 54,623 | 18 | 2  |
| Holloway Bros., at ... ..      | 55,104 | 8  | 9  |
| J. F. Carson, at ... ..        | 57,239 | 0  | 9  |
| Alex. Dean & Sons, at ... ..   | 58,165 | 10 | 8  |
| Langtree & Owen, at ... ..     | 59,676 | 16 | 1  |
| Parry and Farley, at ... ..    | 63,095 | 11 | 11 |
| J. Stewart & Co. ... ..        | 68,171 | 6  | 9  |

Messrs. Carter, Gummow, & Co. being the lowest tenderers for the construction of the Western Suburbs Main Eastern Branch Sewer, Contract No. 69, I beg to recommend acceptance of their tender, amounting to £45,207 8s. 11d., at schedule rates, on condition that they fill in and initial in their tender the average price per ton for all irregular castings, weighing in all 33 tons 12 cwt. 3 qrs. 12 lb., and the average price per ton for all cast-iron pipes, weighing in all 788 tons 8 cwt. 2 qrs. 27 lb.

C. H. OHLFSEN-BAGGE.

Not necessary.—R.H., 16/12/93. The Engineer-in-Chief. I recommend Carter, Gummow, & Co.'s tender at schedule rates.—R.H., 16/12/93. Under Secretary. Passed.—J.B., 18/12/93. Submitted to the Board of Reference, 18th December, 1893. The Board recommend acceptance of the tender of Carter, Gummow, & Co. at schedule rates.—J. W. HOLLIMAN, Secretary. Submitted.—J.B., 18/12/93. Approved; Funded Stock.—W.J.L., 21/12/93. Ask Messrs. Carter & Co., to call at 2 p.m. to-morrow. Done, 21/12/93. Tender accepted, 27/12/93. Auditor-General informed, 27/12/93.

## Appendix No. 66.

The Under Secretary for Public Works to Messrs. Carter, Gummow, & Co.

Gentlemen,

Department of Public Works, Sydney, 27 December, 1893.

I have the honor, by the direction of the Secretary for Public Works, to inform you that your tender, dated the 13th day of December instant, is accepted for the construction, erection, and completion of Eastern Main Branch Sewer, Western Suburbs Sewerage, from Premier-street to Sebastopol-street and branches (Contract 69), at the rates set forth in your schedule of prices, on the conditions following, namely:—

In lieu of paying any sums that may become due to you under the contract in cash, the same shall be applied in the purchase, in your names, of Funded Stock, under the Funded Stock Act of 1892, and the issue to you of Funded Stock to an equal amount from time to time due to you under the contract shall be accepted by you in full satisfaction of the money due under the contract; and for the carrying out of such arrangement you undertake to sign any applications, vouchers, books, or other documents that may be necessary. As the Funded Stock is issued in amounts of £10, or of some multiple of £10, any odd sum remaining above the sum issued shall be carried to your credit and be included in the next payment.

If it shall be represented to the Minister for Public Works at any time during the progress of this contract that an undue number of men are being employed thereon who have not been domiciled in this Colony for six months previously to such employment, and such allegation be proved to his satisfaction, the Minister shall have the power to call upon you to discharge any or all such men; and on such direction being conveyed in writing to you under the hand of the Under Secretary for Public Works you shall discharge such men forthwith, and in the event of your non-compliance with any such direction the Minister shall have power to declare this contract to be cancelled, as if this stipulation had been expressly set out in the cancellation clause of the general conditions relating to this contract.

The work is to be carried out in strict accordance with the plans, specification, schedule to specification, and general conditions, and to be started immediately, and completed within eighteen months from this date.

The Secretary for Public Works is willing, in response to your verbal request, to accept two approved bondsmen in the sum of £4,520 as security for the due performance by you of the contract.

I have to refer you to the Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage for further information, and to request that you will call upon the officer-in-charge of bonds and contracts at this office, for the purpose of executing the necessary agreement, &c., for the due observance of your contract.

I must also request you to be good enough to acknowledge the receipt of this letter of acceptance, and to intimate to me your assent to the terms hereof.

I am, &c.,

J. BURLING,

Under Secretary.

## Appendix No. 67.

CONTRACT 69 "A."

MEMORANDUM.

IN consideration of the Minister for Public Works, in and for the Colony of New South Wales, advancing to us the sum of £1000, and of any future advances to be made to us, we hereby agree to repay to the said Minister for Public Works the said sum of £1,000, and future advances, together with interest at the rate of £6 per centum per annum on such sums respectively from the date of advance on demand; and we hereby charge all moneys due or payable, or becoming due or payable to us under a certain contract for the construction of the Eastern Main Branch Sewer, Western Suburbs Drainage, Contract No. 69, Sydney Sewerage Works, in the said Colony, entered into by us with the Government of the said Colony; also all cement, building materials, and every other thing already used, or to be used in connection with our said contract, with the repayment of the said sum of £1,000, and any future advances and interest at the rate aforesaid; and we hereby undertake to give, whenever called upon to do so, a valid bill of sale to the said Minister for Public Works over the said cement, building materials, and every other thing used in connection with our said contract now stored in our premises at Illawarra Road, Marrickville, in the said Colony, or elsewhere, such bill of sale to contain a power of sale, and such other powers, provisos, and agreements as the said Minister for Public Works may be advised. Also, further undertake to give immediate possession of same to the said Minister, or any person appointed by him for that purpose, whenever called upon to do so.

As witness our hands, at Sydney, this 27th day of March, A.D. 1894.

Witnesses to the signatures of John Carter, Frank Moor-  
house Gummow, and David Graham Snodgrass,—

HAROLD F. NORRIE, J.P.

JOSHUA J. FARR, J.P.

Witness to the signatures of Peter Ewing and George }  
Maddison,—

J. T. WARLOW DAVIES.

JOHN CARTER.

F. M. GUMMOW

(By his attorney, J. CARTER).

D. G. SNODGRASS.

GEORGE MADDISON.

PETER EWING.

This is memorandum marked "A," referred to in the annexed declaration of John Carter, made before me this 29th day of March, A.D. 1894.

HAROLD F. NORRIE, J.P.

## STATUTORY DECLARATION.

I, JOHN CARTER, of William-street, North Sydney, in the Colony of New South Wales, contractor, do hereby solemnly declare and affirm that—

1. I am the duly constituted attorney of Frank Moorhouse Gummow, at present residing in South Australia, under and by virtue of a deed-poll or power of attorney, under the hand and seal of the said Frank Moorhouse Gummow, dated the 2nd day of January, 1894.
2. At the time of the execution by me as such attorney as aforesaid of the annexed memorandum, marked "A," I had not, nor have I since received notice of the revocation, by death or otherwise, of the abovementioned deed-poll or power of attorney.

And I make this solemn declaration as to the matters aforesaid, according to the law in this behalf made, and subject to the punishment by law provided for any wilfully false statement in any such declaration.

Taken and declared at Sydney, this 29th day }  
of March, 1894, before me,—

HAROLD F. NORRIE, J.P.

JOHN CARTER.

## Appendix No. 68.

CONTRACT 72.

AGREEMENT made this 16th day of March, in the year of our Lord 1891, between John Carter, David Graham Snodgrass, and George Forest, all of Sydney, in the Colony of New South Wales, contractors, carrying on business together under the name, style, or firm of "Carter & Co.," hereinafter styled or referred to as "The Contractors" of the one part, and Her Most Gracious Majesty Queen Victoria of the other part.

Whereas the Minister for Public Works of the said Colony recently called for tenders for the providing of all materials, labour, and every other thing requisite and necessary for, and the performance of all the works required in and about the construction, erection, completion, and maintenance of a storm-water sewer from Munni-street, Macdonald-street, Mitchell Road

Road to Shea's Creek, in the said Colony, as shown in the drawings relating thereto, and according to the specification, and under and subject to the general conditions and special conditions which are hereunto annexed. And whereas the contractors made the tender hereunto annexed, marked "C," for the providing of all plant and materials, labour, tools, and every other thing requisite and necessary for, and the performance of all the works required in and about the full and proper construction, erection, and completion and maintenance of the said works in accordance in all things with the specification, and under and subject to the general conditions and special conditions relating to the said works, and in accordance with the several plans or drawings relating thereto in the office of the Engineer-in-Chief for Sewerage, and marked No. "1" to No. "5" inclusive, and at or for the rates or prices mentioned and set out in the schedule of quantities and prices to the said tender, and to complete the said works within eight months from the date of acceptance of the said tender; that is to say, on or before the 28th day of October, 1891, as mentioned in the first clause of the said special conditions. And whereas the Minister for Public Works of the said Colony, acting on behalf of the Government of the said Colony, hath accepted the said tender of the contractors, and the contractors have, in compliance with the requirement in clause 6 of the said special conditions, deposited the sum of £900 in the Bank of New Zealand, at Sydney aforesaid, in the name of the Minister for Public Works aforesaid, at interest, upon fixed deposit, number 236,855, dated the 10th day March, 1891, for twelve months, and have handed the receipt for same to the Minister for Public Works, to be held by him as such Minister, or the Minister for Public Works for the time being of the said Colony, on behalf of Her Majesty, as security for the due performance of this contract, and all other matters and things herein contained, and which on the part of the contractors are to be done and performed. Now this agreement witnesseth that in consideration of the premises the contractors do hereby for themselves, their heirs, executors and administrators, covenant with and to Her said Majesty the Queen, Her heirs and successors.

That they, the contractors, shall and will find and provide all the materials, labour, plant, tackle, tools, implements, carriage, machinery, scaffolding, and every other thing requisite and necessary for, and shall and will perform the various works required in and about the full and proper construction, erection, completion and maintenance of a storm-water channel commencing at the junction of Union and Munni Streets, Macdonaldtown, in the said Colony, and extending more or less along the line of creek to Macdonald-street, and along that street; thence south along the course of the creek to its intersection with Mitchell Road; thence again in a southerly direction along the course of the creek to the northern angle of a Chinese garden; and thence in an easterly direction across a slight ridge to Shea's Creek, being a total distance of 77 chains and  $\frac{1}{100}$  of a chain, together with all manholes, junctions, &c., connected therewith, with such extensions or omissions as may be ordered in writing, being a portion of the works for Sydney Sewerage; this present contract being called or referred to as Contract No. 72, in accordance in all things with the specification hereunto annexed marked A, and the general conditions and special conditions hereunto annexed marked B and D, and with the several plans or drawings relating thereto in the office of the Engineer-in-Chief for Sewerage, and numbered "1" to "5" inclusive, and which are signed by the contractors, and at or for the rates or prices set out in the said schedule of quantities and prices to the said tender; it being also hereby declared that any additions to or deductions from the said works, mentioned or set out in the said specification, or shown in the said plans, are to be paid or allowed for as the case may be, at and according to the rates or prices in the said schedule of quantities and prices. And shall and will complete the whole of the said works within eight months from the date of acceptance of the said tender: that is to say, on or before the 28th day of October, 1891, as mentioned and provided in clause 1 of the said special conditions in accordance in all things with the said specification, general conditions, special conditions, and plans. And it is hereby agreed and declared between and by the said parties hereto that the said specification; general conditions, and special conditions marked respectfully as aforesaid, and the said tender marked as aforesaid, all being hereunto annexed as aforesaid, shall be read as incorporated in and forming part and parcel of these presents in like manner as if the same had been herein written and set forth at length, and that the said specification, general conditions, and special conditions, and tender, and these presents, shall together be taken to be the contract between the said parties in respect of the said works, and that all and whatsoever by the said specification, general conditions, and special conditions, or any or either of them, is to be done by the contractors, or shown on the said plans, shall be done in accordance therewith in all things by the contractors, their executors or administrators; and that all and whatsoever materials, goods, matters, and things which by the said specification, general conditions, and special conditions are to be supplied by the contractors in and about the construction and completion of the said works, shall be found, provided, and supplied by the contractors, their executors or administrators, in accordance in all things with the said specification, general conditions, special conditions, and plans. And it is hereby agreed that if the contractors, their executors or administrators, shall make default in proceeding with the said works or supplying the materials which, under the said specification, general conditions and special conditions, are to be supplied by the contractors, or in completing and finishing the said works in accordance in all things with the said specification, general conditions, and special conditions, and all things therein contained, and within the time for the completion of the said works as mentioned or provided in the said first clause of the said special conditions, the said sum of £900, so deposited as security for the due performance of this contract, shall be and become forfeited to Her Majesty the Queen, and may be used, paid, and applied so far as the same may be required in and about carrying out and completing the works in the said specification mentioned; and if any balance shall remain after the said works are completed the same shall remain to the credit of the Consolidated Revenue of the said Colony; and that the right of Her Majesty to deal with the said sum of £900 in manner aforesaid shall be in addition to all, any, or other rights or remedies which Her Majesty the Queen, or the Government of New South Wales, shall or may have or be entitled to against the contractors under these presents, or under the said specification, general conditions, and special conditions, or any or either of them, or otherwise for any breach or breaches of this contract.

In witness whereof the said parties to these presents have hereunto set their hands and seals, the day and year first before written.

Signed, sealed, and delivered by the said John }  
Carter, in the presence of,—  
HAROLD F. NORRIE, J.P.

JOHN CARTER.

Signed, sealed, and delivered by the said }  
David Graham Snodgrass, in the pre- }  
sence of,—  
HAROLD F. NORRIE.

D. G. SNODGRASS.

Signed, sealed, and delivered by the said }  
George Forrest, in the presence of,—  
HAROLD F. NORRIE.

GEO. FORREST.

#### CONTRACT 72—MEMORANDUM OF AGREEMENT.

MADE this 19th day of April, in the year of our Lord 1892, between the Honorable William John Lyne, the Minister for Public Works, in and for the Colony of New South Wales (hereinafter referred to as "the said Minister"), of the one part, and John Carter, David Graham Snodgrass, and George Forrest, of North Sydney, in the said Colony, contractors, carrying on business together under the name, style, or firm of "Carter & Co.," and hereinafter referred to as "the said contractors." Whereas by a certain agreement in writing, bearing date the 16th day of March, 1891, the said contractors covenanted with Her Majesty the Queen, her heirs or successors, to find and provide all the materials, tools, plant, labour, and every other thing requisite and necessary for and the performance of the various works required in and about the full and proper construction, erection, and completion of Munni-street, Macdonald-street, Mitchell Road to Shea's Creek storm-water channel, known as Contract No. 72, Sydney and Suburbs Storm-water Drainage, in accordance in all things with the printed notice tender specification, general conditions, and special conditions, thereunto annexed, and the plans or drawings relating thereto, and therein referred to, and to complete and finish the whole of the said works on or before the 28th day of October, 1891. And whereas the said works are still unfinished and not completed, and the said contractors have applied to and requested the said Minister to extend the time for the completion of the said works until the 18th day of August, 1892, which the said Minister hath consented to do. Now these presents witnesseth, that in consideration of the premises the said Minister, acting on behalf of the Government of the said Colony, doth hereby extend the time for completion of the works in the said agreement, tender, specification, general conditions, and special conditions, mentioned or referred to, until the 18th day of August, 1892, and that the said contractors do hereby jointly and severally covenant, promise, and agree with the said Minister, that they, the said contractors, shall, and will, well and truly complete the whole of the works mentioned in the specification, general conditions, and special conditions, and

the

the plans or drawings therein referred to, mentioned or shown, in accordance in all things with the said tender, specification, general conditions, special conditions, and plans and drawings, on or before the 18th day of August, 1892; and further, that at all times hereafter the said agreement shall be read and considered, as if the said 18th day of August, 1892, had been named in and by the said agreement, tender, specification, general conditions, and special conditions, as the day on or before which the said works were to be completed and finished by the said contractors; and that the said agreement shall not be considered as altered, or the stipulations, provisoes, and agreements therein or in the said specification, general conditions, and special conditions, in any way barred, waived, or departed from in any respect, other than as to the time within which the said works are to be completed, but that Her Majesty the Queen, her heirs and successors, the said Minister and his successors in office, and the Government of the said Colony, shall have all and every the rights, powers, and authorities, cause and causes of action, and suits, claims, and demands, given to or vested in her, or them, in and by the said agreement, tender, specification, general conditions, and special conditions in all respects against the said contractors, and each and every of them, as if the said 18th day of August, 1892, had been the day or time originally named in and appointed for the completion of the said works; and that all, and singular, the penalties, forfeitures, sum or sums of money, rights and privileges which would accrue to, or vest in Her said Majesty the Queen, her heirs or successors, the said Minister and his successors in office, or the Government of the said Colony, for or by reason, or on account of the said works not being completed and finished within the time named, and according to the said tender, specification, general conditions, special conditions, and the said agreement shall accrue to, or vest in Her said Majesty, her heirs or successors, the said Minister and his successors in office, or the Government of the said Colony, if the said works shall not be completed and finished in all things on or before the 18th day of August, 1892; and that the said agreement shall at all times be read and considered as if the said 18th day of August, 1892, was, and is the time therein named for the completion of the said works, instead of the said 28th day of October, 1891; and, lastly, that in consideration of such extension of time, as aforesaid, the said contractors shall not have any claim or demand against the Crown, or the Colonial Government, or the said Minister, for any alleged failure or delay on the part of the said Government in not setting out the said works, or furnishing plans or detailed drawings, or in not supplying machinery or materials, or otherwise arising out of any supposed failure, neglect, or default on the part of the said Government; and all such claims and demands are hereby expressly waived and surrendered. In witness whereof the said parties to these presents have herunto set their hands and seals the day and year first before written.

|  |                    |
|--|--------------------|
| Signed, sealed, and delivered by the said William John Lyne, the Minister }<br>for Public Works in and for the Colony of New South Wales, but not so }<br>as to incur or come under any personal liability in respect of the pre- }<br>mises, in the presence of,— J. BARLING. | WILLIAM JOHN LYNE. |
| Signed, sealed, and delivered by the said John Carter, in the presence of,—<br>HAROLD F. NORRIE, J.P.  | J. L. CARTER.      |
| Signed, sealed, and delivered by the said David Graham Snodgrass, in the }<br>presence of,— V. C. LUMSDAINE.   | D. G. SNODGRASS.   |
| Signed, sealed, and delivered by the said George Forrest, in the presence of,—<br>HAROLD F. NORRIE, J.P.   | GEO. FORREST.      |

#### CONTRACT 79.

AGREEMENT made this 10th day of March, in the year of our Lord 1892, between John Carter and David Graham Snodgrass, of Glebe and North Shore respectively, in the Colony of New South Wales, contractors, carrying on business together at the Glebe aforesaid, as contractors, under the name, style, or firm, of "Carter & Co.," and hereinafter styled or referred to as "the Contractors," of the first part, George Forrest, of Glebe aforesaid, contractor, of the second part, and Her Most Gracious Majesty Queen Victoria of the third part.

Whereas the Minister for Public Works, of the said Colony, recently called for tenders by notice published in the *Government Gazette* (of which notice a copy is hereunto annexed), for the providing of all materials, labour, and every other thing requisite and necessary for, and the performance of all the works required in and about the construction, erection, and completion of the North Shore Main Outfall Sewer from near Long Bay to Mount-street, in the said Colony, as shown in the drawings relating thereto, and according to the specification, and under and subject to the general conditions and special conditions which are hereunto annexed, and marked respectively "A," "B," and "C." And whereas the contractors made the tender hereunto annexed, marked "D," for the providing of all plant and materials (except such materials as in and by the said specification are mentioned as to be supplied by the Government of the said Colony), labour, tools, and every other thing requisite and necessary for, and the performance of, all the works required in and about the full and proper construction, erection, and completion, and maintenance, of the said works in accordance, in all things, with the said specification, and under, and subject to, the said general conditions and special conditions, and in accordance with the several plans or drawings, relating thereto, in the office of the Engineer-in-Chief for Sewerage, and marked "No. 1," "No. 2," "No. 3," "No. 3a," and "No. 4" to "No. 8," inclusive, and at or for the rates or prices mentioned and set out in the schedule of quantities and prices to the said tender, and to complete the said works within twenty-four months from the date of the acceptance of the said tender, that is to say, on or before the 10th day of March, 1894, as mentioned in the first clause of the said special conditions. And whereas the said contractors and the said George Forrest, carrying on business under the name, style, or firm, of "Carter & Co.," sometime since entered into a contract with Her said Majesty for the construction and maintenance of a storm-water sewer from Munni-street, Macdonald-street, Mitchell Road, to Shea's Creek storm-water channel, in the said Colony—the said contract being called or known as Contract No. 72, Sydney and Suburbs Storm-water Drainage. And whereas the said contractors and the said George Forrest, in carrying out the said contract, made a claim for certain extra works in connection therewith, amounting in all to the sum of £4,050 9s. 6d., which said claim they have agreed, by letter annexed hereto, marked "E," to waive in consideration of the said Minister accepting the present tender of the contractors for the said main outfall sewer, North Shore. And whereas the Minister for Public Works of the said Colony, acting on behalf of the Government of the said Colony, hath accepted the said tender of the contractors on condition that the said contractors and the said George Forrest execute the release hereinafter contained, waiving their said claims on Contract No. 72 hereinbefore referred to. And whereas the contractors have, in compliance with the requirement in clause six of the said special conditions, deposited the sum of £2,000 in the Bank of New Zealand, at Sydney aforesaid, in the name of the Under Secretary for Public Works, aforesaid, at interest, upon fixed deposit Number A7667, dated the 10th day of March, 1892, for twelve months, and have handed the receipt for same to the said Minister for Public Works, to be held by him as such Minister, or the Minister for Public Works for the time being of the said Colony, on behalf of Her Majesty, as security for the due performance of this contract, and all other matters and things herein contained, and which, on the part of the contractors, are to be done and performed. Now this agreement witnesseth that, in pursuance of the said agreement to waive the said claims on said Contract No. 72, and for the consideration aforesaid, and of the sum of 10s. on the execution hereof to the said George Forrest, paid by Her said Majesty (the receipt, whereof the said George Forrest doth hereby admit and acknowledge). They, the said contractors and the said George Forrest do respectfully hereby release Her said Majesty, her heirs and successors, the said Minister, and his successors in office, the constructing authority, and his successors, and the Government of the said Colony from all and singular the said claim or claims, and all actions, claims, costs, damages, expenses, and demands which they, the said several parties, hereto of the first and second parts, respectively, now have, or shall, or may, or otherwise could, or might, hereafter have, claim, or demand of, from, or against Her said Majesty, her heirs or successors, or the said Minister, or his successors in office, or the constructing authority, or his successors, or the Government of the said Colony or any of them, respectively, on account of the said claim for extra work, or otherwise on said Contract No. 72, and all interest for or in respect of the same, or for or on account of any other thing relating thereto. And this agreement also witnesseth that in consideration of the premises the contractors do hereby for themselves, their heirs, executors, and administrators, covenant with and to Her said Majesty the Queen her heirs and successors: That they, the contractors, shall and will find and provide all the materials (except such materials as in the said specification are mentioned as to be supplied

supplied by the said Government), labour, plant, tackle, tools, implements, carriage, machinery, scaffolding, and every other thing requisite and necessary for, and shall and will perform the various works required in and about the full and proper construction, erection, completion, and maintenance of the main outfall sewer, North Shore, commencing at nought chains, near Long Bay, and extending under private land to Grassmere-street near the eastern boundary of Cammeray Park; under Cammeray Park to corner of Alfred and Ernest Streets; and along Alfred-street to Mount-street, where it terminates, being a total length of about 1 mile 25·3 chains, together with shafts, branches, &c., connected therewith, being a portion of the work for Sydney sewerage—this present contract being called or referred to as “Contract No. 79”—in accordance in all things with the said specification, general conditions, and special conditions, and with the said several plans or drawings, and which are signed by the contractors, and at or for the rates or prices set out in the said schedule of quantities and prices to the said tender. It being also hereby declared that any additions to or deductions from the said works mentioned, or set out in the said specification, or shown in the said plans, are to be paid or allowed for, as the case may be, and according to the rates or prices in the said schedule of quantities and prices. And shall and will complete the whole of the said works within twenty-four months from the date of acceptance of the said tender, that is to say, on or before the 10th day of March, 1894, in accordance in all things with the said specification, general conditions, special conditions, and plans. And it is hereby agreed and declared between and by the said parties hereto that the said specification, general conditions, special conditions, and tender, all being marked as aforesaid, and the said schedule of quantities and prices, all being hereunto annexed, as aforesaid, shall be read as incorporated in and forming part and parcel of these presents in like manner as if the same had been herein written and set forth at length, and that the said specification, general conditions, special conditions, tender, and schedule of quantities and prices, and these presents shall together be taken to be the contract between the said parties in respect of the said works, and that all and whatsoever by the said specification, general conditions, and special conditions, or any, or either, of them is to be done by the contractors or shown on the said plans shall be done in accordance therewith in all things by the contractors, their executors, or administrators, and that all and whatsoever materials, goods, matters, and things, which by the said specification, general conditions, and special conditions, are to be supplied by the contractors in and about the construction and completion of the said works shall be found, provided, and supplied by the contractors, their executors or administrators, in accordance in all things with the said specification, general conditions, special conditions, and plans. And it is hereby agreed that if the contractors, their executors, or administrators, shall make default in proceeding with the said works, or supplying the materials which, under the said specification, general conditions, and special conditions, are to be supplied by the contractors, or in completing and finishing the said works in accordance in all things with the said specification, general conditions, and special conditions, and all things therein contained, and within the time for the completion of the said works as mentioned or provided in the said first clause of the said special conditions, the said sum of £2,000 so deposited as security for the due performance of this contract shall be and become forfeited to Her Majesty the Queen, and may be used, paid, and applied so far as the same may be required in and about carrying out and completing the works in the said specification mentioned, and if any balance shall remain, after the said works are completed, the same shall remain to the credit of the Consolidated Revenue of the said Colony, and that the right of Her Majesty to deal with the said sum of £2,000 in manner aforesaid shall be in addition to all, any, or other rights or remedies which Her Majesty the Queen or the Government of New South Wales shall or may have or be entitled to against the contractors under these presents, or under the said specification, general conditions, and special conditions, or any or either of them or otherwise for any breach or breaches of this contract.

In witness whereof the said parties to these presents have hereunto set their hands and seals the day and year first before written.

Signed, sealed, and delivered by the said John }  
Carter, in the presence of,— }  
V. C. LUMSDAINE. } JOHN CARTER.

Signed, sealed, and delivered by the said David }  
Graham Snodgrass, in the presence of,— }  
V. C. LUMSDAINE. } D. G. SNODGRASS.

Signed, sealed, and delivered by the said }  
George Forrest, in the presence of,— }  
V. C. LUMSDAINE. } GEO. FORREST.

## MEMORANDUM.

THE return of the security lodged for the due performance of the above contract is and will be accepted by us without prejudice to any of the rights of the constructing authority to enforce the penalties prescribed by the contract by reason of the non-completion within the time specified, and to all other rights of the constructing authority.

As witness our hands, at Sydney, this twentieth day of June, A.D. 1894.

Witness,—HAROLD F. NORRIE, J.P.

JOHN CARTER.  
D. G. SNODGRASS.

## Appendix No. 69.

## CONTRACT 77.

The Under Secretary for Public Works to Messrs. Carter, Gummow, & Co.

Gentlemen,

Department of Public Works, Sydney, 11 April, 1895.

I have the honor, by direction of the Secretary for Public Works, to inform you that your tender, dated the 13th March last, is accepted for the construction of the northern main sewer, Leichhardt and Annandale sections, No. 77, at the sum of £15,500, in the terms set out in the supplementary specification, a copy of which is sent herewith, and subject to the following special conditions, viz. :—

That if it shall be represented to the Secretary for Public Works at any time during the progress of this contract that an undue number of men are being employed thereon who have not been domiciled in this Colony for six months previously to such employment, and such allegations be proved to his satisfaction, the Minister shall have the power to call upon you to discharge any or all such men, and on such direction being conveyed to you, under the hand of the Under Secretary for Public Works, you shall discharge such men forthwith; and in the event of your non-compliance with any such direction, the Minister shall have the power to declare this contract to be cancelled as if this stipulation had been expressly set out in the cancellation clause of the general conditions relating to this contract.

The work is to be carried out in strict accordance with the several contract exhibits relating to this contract, modified by the supplementary specification above referred to, and the plan submitted with your tender, and to be completed within seventy-eight weeks from this date.

A fixed deposit receipt, in favour of the Secretary for Public Works, for the sum of £775, will be required as security for the due performance of contract within the stipulated time, and a personal bond in the sum of £12,000, and two bondsmen in the sum of £6,000 each, in connection with the maintenance as set out in the supplementary specification. Will you be good enough to notify to me your assent to these terms, and at the same time submit the names of two responsible persons who are willing to act as your sureties.

I have to refer you to the Engineer-in-Chief for Metropolitan Sewerage Construction for further information, and to request that you will, when required to do so, call upon the officer in charge of bonds and contracts at this office with your sureties for the purpose of executing the necessary documents for the due observance of your contract.

I have, &c.,  
J. BARLING,  
Under Secretary.

Estimate



## Estimate of the value of work to be performed.

CONTRACT No. 77.—Johnstone's Creek and White's Creek Aqueduct, above Footings.

| Description of Work.                | Unit.       | Probable Quantity. | Rate.  | £ s. d.       |
|-------------------------------------|-------------|--------------------|--------|---------------|
| Brickwork .....                     | cubic yard  | 1,935              | 2/10/- | 4,837 10 0    |
| Tarred metal decking .....          | "           | 95                 | 2/8/-  | 228 0 0       |
| Special blucstone concrete .....    | "           | 1,000              | 3/-    | 3,000 0 0     |
| Sandstone concrete .....            | "           | 1,260              | 1/8/-  | 1,764 0 0     |
| Sand filling between parapets ..... | "           | 130                | 1/-    | 6 10 0        |
| Pymont ashlar .....                 | cubic foot  | 13,250             | 3/6    | 2,318 15 0    |
| Cement facing .....                 | square yard | 2,750              | 2/6    | 342 15 0      |
| Slate covers .....                  | each        | 40                 | 2/-    | 4 0 0         |
|                                     |             |                    |        | £ 12,501 10 0 |

Agreement made this 16th day of May, in the year of our Lord 1895, between John Carter, Frank Moorhouse Gummow, and David Graham Snodgrass, of North Sydney, in the Colony of New South Wales, contractors, carrying on business together under the name, style, or firm of "Carter, Gummow, & Co." (and hereinafter styled or referred to as "the contractors"), of the one part, and Her Most Gracious Majesty Queen Victoria, of the other part.

WHEREAS the Minister for Public Works of the said Colony (hereinafter called the said Minister) recently called for tenders by notice published in the *Government Gazette* (of which notice a copy is hereunto annexed and marked "A"), for construction of the northern main sewer, Leichhardt and Annandale sections, Contract No. 77, Sydney Sewerage, as shown in the drawings relating thereto in the office of the Engineer-in-Chief for Metropolitan Sewerage Construction, and marked "No. 1" to "No. 10," both inclusive, and according to the specification, schedule to specification, general conditions, and special condition, which are hereunto annexed and marked respectively "B," "C," "D," and "E." And whereas the contractors made the tender hereunto annexed, marked "F," to provide the material and perform the various works required in and about the full and proper construction, erection, and completion of the said sewerage works agreeably to the said drawings, specification, schedule to specification, general conditions, and special condition, as modified by the supplementary specification, also hereunto annexed and marked "G," and the contractors' drawing, marked "No. 11," now in the office of the said Engineer-in-Chief for Metropolitan Sewerage Construction, and at or for the price or sum set out in the said tender. And whereas the said tender was accepted by the said Minister, and such acceptance (a copy of which is annexed hereto, and marked "H") was duly notified to the contractors on the 11th day of April now last past, and the contractors have assented thereto, as per their letter annexed hereto, marked "I." And whereas the contractors have deposited the sum of £775 in the Bank of New Zealand, at Sydney, in the said Colony, in the name of the Under Secretary for Public Works, at interest upon fixed deposit, No. 422,187, dated the 29th day of April now last past for twelve months, and have handed the receipt for the same to the said Minister to be held by him as such Minister or the Minister for Public Works for the time being of the said Colony, on behalf of Her Majesty, as security for the due performance of this contract, and all other matters and things herein contained, and which, on the part of the contractors, are to be done and performed. And whereas the said contractors have, with two approved sureties, entered into bonds to Her said Majesty conditioned to secure the due performance of the removal of so much of the said works at their own cost as shall have been constructed on the "Monier System" if the Engineer shall be dissatisfied with the same at any time during either of the periods of maintenance set out in the said general conditions and supplementary specification respectively, and for the re-erection and construction of the said works, and for the free and uninterrupted flow of sewage during the progress of such rebuilding at their own expense in accordance in all things with the said specification, schedule to specification, general conditions, special condition, and plans therein respectively referred to, and within thirty-nine weeks from the date of being called upon to do so. Now this agreement witnesseth that, in consideration of the premises, the contractors do hereby, for themselves, heirs, executors, and administrators, covenant with and to Her said Majesty the Queen, Her heirs, and successors: That they, the contractors, shall and will perform the various works required in and about the full and proper construction, erection, and completion of the said sewerage works in accordance in all things with the said specification, schedule to specification, general conditions, special condition, supplementary specification, and drawings, and at and after the price, and within the time in the said tender mentioned. And that they will well and truly remove so much of the said works at their own cost as shall have been constructed on the "Monier System" if the Engineer shall be dissatisfied with the same at any time during either of the respective periods of maintenance set out in the said general conditions and supplementary specification, and re-erection and construct the said works, and provide for the full and uninterrupted flow of sewage during progress of such rebuilding at their own expense, in accordance in all things with the said specification, schedule to specification, general conditions, and special condition, and the plans therein respectively referred to, within thirty-nine weeks from the date of being called upon to do so. And it is hereby agreed and declared between and by the said parties hereto that the said copy, notice, specification, schedule to specification, general conditions, special condition, supplementary specification, tender, copy, letter of acceptance of tender, and letter of assent thereto, marked as aforesaid, all being hereunto annexed as aforesaid, shall be read as incorporated in and forming part and parcel of these presents in like manner and if the same had been herein written and set forth at length, and that the said several annexures, the said drawings, and these presents shall together be taken to be the contract between the said parties in respect of the said sewerage works amplified in manner following: that is to say, that the said general conditions shall at all times be read and construed as if the stipulation contained in the said letter of acceptance of tender as to the discharge of men (not domiciled in this Colony for six months previously to their employment on the said works) employed on the said works when called upon to do so, and the penalty for non-compliance therewith had been expressly set out in the said general conditions.

In witness whereof the said parties to these presents have hereunto set their hands and seals the day and year first before written.

Signed, sealed, and delivered by the said John Carter, in the presence of,—  
HAROLD F. NORRIE.

JOHN CARTER.

Signed, sealed, and delivered by the said Frank Moorhouse Gummow, by his attorney, John Carter, acting under power of attorney, dated the 2nd day of January, 1894, in the presence of,—  
HAROLD F. NORRIE.

FRANK MOORHOUSE GUMMOW  
(By his Attorney, JOHN CARTER).

Signed, sealed, and delivered by the said David Graham Snodgrass, in the presence of,—  
HAROLD F. NORRIE.

D. G. SNODGRASS.

This is the agreement referred to in our respective bonds to Her Majesty the Queen, dated this 16th day of May, A.D. 1895.

GEORGE FORREST, } Sureties.  
JAMES GILLAN, }

Witness,—HAROLD F. NORRIE.

KNOW

Know all men by these presents,—That we, John Carter, Frank Moorhouse Gummow, and David Graham Snodgrass, of North Sydney, in the Colony of New South Wales, contractors, carrying on business together under the name, style, or firm of "Carter, Gummow, & Co." (and hereinafter referred to as the said contractors), are jointly and severally held, and firmly bound unto Her Most Gracious Majesty Queen Victoria, in the penal sum of £12,000 sterling, to be paid in Sydney, in the said Colony, to Her said Majesty, her heirs, or successors, for which payment, well and truly to be made, we bind ourselves, and each of us, our and each and every of our heirs, executors, and administrators jointly and severally firmly by these presents.

Sealed with our seals dated the 16th day of May, in the year of our Lord 1895.

WHEREAS, by agreement bearing even date herewith, and expressed to be made between the said contractors of the one part, and Her said Majesty of the other part, the said contractors covenanted to perform the various works required in and about the full and proper construction, erection, and completion of the northern main sewer, Leichhardt and Annandale sections, Contract No. 77, Sydney Sewerage, according to the copy notice, specification, schedule to specification, general conditions, special conditions, supplementary specification, tender, copy letter of acceptance of tender, and letter of assent thereto, thereunto annexed, and marked "A," "B," "C," "D," "E," "F," "G," "H," and "I" respectively, and certain drawings relating thereto, now in the office of the Engineer-in-Chief for Metropolitan Sewerage Construction, and marked No. 1 to No. 11, both inclusive.

And whereas the said contractors have severally offered to become and be bound to her said Majesty, her heirs, and successors, for the due removal of so much of the said works, at their own cost, as shall have been constructed on the "Monier System," if the Engineer shall be dissatisfied with the same, at any time during either of the periods of maintenance set out in the said general conditions and supplementary specification respectively, and for the re-erection and construction of the said works, and for the free and uninterrupted flow of sewage during the progress of such rebuilding, at their own expense, in accordance in all things with the said specification, schedule to specification, general conditions, special condition, and plans therein respectively referred to, and within thirty-nine weeks from the date of being called upon to do so. Now, the condition of the above-written bond and obligation is such that if the said contractors do, and shall well and truly remove so much of the said works at their own cost, as shall have been constructed on the "Monier System," if the Engineer shall be dissatisfied with the same at any time during the respective periods of maintenance set out in the said general conditions and supplementary specification, and re-erect and construct the said works, and provide for the free and uninterrupted flow of sewage during the progress of such rebuilding at their own expense, in accordance in all things with the said specification, schedule to specification, general conditions, and special condition, and the plans therein respectively referred to, within thirty-nine weeks from the date of being called upon to do so. Then this obligation will be void and of none effect, otherwise to remain in full force and virtue.

Signed, sealed, and delivered by the above-named }  
John Carter, in the presence of,— } JOHN CARTER.

HAROLD F. NORRIE.

Signed, sealed, and delivered by the above-named }  
Frank Moorhouse Gummow, by his duly consti- } FRANK MOORHOUSE GUMMOW.  
tuted attorney, John Carter, acting under power } (By his Attorney, JOHN CARTER.)  
of attorney, dated the 2nd January, 1894, in the }  
presence of,— }  
HAROLD F. NORRIE.

Signed, sealed, and delivered by the above-named }  
David Graham Snodgrass, in the presence of,— } D. G. SNODGRASS.  
HAROLD F. NORRIE.

#### STATUTORY DECLARATION.

I, JOHN CARTER, of Sydney, in the Colony of New South Wales, contractor, do hereby solemnly declare and affirm that—

1. I am the duly constituted attorney of Frank Moorhouse Gummow, at present residing at Adelaide, in the province of South Australia, under and by virtue of a Deed Poll or Power of Attorney, under the hand and seal of the said Frank Moorhouse Gummow, dated the 2nd day of January, 1894.
2. From letters and telegrams recently received from the said Frank Moorhouse Gummow, I have every reason to believe, and I verily do believe, that the said Frank Moorhouse Gummow is still alive.
3. At the time of the execution by me as such Attorney as aforesaid of a bond to and agreement with Her Most Gracious Majesty Queen Victoria, and bearing date the 16th day of May, 1895, in connection with Contract No. 77, Sydney Sewerage Works, I had not nor have I since received notice of the revocation by death or otherwise of the above-mentioned Deed Poll or Power of Attorney.

And I make this solemn declaration as to the matters aforesaid according to the law in this behalf, and subject to the punishment by law provided for any wilfully false statement in any such declaration.

Taken and declared at Sydney, this 16th day of }  
May, 1895, before,— } JOHN CARTER.

HAROLD F. NORRIE, J.P.

### Appendix 70.

Messrs. Carter & Co. and Messrs. Gummow and Gillan to The President of Tender Board.

Sir,

Sydney, 10 June, 1891.

We have the honor to enter our protests against the acceptance of the tender of Messrs. Bond and Hudson for Contract No. 79, North Shore Sewerage, on the following grounds:—

1. That the tender of Messrs. Bond and Hudson for Contract No. 56, Potts' Point sewerage, was accepted by your Board and not taken up by them.
2. Upon fresh tenders being called the tender of Mr. G. E. Hudson was the lowest, but was not accepted by the Board, in accordance with their rules and regulations.

Upon these grounds we, as tenderers for the North Shore sewerage, beg to protest against the tender of Messrs. Bond and Hudson being now accepted.

We have, &c.,  
GUMMOW AND GILLAN.  
CARTER & CO.

Let me have papers *re* Bond and Hudson's tender for Contract 56.—R.H., 10/6/91. Herewith.—J.C.P., 10/6/91.  
Mr. Hickson for report.—J.B., 10/6/91.

In January, 1890, C. S. Bond (afterwards Bond and Hudson) tendered for Sewerage Contract No. 56 at a ridiculously low figure, and, as anticipated, had to throw up the contract and forfeit deposit. They were the lowest again when fresh tenders were invited, but did not get the work, they being ineligible under the Tender Board Regulations, clause 14. The same firm now (some sixteen months later) are the lowest tenderers for Sewerage Contract 79, and it is contended by the writers of the within letter that their tender should not be accepted. I cannot recommend that this course be taken. It is true, under clause 14, they can be excluded from competing for other works at the pleasure of the President. But in all fairness there must be some limit (when no fraudulent action has taken place) to this prohibition; and it seems to me, after sixteen months, all bar to their tendering should be removed. In recommendation on face of tender.—R.H., 10/6/91.  
Under Sec.

Resubmit when we deal with the tenders.—J.B., 30/12/91.

Appendix No. 71.

CONTRACT No. 79.

No. 1.

NORTH SYDNEY SEWERAGE.—Cost of lining over sewers 4 ft. x 2 ft. 8 in., and 4 ft. x 3 ft. Taking ordinary thickness of sewer at 5 inches.

Lineal feet, 3,282·5—Length of sewer, 4 ft. x 2 ft. 8 in. :—

|                                  | lin. yd. | at      | £   | s. | d. |
|----------------------------------|----------|---------|-----|----|----|
| Sandstone concrete, 1-inch thick | 62       | at 37/6 | 116 | 5  | 0  |
| "    2                           | 121·12   | "       | 245 | 17 | 0  |
| "    2½                          | 162·73   | "       | 305 | 2  | 4  |
| "    3                           | 195·13   | "       | 365 | 17 | 4  |
| "    4                           | 261·75   | "       | 490 | 15 | 7  |
| Bluestone concrete, 1            | 79·76    | at 56/- | 223 | 6  | 7  |
| "    2                           | 162·17   | "       | 454 | 1  | 6  |
| "    2½                          | 204·38   | "       | 572 | 5  | 3  |
| "    3                           | 247·24   | "       | 692 | 5  | 5  |
| "    4                           | 334·97   | "       | 937 | 18 | 4  |

Length of sewer, 4 ft. x 3 ft. = 2,539 lineal feet :—

|                                  |        |         |     |    |    |
|----------------------------------|--------|---------|-----|----|----|
| Sandstone concrete, 1-inch thick | 49·56  | at 37/6 | 92  | 18 | 6  |
| "    2                           | 101·09 | "       | 189 | 10 | 10 |
| "    2½                          | 127·66 | "       | 239 | 7  | 3  |
| "    3                           | 155·05 | "       | 290 | 14 | 4  |
| "    4                           | 210·31 | "       | 394 | 6  | 7  |
| Bluestone concrete, 1            | 61·80  | at 56/- | 173 | 0  | 10 |
| "    2                           | 127·65 | "       | 351 | 16 | 5  |
| "    2½                          | 158·35 | "       | 443 | 7  | 7  |
| "    3                           | 191·56 | "       | 536 | 7  | 4  |
| "    4                           | 259·52 | "       | 726 | 13 | 1  |

NORTH SYDNEY SEWERAGE.—Comparative cost for varying thicknesses of two lengths of sewers, 4 ft. x 2 ft. 8 in. ; length, 3,282·5 lineal feet :—

|                                  | £   | s. | d. | £     | s. | d. |
|----------------------------------|-----|----|----|-------|----|----|
| Sandstone concrete, 1-inch thick | 116 | 5  | 0  |       |    |    |
| Bluestone " 1 "                  | 223 | 6  | 7  |       |    |    |
|                                  |     |    |    | 339   | 11 | 7  |
| Sandstone " 2 "                  | 245 | 17 | 0  |       |    |    |
| Bluestone " 2 "                  | 454 | 1  | 6  |       |    |    |
|                                  |     |    |    | 699   | 18 | 6  |
| Sandstone " 2½ "                 | 305 | 2  | 4  |       |    |    |
| Bluestone " 2½ "                 | 572 | 5  | 3  |       |    |    |
|                                  |     |    |    | 877   | 7  | 7  |
| Sandstone " 3 "                  | 365 | 17 | 4  |       |    |    |
| Bluestone " 3 "                  | 692 | 5  | 5  |       |    |    |
|                                  |     |    |    | 1,058 | 2  | 9  |
| Sandstone " 4 "                  | 490 | 15 | 7  |       |    |    |
| Bluestone " 4 "                  | 937 | 18 | 4  |       |    |    |
|                                  |     |    |    | 1,428 | 13 | 11 |

Four feet x 3 feet lengths ; 2,539 lineal feet :—

|                                  |     |    |    |       |    |    |
|----------------------------------|-----|----|----|-------|----|----|
| Sandstone concrete, 1-inch thick | 92  | 18 | 6  |       |    |    |
| Bluestone " 1 "                  | 173 | 0  | 10 |       |    |    |
|                                  |     |    |    | 265   | 19 | 4  |
| Sandstone " 2 "                  | 189 | 10 | 10 |       |    |    |
| Bluestone " 2 "                  | 351 | 16 | 5  |       |    |    |
|                                  |     |    |    | 541   | 7  | 3  |
| Sandstone " 2½ "                 | 239 | 7  | 3  |       |    |    |
| Bluestone " 2½ "                 | 443 | 7  | 7  |       |    |    |
|                                  |     |    |    | 682   | 14 | 10 |
| Sandstone " 3 "                  | 290 | 14 | 4  |       |    |    |
| Bluestone " 3 "                  | 536 | 7  | 4  |       |    |    |
|                                  |     |    |    | 827   | 1  | 8  |
| Sandstone " 4 "                  | 394 | 6  | 7  |       |    |    |
| Bluestone " 4 "                  | 726 | 13 | 1  |       |    |    |
|                                  |     |    |    | 1,120 | 19 | 8  |

NORTH SYDNEY SEWERAGE.—Comparative cost of packing for varying thicknesses over whole length of sewer. Total length, 6,821·5 lineal feet.

|  | £     | s. | d. | £     | s. | d. |
|--|-------|----|----|-------|----|----|
| Sandstone and bluestone in 4 ft. x 2 ft. 8 in. = 1 in. thick | 339   | 11 | 7  |       |    |    |
| "    "    4 ft. x 3 ft. = 1 in. " "                          | 265   | 19 | 4  |       |    |    |
|  |       |    |    | 605   | 10 | 11 |
| "    "    4 ft. x 2 ft. 8 in. = 2 in. " "                    | 699   | 18 | 6  |       |    |    |
| "    "    4 ft. x 3 ft. = 2 in. " "                          | 541   | 7  | 3  |       |    |    |
|  |       |    |    | 1,241 | 5  | 9  |
| "    "    4 ft. x 2 ft. 8 in. = 2½ in. " "                   | 877   | 7  | 7  |       |    |    |
| "    "    4 ft. x 3 ft. = 2½ in. " "                         | 682   | 14 | 10 |       |    |    |
|  |       |    |    | 1,560 | 2  | 5  |
| "    "    4 ft. x 2 ft. 8 in. = 3 in. " "                    | 1,058 | 2  | 9  |       |    |    |
| "    "    4 ft. x 3 ft. = 3 in. " "                          | 827   | 1  | 8  |       |    |    |
|  |       |    |    | 1,885 | 4  | 5  |
| "    "    4 ft. x 2 ft. 8 in. = 4 in. " "                    | 1,428 | 13 | 11 |       |    |    |
| "    "    4 ft. x 3 ft. = 4 in. " "                          | 1,120 | 19 | 8  |       |    |    |
|  |       |    |    | 2,549 | 13 | 7  |

The proportion of cost stands as follows :—

|   |       |
|---|-------|
| Taking the packing at 1-inch thickness as | 1·    |
| "    "    2                               | 2·049 |
| "    "    2½                              | 2·576 |
| "    "    3                               | 3·113 |
| "    "    4                               | 4·21  |

J. W. T. BOYS, 25/5/92.

## No. 2.

## Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.

*Minute Paper.**Subject:—Contract No. 79—North Sydney Outfall Sewer.—Driving of Tunnels.*Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 19 May, 1892.

THE tunnels from some of the shafts on this contract will be commenced in a few days, and it is, therefore, necessary that it should be settled how they are to be driven, whether with 4-inch charges of compressed powder, 2-inch charges or without blasting.

With a view of arriving at the method which would give the least annoyance to the residents in the vicinity of the sewer, consistent with economy, I have made comparative estimates.

The excavation by "guttering and gadding" will cost 3s. per cubic yard more than with 4-inch charges of compressed powder, but as it is impossible to drive the tunnel by blasting to the exact size desired, considerably more concrete has to be used in lining when the driving is done by blasting than when done by "guttering and gadding," and taking this into consideration, I estimate it will cost about £1,250 less to do the tunnels without blasting compared with doing it with 4 inches of powder.

The 2-inch charges, with the extra supervision that would be required, would be the most costly of any.

I wish, however, to point out that while it would save annoyance and money to drive the tunnels without explosives, it would take longer to do the work.

J. DAVIS.

Messrs. Carter & Co. have undoubtedly fixed their schedule prices speculatively to increase their profits on the contracts as much as possible, and, if so, to the loss of the Department. Mr. Davis seems, therefore justified in the suggestions made, as they would likely cause a saving of £1,000, and clause 55 of the specification is no doubt a saving clause against speculative prices.—C. H. OHLFSEN BAGGE, 19/5/92. The Engineer-in-Chief.

Ask contractors to see me on Thursday morning.—R.H., 23/5/92. Messrs. Carter & Co., 23/5/92.

While I think the Department would hardly be justified in adopting this unusual method of carrying out the work, it is very clear we should aim at getting our work done as economically as possible. Blasting may, therefore, be allowed on the understanding that the average allowance of 4 inches for concrete packing over and above specified size of tunnels be reduced to 2 inches.—R.H., 26/5/92. Mr. Davis.

Contractors informed. Copy of letter attached.—J.D., 27/5/92.

## No. 3.

## Supervising-Engineer Davis to Messrs. Carter &amp; Co.

Gentlemen,

42, Elizabeth-street, 27 May, 1893.

Referring to the conversation which your Messrs. Carter and Snodgrass had with the Engineer-in-Chief respecting the mode of driving the tunnels in your sewerage contract No. 79, and to your verbal agreement that on condition you were allowed to do the tunnel excavation under item No. 3 of the schedule of prices, by blasting with 4-inch charges of compressed powder, you would not ask to be paid for more than 7 inches of lining, such 7 inches to include the 3-inch thickness of cement rendering, I am directed to inform you that the Engineer-in-Chief has approved of the above agreement without prejudice to his right, under clause 55 of the specification, to order the excavation to be taken out otherwise should he deem it necessary to do so.

The cross-sections will be taken in the usual manner, and you will be paid for the excavation ordered, and for a maximum of 2 inches of concrete lining in excess of the excavation ordered.

Would you kindly write, intimating your acceptance of this arrangement.

Yours, &amp;c.,

J. DAVIS.

## No. 4.

## Messrs. Carter &amp; Co. to Supervising-Engineer Davis.

Contract No. 79, North Sydney Outfall Sewer:

Sir,

Box No. 10, North Sydney Post Office, 2 June, 1892.

In reply to your letter of the 27th May, we hereby agree to accept the terms of the same, viz. :—That the excavation (tunnel) on the above contract shall be carried out under item No. 3 in the schedule of prices, and that the lining shall be paid for to a maximum thickness of 2 inches over plan dimension, making a total thickness of 7½ inches instead of 7 inches as set down in your letter.

We are, &amp;c.,

CARTER &amp; CO.

This is according to contract drawings.—J.D., 6/6/92.

## No. 5.

## Messrs. Carter &amp; Co. to Supervising-Engineer Davis.

Sir,

Box No. 10, North Sydney, 10 August, 1893.

Referring to our letter of 2nd June, 1893, in which we accept a maximum thickness of 2 inches over plan dimension as to quantity to be paid for lining tunnel on contract No. 79, North Sydney sewerage; we beg to state that this was agreed to on the supposition that the ground would admit of such dimension being practicable.

In this contract, as in some others of a similar character, notably Contract No. 53, Waverley sewerage, the ground met with is of such a nature as to render it impossible to keep within the usual limits.

The 2 inches referred to was fixed as being 2 inches less than usually works out as an average cross-section, but owing to the foregoing reason, and to unavoidable errors in the alignment, we ask to be allowed cross-sections equal to those of Contract No. 53, less the 2 inches which was intended to be deducted.

We are, &amp;c.,

CARTER &amp; CO.

Register and connect papers.—J.D., 9/8/93.

Previous papers 92/1,216 herewith.—F.C.P., 10/8/93.

## No. 6.

## Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.

*Minute Paper.*

*Subject:—North Sydney Outfall Sewer, Contract No. 79—Contractors write, asking that the question of thickness of lining in tunnel should be reconsidered.*

Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 14 August, 1893.

IN June of last year, at the time the tunnelling was commenced on this contract, the contractors undertook, if they were allowed to do the excavation under item No. 3 of the schedule of prices, they would not require payment for more than 7½ inches lining or a margin of 2 inches over the cross-sections of the tunnel excavation ordered.

The tunnel excavation is nearly finished and the first length of about 18 chains of lining is in progress.

The contractors now write asking that the question of the thickness of the lining to be paid for should be reconsidered.

They allege that the ground met with in the tunnels was of an exceptional nature, and similar to that on the Waverley and Woollahra branch sewer (contract No. 53), and they, therefore, desire that they be allowed cross-sections equal to those paid for on that contract, less 2 inches.

The rock in the tunnels at Waverley and North Shore is certainly alike, and a number of "floors" and "faces" were met with at both places which materially increase the area of the tunnels. The cross-sections as a consequence were unusually large at Waverley, the average margin of the lining over the excavation ordered being about 5½ inches. Difficulties of the same nature have been experienced at North Shore, and the cross-sections are likely to work out equally as large as the Waverley ones.

The

The papers show that when the agreement was made it was thought that there would be no exceptional difficulties to be encountered in the driving, and that the lining would not exceed the cross-section of excavation by more than 4 inches. On this understanding, Messrs. Carter & Co. offered to forego 2 inches of the lining if they were allowed to do the excavation as they desired. The question now arises whether (seeing that the rock has proved to be similar to Waverley), they should have the agreement modified so as to be paid on the basis of that contract.

It was evidently the intention of the Engineer-in-Chief for the contractor to bear the expense of 2 inches of lining, and the contractors ask that by regarding Waverley and North Shore as parallel cases this should be done.

I, therefore, beg to recommend that the 2 inches to margin of tunnel-lining be increased to 3½ inches in thickness.  
J. DAVIS.

The 2 inches was decided upon on the assumption that the average allowance for concrete-packing was 4 inches. As it is now stated, this really works out at 5¼ inches. Mr. Davis' suggestion is only fair and equitable, and may therefore be adopted.—R.H., 15/8/93.

For the consideration of the Engineer-in-Chief.—C. H. OHLFSEN BAGGE, 15/8/93. Messrs. Carter & Co. informed.—J.D., 21/8/93.

No. 7.

Supervising-Engineer Davis to Messrs. Carter & Co.

Gentlemen,

Department of Public Works, Sydney, 21 August, 1893.

I have to acknowledge the receipt of yours of the 10th instant, stating the nature of the ground through which the tunnels have passed is not what was anticipated, and that therefore the maximum thickness of 2 inches over the cross-section ordered for the excavation (see my letter, 27th May, 1892), is not sufficient, and asking that as the nature of the rock is similar to that passed through in the tunnels of the Waverley and Woollahra Branch Sewer, the cases be regarded as parallel, and that you be allowed the cross-sections equal to those on that contract less 2 inches.

In reply I have to inform you that the Engineer-in-Chief has decided, on account of the nature of the rock, to modify the agreement, contained in my letter of 27th May, 1892, to the extent of increasing the margin of 2 inches thickness of lining, over the cross-section of excavation ordered, to a maximum of 3½ inches. Otherwise the terms of the letter to remain unaltered.

It is also to be understood that this additional allowance in the lining is to cover the cost of any extra concrete, which will be required through unavoidable errors in the levels and alignments of the tunnels, including those between shafts Nos. 3 and 4.

Will you please accept this modification of the agreement previously made respecting the lining of the tunnels in writing.

I have, &c.,

J. DAVIS,

Supervising Engineer.

No. 8.

Messrs. Carter & Co. to Supervising-Engineer Davis.

Ssr,

Alfred-street, North Sydney, 28 August, 1893.

We have the honor to acknowledge your letter of 21st August *re* maximum of lining to be allowed in tunnels on Contract No. 79, North Sydney Sewerage, and to inform you that we agree to accept the same according to the terms of your letter.

We have, &c.,

CARTER & CO.

Please put with other papers.—J.D., 30/8/93.

Appendix No. 72.

No. 1.

Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.

*Minute Paper.*

*Subject* :—Contract No. 79, North Shore Outfall—Recommending that Excavation be extended 85 links near Long Bay.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 26 May, 1892.

THE contractors ask that the excavation in their contract be extended 85 links nearer to Long Bay to give an outlet to the tunnel west of shaft at 0 chains. This length of excavation would have been included in Contract No. 79 to enable the surplus material to be conveniently taken to Long Bay where it has to be deposited, but at the time that contract was let the exact line of sewer east of shaft at 0 chains had not been finally settled.

I recommend that the contractors be given this short length of work, which will cost—tunnel excavation, 40 cubic yards at 60s., £120.

J. DAVIS.

Mr. Davis' statement is quite correct, and since the outlet end of this tunnel has now been decided upon, it will undoubtedly be of great convenience to the contractor to excavate the outlet end of 85 links at a cost of £120.—C. H. OHLFSEN BAGGE, 26/5/92.

The Engineer-in-Chief. Approved.—R.H., 26/5/92. Contractors informed.—J.D., 27/5/92.

No. 2.

Supervising-Engineer Davis to Messrs. Carter & Co.

Gentlemen,

42, Elizabeth-street, 27 May, 1892.

I have to acknowledge the receipt of your letter of the 21st instant, asking to be allowed to extend your tunnel excavation for 85 links east of shaft at 0 chains, and in reply I have the honor to inform you that the Engineer-in-Chief has approved of you doing as you wish, the excavation to be paid for under schedule item No. 3, and the tunnel to be taken out to admit of 4 feet by 3 feet sewer with one ring (5 inches) of mining being inserted.

You may also make a cutting from the point where the 85 links terminate, as shown on accompanying tracing, but this work must be done at your own cost.

Yours, &c.,

J. DAVIS.

Tracing showing line of sewer for the 85 links extension enclosed.—J.D.

No. 3.

Supervising-Engineer Davis to The Engineer-in-Chief for Sewerage.

*Minute Paper.*

*Subject* :—Contract No. 79, North Sydney Outfall, Ernest-street Branch Sewer.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 19 October, 1893.

A LENGTH of 33 feet of the Ernest-street branch sewer was included in the above contract. The levels of the remaining 568 feet could not be fixed at the time the contract was let, as the details of the reticulation draining to Ernest-street had not been worked out. The reticulation carried out is shown on attached plan in thick blue line, and that for which plans are ready in thin blue lines. At present the sewage from the pipes, and from the houses in the district, is draining into a creek, which crosses Walker-street near Ernest-street, and as there are great complaints from the residents of the serious nuisance

nuisance caused thereby, it is most desirable that the sewage should be diverted into the outfall sewer as soon as possible. If the balance of the Ernest-street branch is constructed simultaneously with the outfall sewer, then, on the completion of that sewer (which will be in about six months) and the outfall works (designs for which are ready), the whole of the sewerage of the district referred to and shown on plan attached will be provided for.

By carrying out this branch in conjunction with Contract No. 79 a shaft, which is estimated to cost £160, which otherwise would have to be sunk and built, can be saved.

I recommend that Messrs. Carter & Co. be asked to do the work in question at their schedule rates for Contract No. 79, amounting to £1,220.

J. DAVIS.

As Mr. Davis has explained, it will be a saving of £160 if this Ernest-street branch sewer is constructed now, while the work for the main sewer is in progress, and by the time the main sewer is completed the drainage of the Holterman and Berry Estate (which is ready for tendering) can be at once discharged into the main sewer through this branch. I beg, therefore, to submit Mr. Davis' recommendation for favourable consideration.—C. H. OHLFSEN-BAGGE, 19/10/93. Engineer-in-Chief.

Recommended. It would be a most desirable thing, from a sanitary point of view, to let this work be done now as an extension of the existing contract. Funds are available.—R.H., 20/10/93. Under Secretary. List for approval.—J.B., 21/10/93. Approved by Minister. W.J.L. Order No. 3,737.—D.C.M'L., 28/10/93. J.B. Roads.—B.C., 30/10/93. Seen. Mr. Davis to note.—R.H., 31/10/93. Contractors informed.—J.D., 27/11/93.

No. 4.

Supervising-Engineer Davis to Messrs. Carter & Co.

Gentlemen,

Department of Public Works, Sydney, 27 November, 1893.

I have the honor to inform you that the Minister has approved of your executing the Ernest-street branch sewer, as shown on the accompanying plan, in connection with your sewerage contract, No. 79, at your schedule rates for that contract.

I enclose a schedule in which is given the probable quantities of the different kinds of work in this branch sewer.

Will you please sign this schedule, undertaking to do the work at the rates referred to above, and given in the schedule.

Yours, &c.,

J. DAVIS,  
Supervising Engineer for Sewerage.  
(Through Mr. Boys.)

Appendix 73.

No. 1.

The Principal Assistant Engineer for Sewerage to The Engineer-in-Chief for Sewerage.

NECESSITY for doing that portion of the North Shore Sewerage Works which connects Milson's Point at Jeffrey-street.

THE present contract, No. 79, comprising a length of 1 mile 25·3 chains, of the main North Shore outfall sewer from Wiloughby Bay to junction of Alfred and Mount Streets, is the first section of the North Shore sewerage works.

The second section should be "the outlet works," and the third section, which might be proceeded with simultaneously with the outlet works, would be the extension of the main outfall sewer now asked for, from junction of Alfred and Mount Streets southward to the junction of Campbell and Jeffrey Streets, being (including some minor branches) a total length of about 76·90 chains.

By way of comparison, I have prepared an office estimate of the cost of this extension, according to present prices, amounting, as per detail statement attached, approximately, to £12,831 19s. 6d., and an estimate of the same work in accordance with contract prices of Contract No. 79 of the main outfall sewer in progress, which, as per detail statement attached, amounts, approximately, to £16,307 17s. 8d.

The detail plans of the outlet works are unavoidably very intricate, and it will take at least another month (if no other works come between) to complete the quantities.

The designs of the main outfall sewer extension, between Mount and Jeffrey Streets, excepting general plan and section, have not yet been commenced.

C. H. OHLFSEN-BAGGE, 15/3/94.

There is no reason why this extension should not be gone on with at once. I cannot, however, see my way to recommend that it be carried out as an extension of the existing contract, which, at schedule rates, would amount to £16,307 17s. 8d., whereas the office estimate is £12,831 19s. 6d. The greater part of this difference lies in one item, "Excavation in shafts," which, in present contract, owing to their great depth, carries a very high price, viz., 78s. per cubic yard. This Messrs. Carter & Co. are prepared to reduce to 40s. per cubic yard, which would reduce the total cost to £13,700, or about £1,000 above the office estimate. I believe, however, if tenders were invited we could get the work done under the office estimate.—R.H., 22/3/94. Under Secretary. Submitted.—J.B., 28/3/94.

Referring to the Minister's intimation this morning, that he was prepared to let Messrs. Carter & Co. carry out this work as an extension of their present contract, provided they agreed to do so for the departmental estimate of £12,831 19s. 6d., no claims whatsoever to be made for extras, and all payments to be made at the allowed schedule rates, I have had an interview with Mr. Carter, who is prepared, on the part of his firm, to comply with the Minister's decision. Submitted for formal approval.—R.H., 29/3/94.

For approval.—J.B., 30/3/94. Approved.—W.J.L., 30/3/94. Accept.—J.B., 30/3/94.

No. 2.

The Under Secretary for Public Works to Messrs. Carter & Co.

Sirs,

Department of Public Works, Sydney, 16 June, 1894.

I have the honor, by direction of the Secretary for Public Works, to inform you that your tender, dated this day, is accepted for Contract No. 79A, Sydney Sewerage Works, at the sum of twelve thousand eight hundred and thirty-one pounds nineteen shillings and sixpence (£12,831 19s. 6d.), subject to the following special condition, viz.:—If it shall be represented to the Secretary for Public Works at any time during the progress of this contract that an undue number of men are being employed thereon who have not been domiciled in this Colony for six months previously to such employment, and such allegation be proved to his satisfaction, the Minister shall have the power to call upon you to discharge any or all such men, and on such direction being conveyed to you under the hand of the Under Secretary for Public Works, you shall discharge such men forthwith; and in the event of your non-compliance with any such direction, the Minister shall have the power to declare this contract to be cancelled as if this stipulation had been expressly set out in the cancellation clause of the general conditions relating to this contract.

The work is to be carried out in strict accordance with the several contract exhibits relating to this contract, and to be completed within sixteen months from this date.

The security required on this contract will be a fixed deposit receipt, in favour of the Secretary for Public Works, for the sum of £650.

I have to refer you to the Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage for further information, and to request that you will call upon the officer-in-charge of bonds and contracts at this office, for the purpose of executing the necessary documents for the due observance of your contract.

I am, &c.,  
J. BARLING,  
Under Secretary.

"E."

" E. "

## TENDER FOR CONTRACT No. 79A, SYDNEY SEWERAGE WORKS.

To the Honorable the Minister for Public Works, Bridge-street, Sydney, N.S.W.,—

We, the undersigned, do hereby offer to construct, completely finish, and maintain the various works for Contract No. 79A, Sydney Sewerage Works, in accordance with the supplementary specification, specification, special conditions, general conditions, and drawings, prepared for that purpose in your department, for the sum of £12,831 19s. 6d. sterling, within sixteen months from the date hereof.

Should this offer be accepted, we undertake to lodge with the Under Secretary for Public Works, within seven days from the date of notification of acceptance of this tender, a bank deposit receipt, in the name of the Secretary for Public Works, for the sum of £650 sterling, as security for the due performance of the contract.

We hereby undertake to execute the required contract when called upon to do so.

JOHN CARTER.  
DAVID GRAHAM SNODGRASS.

16 June, 1894.

This is the tender marked " E.," referred to in our annexed agreement with Her Majesty the Queen, dated the 20th day of June, A.D. 1894.

Witness,—HAROLD F. NORRIE.

JOHN CARTER.  
D. G. SNODGRASS.

" F. "

## LETTER OF ACCEPTANCE.

Sirs,

Department of Public Works, Sydney, 16 June, 1894.

I have the honor, by direction of the Secretary for Public Works, to inform you that your tender, dated this day, is accepted for Contract No. 79A, Sydney Sewerage Works, at the sum of twelve thousand eight hundred and thirty-one pounds nineteen shillings and sixpence (£12,831 19s. 6d.), subject to the following special condition, viz. :—

If it shall be represented to the Secretary for Public Works at any time during the progress of this contract that an undue number of men are being employed thereon who have not been domiciled in this Colony for six months previously to such employment, and such allegation be proved to his satisfaction, the Minister shall have the power to call upon you to discharge any or all such men, and on such direction being conveyed to you under the hand of the Under Secretary for Public Works, you shall discharge such men forthwith, and in the event of your non-compliance with any such direction the Minister shall have the power to declare this contract to be cancelled as if this stipulation had been expressly set out in the cancellation clause of the general conditions relating to this contract.

The work is to be carried out in strict accordance with the several contract exhibits relating to this contract, and to be completed within sixteen months from this date.

The security required on this contract will be a fixed deposit receipt, in favour of the Secretary for Public Works, for the sum of £650.

I have to refer you to the Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage for further information, and to request that you will call upon the officer-in-charge of bonds and contracts at this office, for the purpose of executing the necessary documents for the due observance of your contract.

I am, &c.,  
J. BARLING,  
Under Secretary.

Messrs. Carter &amp; Co., Contractors, North Sydney.

This is the copy acceptance marked " F.," referred to in our annexed agreement with Her Majesty the Queen, dated the 20th day of June, A.D. 1894.

JOHN CARTER.  
D. G. SNODGRASS.

Witness,—HAROLD F. NORRIE.

## Appendix No. 74.

## PUBLIC WORKS.

(Report from the Engineer-in-Chief for Public Works, together with Minutes, respecting the Contracts let to Messrs. Carter, Gummow, & Co.)

Ordered by the Legislative Assembly to be printed, 19 December, 1895

## The Engineer-in-Chief for Public Works to The Under Secretary for Public Works.

Department of Public Works, Engineer-in-Chief's Office, Sydney, 21 November, 1895.

As there appears a likelihood of the Session closing without an opportunity being given me of denying the statements made by Mr. Varney Parkes, as regards the connection of Messrs. Carter, Gummow, & Co. with the Public Works Department, and the charges made against myself personally, I am reluctantly compelled to bring the matter again before the Minister.

Although it may be thought, as, indeed, it has been said, that I am making too much of this matter, and that no one really takes any serious notice of these statements, I need hardly point out what a serious matter it would be if they were believed, and either the Minister, my officers, contractors, or the general public lost confidence in me; and there is always a fear of this taking place when charges such as Mr. Parkes has made are not contradicted.

I would, therefore, ask the Minister to consider the advisability of having these charges and statements thoroughly investigated by some independent authority, having full powers to call witnesses and examine them on oath.

ROBT. HICKSON,  
Engineer-in-Chief for Public Works.

Submitted.—J.B., 21/11/95.

Mr. Hickson may be informed that the statements to which he refers herein have never had the effect of diminishing the complete confidence I, as Minister, have always had in him in the important office he holds. That I cannot believe they will, in the slightest degree, affect his position with reference to his officers, contractors, or the general public, and that having consulted the Cabinet as to his request for a commission of inquiry, I am able to state that my colleagues agree with what I have above written. If Mr. Hickson desires to place any rebutting statement before the public I shall have much pleasure in laying it on the Table of the Assembly.—J.H.Y., 10/12/95.

Mr. Hickson.—J.B., 11/12/95.

## The Engineer-in-Chief for Public Works to The Under Secretary for Public Works.

Department of Public Works, Engineer-in-Chief's Office, Sydney, 17 December, 1895.

WHILE I cannot disguise the fact that I feel disappointed that the Minister could not see his way to have the charges made against me in connection with the contracting firm of Messrs. Carter, Gummow, & Co. investigated by a Royal Commission, I quite understand the difficulties surrounding such a course, and very gratefully acknowledge the handsome way in which that decision is conveyed to me.

As a written reply to the charges is the only course now open to me, and as the Minister has kindly extended to me the privilege of such reply, I gladly avail myself of his permission, and ask that he will give the following statement such publicity as in his discretion he may deem desirable.

It is difficult in a report of this character to traverse all the charges in anything like an exhaustive manner, but I will endeavour to do so as clearly as possible, and in the order in which they appear in *Hansard*, avoiding all personalities and confining myself to the simple facts of the case.

With



With the first portion of Mr. Parkes' statement, that "contracting in vast sums of public money must be conducted with the greatest purity possible," I entirely concur. I contend, and I speak with a fairly large experience of tendering, not only in Australia, but in England and Ireland, that the system adopted in the Public Works Department in this Colony compares favourably with any other with which I am acquainted, in fact the department is so safeguarded with checks in its dealing with tenders that it would be practically impossible, without almost inconceivable collusion, to find a loophole for corrupt practices to creep in. The tenders are opened in public, and not only are the results published to the world in the daily press, but complete lists of the tenders received, and their amounts, are at once exhibited in the most conspicuous parts of the public offices, and before being dealt with by the responsible officers. Every subsequent action is capable of being fully criticised by an observant public; in fact, a greater publicity is given to all our transactions with tenders, so far as my experience goes, than is granted in any other country in the world.

To come now to the more specific charges, I have, for the sake of convenience, made extracts from Mr. Parkes' speech, giving my replies thereto in consecutive order.

During the week, or the week before, I asked the Secretary for Public Works whether Messrs. Gillan and Forrest were not sureties for the proper fulfilment of the contracts of this firm of Carter, Gummow, & Co. The reply I got was that Messrs. Gillan and Forrest were the sureties for those contractors. I wish honorable members to closely follow this matter. What I am about to read is a notice which appeared in the *Sydney Morning Herald* on the 13th of this month—that is, last Friday week—not very long ago. The notice shows that a dissolution of partnership took place, and that the very sureties for Carter, Gummow, & Co.—Messrs. Gillan and Forrest—are members of this business. The following is the notice:—

"Notice is hereby given that the partnership lately subsisting between us, the undersigned, John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, James Gillan, George Maddison, and Peter Ewing, as contractors, carrying on business in Adelaide (South Australia) and Sydney (New South Wales) under the name, style, or firm of Carter, Gummow, & Co., was on the 1st day of April, 1895, dissolved by mutual consent in so far as regards the said George Maddison and Peter Ewing, who retired as from that date from the said firm. All debts due or owing by the said firm will be received and paid by the said John Carter, David Graham Snodgrass, George Forrest, Frank Moorhouse Gummow, and James Gillan, who continue the business under the same style of Carter, Gummow, & Co.

"As witness our hands this 1st day of April, A.D. 1895.

|          |                  |                  |
|----------|------------------|------------------|
| (Signed) | F. M. GUMMOW.    | GEORGE FORREST.  |
|          | JOHN CARTER.     | GEORGE MADDISON. |
|          | D. G. SNODGRASS. | PETER EWING.     |
|          | JAMES GILLAN.    |                  |

This is a nice state of affairs! I wish to point it out to honorable members, if they do not quite realise it. If the Government accept sureties consisting of persons who are members of the firm of contractors, supposing the contractors go insolvent, or cheat the Government by defective work, suppose they enter into fraud to defeat the Government in large contracts of £30,000 or £50,000, what check is there upon them? The very specification which the Government issue makes it imperative that these sureties shall be disinterested persons altogether. The object of having sureties is to have men of means at the back of the contractors, so that if anything goes wrong—if the contractors go insolvent, or defraud the Government, if they carry out bad work—the Government can come down upon the sureties. But here is a case where these contracts total nearly £100,000, with sureties of their own partnership. This is a nice state of affairs.

I wish to go further, and to show that there has seldom been a case, taking it in this way, in which any private business would offer to give away contracts to the extent of £20,000 without offering them to competition and to tender. No private individual would ever dream of going into such a business transaction such as that. Yet this firm of contractors, Messrs. Carter, Gummow, & Co., have received between £45,000 and £50,000 of Government contracts without any tender. Not that there were no contractors to tender, because we know that at the present time of dearth of employment there were any number of contractors to tender, in order to keep their plant from being idle. They were willing to tender for the smallest work possible; yet this work is given out without tender to this special firm of contractors.

I asked the Secretary for Public Works last week what connection Mr. Hickson had with the firm and with this work. I was told that Mr. Hickson was the engineer to these contractors; but I am informed, upon the most reliable authority, that of a Mr. Maddison, the contractor, who has left this firm, that Mr. Hickson took the position as a partner in the firm, he being a son of the Engineer-in-Chief. Now, it is an unfortunate position that this firm should have been allowed contracts under such circumstances as these; their engineer having to communicate with his father, who is in a position in the Public Works Department, in which he could grant all sorts of concessions. This firm are the only contractors who during the last twelve months have received these numerous concessions. I have it upon the authority of Mr. Maddison, who has undertaken to produce a copy of the telegram, that a wire was sent in March, 1894, by one of this firm of contractors, Mr. Carter, to another member of the firm, Mr. Gummow, who was then in South Australia, to this effect: "Mr. Hickson must be taken into the firm at any cost." It was about this time that Mr. Hickson left the department, as his father said, on the score of retrenchment, and took up his position as an alleged partner in this firm, or, as I have been informed by the Minister, their chief engineer.

With reference to Carter & Co.'s contracts with the Public Works Department, a cash deposit has in every case been taken, and in the case of Contract No. 77, at Balmain, an additional personal security has been given for the stability of that portion of the work constructed on the Monier system, valued by the department at £12,000. The sureties in this case are Messrs. Forrest and Gillan, who are bound in the amount of £6,000 each, whilst the contractors, Messrs. Carter, Gummow, and Snodgrass, are bound in the sum of £12,000 (£24,000 in all). This special precaution, which is unique in its way, was taken as the Monier system, though successful elsewhere, had not been previously tested in the colonies, and is far beyond the requirements of the specification, these being already covered by a cash fixed deposit of £775, which is held by the department.

In this particular contract the department recognises only Messrs. Carter, Gummow, and Snodgrass as contractors, and so long as the sureties have separate estates to the value of the security required, and on this point every care has been taken [see the printed papers laid on the Table of the House], I contend the department has been properly safeguarded, especially when, as in this case, the personal security is over and above that usually demanded.

The firm has received one contract only without public tender, viz., Contract 79A, at North Sydney, amounting to £12,832; and even this was an extension of work already in hand.

This contract was given them by the late Minister for Public Works, on the representation of Mr. E. M. Clark, M.P., who pointed out the urgent necessity for pushing on that portion of the work, not only from a sanitary point of view, but so as to prevent some 120 men then employed by Messrs. Carter and Co. on the first section of the North Shore Sewerage Works from being thrown on the already congested labour market. Even so, the extension was granted only on the contractors agreeing to a reduction of £3,476 from schedule rates.

My son is not now, nor never was, a partner in the firm, and as he happened to be in Adelaide, and, as far as I know, knew nothing about the firm's transactions in Sydney, he did not communicate with me, either directly or indirectly, in connection with the firm's business.

I know nothing about the telegram alleged to have been sent in connection with the appointment of my son, having heard of it for the first time in Mr. Parkes' statement, and cannot understand how it could have been sent, seeing that my son left the department in April, 1893, and that the telegram of March, 1894, is said to have been sent when he had already been in the employ of the firm for nearly twelve months.

Having established this connection between the Engineer-in-Chief's son and the firm, I intend presently to show what concessions were given to these contractors. In the first place, they competed for some sewerage works which were going on at Balmain. Honorable members are well aware that these contracts are tendered for nowadays at schedule prices, that is to say, quantities are taken out and the Government officers place schedule prices upon each of the items. Fifteen firms of contractors tendered for the works at Balmain at schedule prices, and the lowest tenderer was the firm of Messrs. Carter, Gummow, & Co. These contractors sent in a price ridiculously low as compared with the fourteen other firms tendering. Their tender was 28½ per cent. under the schedule prices. The next was 18½ per cent.

After their tender was accepted, and after they were notified of the acceptance, they were enabled to place plans in the department for the carrying out of the work upon an entirely new plan, called the Monier system. The other contractors had no opportunity of competing with the firm for the carrying out of the work upon this system. I am assured by other contractors that whereas Messrs. Carter, Gummow, & Co. obtained a contract at £15,500, they would have been willing to carry out the job at £12,500 to £13,200.

Under the schedule prices of which I have spoken there is one item put down for brickwork and cement arches, 2,020 yards, at £2 10s. a yard. That was substituted under the Monier system by sandstone and concrete, put down at £1 8s. per cubic yard. There was that difference in the prices for the 2,020 yards. On that item alone a concession of £1,650 was made to these contractors. Honorable members will see that when such concessions are allowed, other contractors must be quite within the mark in saying that if they had had the opportunity they could have carried out the job at a figure from £2,300 to £3,000 below that paid to this particular firm.

The same firm within the last eighteen months received a contract for sewerage works at North Shore. They received their contract under a schedule tender, and their sureties as usual were those of their own firm. No query is made as to whether they are in a good financial state or as to whether they can provide good disinterested sureties.

After they had received the first contract the member for the district, no doubt with the best intentions and with the object of finding work for the unemployed, recommended that a certain extension should be carried out. The Engineer-in-Chief reported that as a matter of urgency certain extensions to the contract should be carried out along various streets. How is it possible that the work could have been urgent seeing that the outlet into the ocean for the whole of the sewerage scheme has not even been taken in hand? Until the outlet has been completed, how could the urgency of constructing branch lines of sewerage arise? Without any contract tendering, without any preparation of plans, without an effort to save the country unnecessary expenditure, a contract of £35,000 was given to this firm without competition for this extension work. It is no wonder that the contractors of this city complain of this contract being given.

In connection with this contract, I wish to point out that the Engineer-in-Chief, upon the 22nd March, 1894, wrote this minute:

"There is no reason why this extension should not be gone on with at once. I cannot, however, see my way to recommend that it be carried out as an extension of the existing contract, which, at schedule rates, would amount to £16,307 17s. 8d., whereas the office estimate is £12,831 19s. 6d. The greater part of this difference lies in one item, "excavations in shafts," which in present contract, owing to their great depth, carries a very high price, namely 78s. per cubic yard. This Messrs. Carter & Co. are prepared to reduce to 40s. per cubic yard, which would reduce the total cost to £13,700, or about £1,000 above the office estimate. I believe, however, if tenders were invited we could get the work done under the office estimate.—R. R. P. H., 22/3/94."

It was about this time that Mr. Hickson, junior, became a member of the firm. I find this minute by the Engineer-in-Chief on the 29th of the same month:—

"Referring to the Minister's intimation this morning, that he was prepared to let Messrs. Carter & Co. carry out this work as an extension of their present contract, provided they agreed to do so for the departmental estimate of £12,831 19s. 6d., no claims whatsoever to be made for extras, and all payments to be made at the allowed schedule rates.—"

That means that they might be allowed as extras—

"I have had an interview with Mr. Carter, who is prepared, on the part of his firm, to comply with the Minister's decision. Submitted or formal approval.—R. R. P. H., 29/3/94."

This was on the 30th March, 1894. How sudden a change! It is not the Minister who has to do with this. The Minister is generally led by the head of the department, it does not matter whether it is the present or the last Minister. The heads of these departments ought to be above reproach. There ought to be the greatest possible check put upon them. When we see a rapid change like this in a minute in a few days, after a son of the gentlemen concerned has taken office under the contractors, then there is some suspicion. It is impossible to make definite charges, but the case looks so grave that it ought to be filtered out in this House.

Mr. YouNG: Does the honorable gentleman assert that the engagement of young Mr. Hickson took place in the meantime—during those two or three days?

With the exception of the arrangement made, as stated above, on Contract 79A, at North Sydney, no concessions have been made to Messrs. Carter, Gummow, & Co. Contract No. 77 (Balmain), which was let by public tender, and for which they were lowest tenderers, cannot be regarded as such, as they are allowed to construct the works in accordance with an alternative tender submitted with, and at the same time as, the others, at a slight gain in price to the department, and under conditions of the most stringent nature in case of failure.

The tenders were fairly close. [See papers laid on Table of the House.] Mr. Parkes is, therefore, mistaken in stating that the second tender was only 18½ per cent. below schedule; it was 25½ per cent., as against Carter & Co.'s 28½ per cent., besides which, 28½ per cent. is not ridiculously low; it is not an uncommon thing to have tenders 30 per cent. below schedule.

The tender, with plans for carrying out the work under the Monier system, was deposited with the Tender Board at the same time as all other tenders, and was simply an alternative one. After very careful examination by Mr. Darley and myself, the system was thought worthy of trial, under the severe conditions imposed, and the alternative proposal was recommended by the Board of Reference for acceptance.

The materials used in the Monier arches and sewer, substituted for brick and concrete, was not sandstone and concrete; it was 3 to 1 compo., and was estimated by the department at from 80s. to 90s. per cubic yard, not at 28s. as stated.

Cash security for £4,000 was taken in this case, as required by the specification. There were no sureties.

Contract 79A, an extension of the preceding work to Jeffrey's-street, was, as before stated, given to Messrs. Carter & Co. on the representations of the member for the district; but I strongly urged that tenders should be invited for the work, as I considered that it might be done more cheaply.

The cost of the extension which was taken at the departmental estimate was £12,832, not £35,000 as stated.

As already pointed out, my son was never a partner, nor did he take office under Messrs. Carter & Co. between the 22nd and 29th March, 1894, when the change of front is said to have taken place, but had already been in the employ of the firm in Adelaide since May, 1893.

In my second minute, quoted by Mr. Parkes, it will be seen that I distinctly stated that I forwarded the paper, on an intimation from the Minister that he (the Minister) was prepared to let the work to Messrs. Carter & Co., and I carefully abstained from making any recommendation, merely forwarding the paper for formal approval.

Mr. V. PARKES: I believe it was during that time.

Mr. YOUNG: Does the honorable member assert that?

Mr. V. PARKES: I believe it was.

These gentlemen have a contract at Johnstone's Bay for what they call stormwater channelling. This stormwater channelling is taken through a lot of mud flats. For four or five weeks the Government employed about forty or fifty of the unemployed to drain the water off this land for the contractors. The Government actually employed the unemployed for this purpose. I can bring plenty of evidence on oath that forty or fifty men were employed for four or five weeks draining the water off the land where these gentlemen had to carry out their contract. The effect of that was to put £250 or £300 into the pockets of the contractors.

I could cite other concessions given to these gentlemen, information as to which has been given to me not by one contractor, but by twelve or fourteen. Innumerable concessions have been given to them, and it would only be wearying the House to particularise them.

Mr. YOUNG: Let us have them all while the honorable member is about it!

Mr. V. PARKES: If an inquiry is made the House will find that there has been an undue amount of favouritism towards not only these contractors but many others.

To show the artifice with which questions are answered by the Engineer-in-Chief, on the 19th instant I asked these simple questions of the Minister:

"(7.) What connection has a Mr. Hickson with this firm or with the works? (8.) Is this Mr. Hickson a son of the present Engineer-in-Chief?"

This was the reply:

"(7.) He is engineer to the contractors. (8.) He is the son of the Engineer-in-Chief for Public Works; but the Balmain contract referred to is being carried out under the supervision of the President of the Water and Sewerage Board and Engineer-in-Chief for Sewerage Construction, Mr. Darley."

Now, Mr. Darley has only been appointed to his present position about two months, and during all the time that this contract was being carried out it was under the Engineer-in-Chief.

Mr. YOUNG: No.

Mr. V. PARKES: The Engineer-in-Chief was the chief designer of it, and the contract was not carried out under Mr. Darley. I made sure of that fact.

The Minister, in his reply, went on to say:

"In the case of the other contract referred to, namely, the sewerage works at North Sydney, which was carried out under the supervision of the Engineer-in-Chief for Public Works, I am informed that Mr. Hickson, junior, had no connection with that work, being at that time in South Australia."

But Mr. Hickson has been going backwards and forwards between here and South Australia. That makes no difference as to his connection with the firm. He is looking after their work in South Australia, and looking after their work here; and such an answer as that is, on the face of it, simply a blind, and it shows that there is some reason why there should be a full inquiry into the circumstances attending this contract.

Mr. LYNE: Before the honorable gentleman sits down perhaps I might be allowed to ask him a question. He said that the firm in question had contracts to the amount of £35,000, and he only referred to one of £13,000. What other contracts made up the total of £35,000?

Mr. V. PARKES: As far as I am informed, there was a contract of £13,000, another of £10,800, and another of £11,000, all let without tender.

The sand-pump dredging at Rozelle Bay, carried out by the department, flooded the land through which Messrs. Carter & Co. had to construct the Johnstone's Creek stormwater channel. As this would have given them a claim for compensation, a drain had to be cut to take the water off their works, and place the land in the same condition as when tenders were received, Messrs. Carter & Co. providing flood-gates at their own cost to keep the tidal waters out. The cost of the drain was about £70; it is, therefore, difficult to see how £250 to £300 can have been put into the contractors' pockets. I am quite satisfied that, by my prompt action in this case, I saved the department a large sum which the contractors could have claimed for the flooding of their works.

In any case this drain would have had to be made later on to form an outfall for Johnstone's Creek during the progress of the continuation of the present work.

It is difficult to say what is meant by "innumerable concessions" to these and other contractors, and the only cases I can think of are those of Messrs. Gilliver and Curtis, at Rookwood, and Messrs. Johnston, O'Rourke, and Gordon, at Rushcutter's Bay. The first of these had a contract for partly draining the Rookwood Necropolis, and this was extended so as to embrace the whole cemetery, at an additional cost of £5,747, at their schedule prices. The second case can scarcely be looked on as a concession, as the contract provided for the construction of a part of the whole sewer, at the discretion of the Minister. This contingency was provided for in the specification in case the adjacent landowners were unwilling to allow the sewer to be carried through their land without compensation. When the consent of all interested had been obtained, I directed the contractors—with the approval of the Minister—to carry out the whole work. The value of the extension was £2,071.

This contract was never under my supervision. It has, ever since the work commenced, been under Mr. Darley or Mr. J. M. Smail, who was acting Engineer-in-Chief for Metropolitan Sewerage Construction, during Mr. Darley's absence in New Zealand.

My son had no connection with any contract of Messrs. Carter & Co.'s in New South Wales until last August, when he returned from South Australia. He was in the latter colony from May, 1893, and did not go backwards and forwards between here and South Australia in the interest of the firm. During the whole of this time (two years and three months) he got one holiday to visit Sydney on purely private business.

He has never communicated—directly or indirectly—with me or the office in connection with Messrs. Carter, Gummow, & Co.'s works, the whole of the transactions with the office having been carried out either through Mr. Carter or Mr. Gummow.

The only contract let to Carter & Co. without tender is, as before stated, the extension of the North Shore Sewerage Works to Jeffrey's-street (Contract 79a) for £12,832.

I am quite satisfied to leave this matter now in the Minister's hands, and through him to accept the verdict of the public, knowing that I have never had, during the whole course of my professional life, any dealings with contractors which I would be afraid to expose to the most searching inquiry.

Any impartial person reading these replies, which I have made as brief as possible, can, I feel certain, only come to the conclusion that Mr. Parkes has been wilfully misled by some evil-minded person whose motives were as impure as their statements were false.

ROBT. HICKSON,  
Engineer-in-Chief for Public Works.

Minute

Minute by The Under Secretary for Public Works.

Department of Public Works, Sydney, 19 December, 1895.

Carter, Gummow, & Co.'s Contracts.

It is, I think, proper for me, in submitting this to the Minister, not only as Under Secretary but as Chairman of the Board of Reference, to express the entire confidence which the Board have in Mr. Hickson as one of its members. Every matter relating to the contracts which are referred to the Board is most critically examined, and I have great pleasure in saying that Mr. Hickson, as well as every other member of the Board, shows the utmost desire to have every phase of the various questions which arise in connection with tenders thoroughly enquired into, and to this end they willingly give all facilities to the Board.

I fully agree with Mr. Hickson in saying that it is difficult to conceive of any practical method of applying further checks in connection with our tender system. I do not think there is any country in the world where such publicity is given to proceedings in regard to this very important matter.

J. BURLING.

May be laid on Table of the Assembly.—J.H.Y., 19/12/95.

Appendix No. 75.

STATEMENT prepared by Mr. C. J. Henty, of Parbury, Henty, & Co's. Sales to Messrs. Carter & Co., and Carter, Gummow, & Co., 1st May, 1892, to 30th June, 1896.

| Item. | Casks. | Received. | North Shore. |           | Marrickville. |         | Annandale and Leichhardt. |                         | Waverley. |           | Sundries.  |          |             |
|-------|--------|-----------|--------------|-----------|---------------|---------|---------------------------|-------------------------|-----------|-----------|------------|----------|-------------|
|       |        |           | Def.         | Probable. | Def.          | Probab. | Annandale.                | Leichhardt and Rozelle. | Def.      | Probable. | Drummoyne. | Parsons. | Not traced. |
| 1     | 100    | .....     | ...          | ...       | ...           | ...     | ...                       | ...                     | 100       | ...       | ...        | ...      | ...         |
| 2     | 150    | .....     | ...          | ...       | ...           | ...     | ...                       | ...                     | ...       | 150       | ...        | ...      | ...         |
| 3     | 50     | .....     | ...          | 50        | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 4     | 699    | .....     | 699          | ...       | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 5     | 250    | .....     | 200          | 50        | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 8     | 925    | 925       | ...          | ...       | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 11    | 500    | .....     | 500          | ...       | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 14    | 562    | .....     | ...          | ...       | 562           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| ..... | 273    | .....     | ...          | ...       | 273           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| ..... | 174    | .....     | ...          | ...       | 174           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 16    | 400    | .....     | ...          | ...       | 400           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 18    | 180    | .....     | ...          | ...       | 180           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 20    | 160    | .....     | ...          | ...       | 160           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 22    | 199    | .....     | 24           | ...       | 120           | 31      | ...                       | ...                     | ...       | ...       | 24         | ...      | ...         |
| 25    | 117    | 116       | ...          | ...       | 1             | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 28    | 24     | .....     | ...          | ...       | 24            | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 29    | 12     | .....     | ...          | ...       | ...           | 12      | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| ..... | 4      | .....     | ...          | ...       | ...           | 4       | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 32    | 172    | .....     | ...          | ...       | 172           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| ..... | 128    | .....     | ...          | ...       | 47            | 81      | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 33    | 6      | .....     | ...          | ...       | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | 6           |
| 34    | 200    | .....     | ...          | ...       | 200           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 37    | 238    | .....     | ...          | ...       | 238           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 38    | 150    | .....     | ...          | ...       | 150           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| ..... | 4      | .....     | ...          | ...       | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | 4           |
| 41    | 750    | .....     | ...          | ...       | 750           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 42    | 977    | .....     | 977          | ...       | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 43    | 358    | .....     | ...          | ...       | 358           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 45    | 1,500  | .....     | 1,500        | ...       | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 47    | 2,528  | 654       | ...          | ...       | 1,874         | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 49    | 50     | .....     | ...          | ...       | 50            | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 50    | 200    | .....     | ...          | ...       | 134           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | 66          |
| 53    | 250    | .....     | ...          | ...       | 250           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 55    | 100    | .....     | ...          | ...       | 100           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 57    | 100    | .....     | ...          | ...       | 100           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 59    | 750    | .....     | ...          | ...       | 750           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 60    | 250    | .....     | ...          | ...       | 250           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 61    | 50     | .....     | ...          | ...       | 50            | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 63    | 100    | .....     | 100          | ...       | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 64    | 1,000  | .....     | 200          | ...       | ...           | ...     | 800                       | ...                     | ...       | ...       | ...        | ...      | ...         |
| 65    | 1,000  | .....     | ...          | ...       | ...           | ...     | 1,000                     | ...                     | ...       | ...       | ...        | ...      | ...         |
| ..... | 2,000  | .....     | ...          | ...       | ...           | ...     | 2,000                     | ...                     | ...       | ...       | ...        | ...      | ...         |
| 66    | 9      | .....     | ...          | ...       | ...           | ...     | 9                         | ...                     | ...       | ...       | ...        | ...      | ...         |
| 67    | 1,000  | .....     | ...          | ...       | ...           | ...     | 1,000                     | ...                     | ...       | ...       | ...        | ...      | ...         |
| 69    | 1,124  | .....     | ...          | ...       | ...           | ...     | 1,124                     | ...                     | ...       | ...       | ...        | ...      | ...         |
| 70    | 100    | .....     | ...          | ...       | ...           | ...     | ...                       | 100                     | ...       | ...       | ...        | ...      | ...         |
| 71    | 24     | .....     | ...          | ...       | ...           | ...     | ...                       | 24                      | ...       | ...       | ...        | ...      | ...         |
| 72    | 114    | .....     | ...          | ...       | ...           | ...     | ...                       | 114                     | ...       | ...       | ...        | ...      | ...         |
| ..... | 32     | .....     | ...          | ...       | ...           | ...     | ...                       | 32                      | ...       | ...       | ...        | ...      | ...         |
| 73    | 24     | .....     | ...          | ...       | ...           | ...     | ...                       | 24                      | ...       | ...       | ...        | ...      | ...         |
| 74    | 100    | .....     | ...          | ...       | ...           | ...     | ...                       | 100                     | ...       | ...       | ...        | ...      | ...         |
| 75    | 30     | .....     | ...          | ...       | ...           | ...     | ...                       | 30                      | ...       | ...       | ...        | ...      | ...         |
| ..... | 12     | .....     | ...          | ...       | ...           | ...     | ...                       | 12                      | ...       | ...       | ...        | ...      | ...         |
| 76    | 100    | .....     | ...          | ...       | ...           | ...     | ...                       | 100                     | ...       | ...       | ...        | ...      | ...         |
| 77    | 50     | .....     | ...          | ...       | ...           | ...     | ...                       | 50                      | ...       | ...       | ...        | ...      | ...         |
| 78    | 100    | .....     | ...          | ...       | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | 100      | ...         |
| 79    | 50     | .....     | ...          | ...       | ...           | ...     | ...                       | ...                     | ...       | ...       | ...        | 50       | ...         |
| ..... | 20,509 | 1,695     | 4,200        | 100       | 7,367         | 128     | 5,924                     | 595                     | 100       | 150       | 24         | 150      | 76          |
| ..... | 1,695  | .....     | .....        | .....     | .....         | .....   | .....                     | .....                   | .....     | .....     | .....      | .....    | .....       |
| ..... | 18,814 | .....     | .....        | .....     | .....         | .....   | .....                     | .....                   | .....     | .....     | .....      | .....    | .....       |

Deduct--150 casks, July 25th, 1894. }  
 98 " August 27th, 1894. } 844 deduct.  
 584 " September 7th, 1894. }  
 844 12 " November 12th, 1894. }

17,970 Grand Total. \_\_\_\_\_

## Appendix No. 76.

## PAPERS—CONTRACT No. 72.

## No. 1.

The Council Clerk, Newtown, to The Secretary for Public Works.

Sir,

Borough of Newtown, Town Hall, 10 April, 1890.  
I have the honor, by direction of the Borough Council of Newtown, to ask you to be so good as to appoint a day to receive a deputation from the Councils of Newtown and Macdonaldtown for the purpose of considering the advisability of extending the present sewer from Munni-street to Shea's Creek.

I have, &amp;c.,

JESSE COWLEY,  
Council Clerk.

Say a report will first be obtained, then to Mr. Hickson.—J.B., 11/4/90. Mr. Hickson.—D.C.M'L. (*pro* U.S.), B.C., 15/4/90. Mr. Bagge.—P.H.F. (*per* W.S.), 17/4/90. Report herewith.—M.O.B., 11/6/90.  
Mr. Bagge's report herewith. This is one of the many storm-water sewers which are much required, but as I pointed out on a previous occasion, there are no funds, and to charge the work to the Western Suburbs Sewerage rate simply means that an excess will be required on that rate.—R.R.P.H., 13/6/90. Under Secretary.  
Perhaps it will be as well to get a comprehensive report on the question of storm-water sewers; it is hardly advisable to deal with it piece-meal. In the meantime, the Council to be informed of our action herein.—J.B., 17/6/90.  
Approved by Minister, 20 June, 1890.—J.B., 23/6/90. Inform, then to Mr. Hickson.—J.B., 23/6/90. Council Clerk, Newtown, 24/6/90. Mr. Hickson.—D.C.M'L. (*pro* U.S.), B.C., 28/6/90. Mr. Bagge to see me about this.—R.R.P.H., 28/6/90. I have seen the Engineer-in-Chief;—this work to be started when a vote has been passed for these surveys, &c.—C.H.O.B., 30/6/90.

## No. 2.

## Minute Paper.

Subject:—Temporary Occupation, Contract No. 72—Munni-street to Shea's Creek Storm-water Channel.

Department of Public Works, Sewerage Branch, Sydney, 27 January, 1891.

I FORWARD herewith a tracing of land which it will be necessary to occupy in connection with the construction of the above channel.

It will be seen from the papers that the lessees on Mr. William Cooper's property have given their written consent to the use of the land, but that Mr. J. R. Hill, as attorney for Mr. Cooper, refuses to do so.

I therefore enclose a notice to the owner, Mr. Cooper, in the usual form, which should be signed by the Minister, but not dated till the ground is actually required.

Mr. Bagge.

JAMES S. MOLLISON.

I beg to forward Mr. Mollison's minute *re* temporary resumption of land along the course of Munni-street storm-water channel, for the construction of which tenders are now invited.—C. H. OHLFSEN-BAGGE, 29/1/91. Engineer-in-Chief. Submitted.—F.C.P., 29/1/91. Mr. Bagge to see me.—R.R.P.H., 29/1/91. This land will eventually have to be resumed, but in order to let contractors on to it as soon as tender is accepted, temporary occupation is required.—R.R.P.H., 30/1/91. Under Secretary. Submitted signature.—J.B., 30/1/91. Please see that is done before letter is sent out.—J.B., 30/1/91. Quote Act in letter.—B.S., 30/1/91. R.R.P.H., 31/1/91. Mr. Mollison to carry out Minister's instructions.—F.C.P., 2/2/90. Act quoted and date filled in (March 5th, 1891). The letter and tracing should now be forwarded, as the contractors are about to commence work.—J.S.M., 5/3/91. Mr. Bagge. Mr. Piper please have this notice issued without delay.—C. H. OHLFSEN-BAGGE, 5/3/91. Letter delivered by Messenger Walsh to Mr. Hansard in Mr. Hill's office.—F.C.P., 5/3/91.

## No. 3.

## List of Tenders.

Number of tenders received, 12; amount of lowest tender, £20,650; name of lowest tenderer, Carter & Co.

| No. | Name.                                 | Amount of Tender. | Amount of De | Nature of Deposit. |
|-----|---------------------------------------|-------------------|--------------|--------------------|
| 1   | Carter & Co. ....                     | £ 20,650 0 0      | £ 207 0 0    | Cheque.            |
| 2   | Phippard Bros. ....                   | 21,386 18 11      | 214 0 0      | "                  |
| 3   | Jas. Atherton.....                    | 21,886 1 6        | 219 0 0      | "                  |
| 4   | Parry and Farley .....                | 23,445 0 0        | 230 0 0      | "                  |
| 5   | A. McSweeney .....                    | 23,977 0 6        | 240 0 0      | Cash.              |
| 6   | C. B. Bond .....                      | 24,989 9 0        | 240 0 0      | Cheque.            |
| 7   | James Flood .....                     | 25,569 0 0        | 260 0 0      | "                  |
| 8   | C. Richards .....                     | 25,600 0 0        | 250 0 0      | "                  |
| 9   | Gummow and Gillan .....               | 25,995 0 0        | 260 0 0      | "                  |
| 10  | John Shunn .....                      | 28,205 7 0        | 282 0 0      | "                  |
| 11  | H. A. Brigg & Coy. ....               | 28,220 0 6        | 280 0 0      | "                  |
| 12  | Murray and Stuart—received late ..... | 28,693 10 11      | 300 0 0      | "                  |

I recommended acceptance of Carter & Co.'s tender at schedule rates.  
23/2/91.

R. R. P. HICKSON.

## No. 4.

The Principal Assistant Engineer for Sewerage to The Engineer-in-Chief.

Subject:—Temporary Occupation—Munni-street to Shea's Creek Storm-water Sewer.

Department of Public Works, Sewerage Branch, Sydney, 14 March, 1891.

HEREWITH I forward a notice of temporary occupation for the signature of the Minister.

The portion to be occupied is required for a temporary outlet to the Munni-street to Shea's Creek storm-water channel, pending the construction of the canal, being undertaken by the Harbours and Rivers Department. The whole of this portion will have to be resumed when the canal is continued as proposed, and the temporary occupation will be required till that is done.

C. H. OHLFSEN-BAGGE.

Submitted.—F.C.P., 16/3/91. Under Secretary.—R.R.P.H., 16/3/91. Submitted.—D.C.M'L. (*pro* U.S.), 18/3/91. Letter signed by the Colonial Treasurer and returned herewith.—D.C.M'L. (*pro* U.S.), B.C., 18/3/91. Roads. Letter delivered by Messenger F. Walsh, 19/3/91. Mr. Davis to note.—F.C.P., 24/3/91. Noted.—J.D., 24/3/91.

Permission

Permission to enter properties for the construction of the Munni-street and Macdonaldtown Park Storm-water Sewer. From the report made by Mr. Liddell, it would seem that Mr. J. R. Hill, attorney for Mr. Wm. Cooper, is the only owner on the line of the Munni-street sewer who refuses permission to enter. The other owners and Mr. Cooper's tenants have all given written permission.

I presume that over the portions not under lease temporary occupation will have to be taken, and I would recommend that a tracing and notice should be served on Mr. Hill at once.

JAMES S. MOLLISON,  
12/1/91.

Mr. Bagge.

Mr. Mollison to prepare the necessary tracings and papers.—C.H.O.-B., 12/1/91.

### Minute Paper.

*Subject* :—Lands along the course of the Macdonaldtown Storm-water Sewer.

Department of Public Works, Sewerage Branch, Sydney, 6 January, 1891.

THE names of the owners and occupiers of private land through which the line of the proposed Macdonaldtown storm-water sewer passes have been ascertained, and the parties have been interviewed after considerable trouble, and I have to report as follows :—

1st. The land coloured brown on the accompanying tracing is part of the Waterloo Estate, in the borough of Alexandria. It is the property of Mr. Wm. Cooper, for whom Mr. J. R. Hill, of the United Chambers, corner of George and Hunter Streets, is the agent and attorney.

2nd. The occupiers are Messrs. Eaves Bros. (boiling-down), W. Wilkinson (carter), and Thos. Green and Sons (boiling-down). I obtained the consent of Green and Sons and W. Wilkinson to the use of their holdings for the purposes of the construction of the sewer, and their written consent is appended. Messrs. Eaves Bros. promised to give every facility for carrying on the work, but would not give a promise in writing, as they are only tenants at will. Their holding is very little affected by the course of the sewer.

3rd. I waited upon Mr. J. R. Hill, the attorney for Mr. Cooper, and requested permission to open up and cart over that portion of the Waterloo Estate through which the sewer passes, and explained fully to him the objects and advantages of the work, and also pointed out that the surplus material excavated would be used for filling in the creek and drains and equalising the surface of the ground. Mr. Hill admitted that the estate, in common with adjoining properties, would benefit largely by the work, but nevertheless refused emphatically to give the required permission, saying that "he would make no concessions to the Government other than those which the law would compel him to make."

4th. The land coloured pink on the accompanying tracing is the property of Mr. Stephen J. Bryen, of "Lynwood," Avoca-street, Randwick, and is occupied as a grazing paddock by Mr. H. Knight. Mr. Knight promised to give every facility for carrying out the work. I then called upon the owner, Mr. Bryen, at Randwick. He promised to consider the matter and communicate with me yesterday (5th instant), but up to the present has not done so.

5th. The land intervening between Toogood-street and Campbell-street, coloured blue on the tracing, is the property of Mr. Jno. Goddard, of Harold-street, Macdonaldtown, and is mortgaged, I am informed, to Mr. C. B. Pitt, solicitor, of Tattersall's Chambers, Hunter and Castlereagh Streets. Mr. Pitt expressed himself willing to consent to Mr. Goddard granting the permission required. I waited on Mr. Goddard, who would not do anything in the matter without consulting Mr. Pitt. Mr. Goddard requested me to meet him at Mr. Pitt's office at noon to-day (6th instant).

6th. I have examined the deed of grant of Cooper's Waterloo Estate, and find that the watercourses are included in the grant. There are certain conditions attached to the grant, one of which reserves to the Crown the right to a highway through the estate, but none of them cover any drainage or sewerage rights.

7th. I suggested to the Mayor and Council Clerk of Macdonaldtown, in the first instance, that they should conduct negotiations with the people through whose land the sewer passes, but they stated that owing to somewhat unfriendly relations existing between the Borough Council and the parties concerned it would be better for the Department to deal with them.

I have, &c.,  
AND. T. LIDDELL.

### No. 5.

### Minute Paper.

*Subject* :—Contract No. 72, Sydney Sewerage Works.

Department of Public Works, Bonds and Contract Branch, Sydney, 19 March, 1891.

THE bond herein duly prepared has been executed by the contractors, Messrs. Carter & Co., and stamped, and may now be forwarded to the Engineer-in-Chief for Sewerage. The tender and all other papers herein are sent herewith.

HAROLD F. NORRIE,  
Officer-in-Charge.

Commissioner for Roads.—D.C.M'L. (*pro* U.S.), B.C., 19/3/91. Mr. Davis to see.—F.C.P., 20/3/91.

### TENDERS FOR PUBLIC WORKS.

Department of Public Works, Sydney, 13 February, 1891.

Tenders will be received at this office for the public works specified in the Schedule hereunder, up to 11 o'clock a.m., of the various dates set forth in the second column.

All envelopes containing tenders must be addressed to the President of the Tender Board, and have legibly endorsed upon them the name of the work for which the tender is submitted.

Tenderers may be in attendance when the tenders are opened, and the name of the lowest tenderer will be announced, if possible, before the duties of the Board have terminated.

The following conditions will have to be strictly complied with, otherwise the tenders will not be taken into consideration :—

- 1st.—Each tender must state the time within which it is proposed to complete the work, and in every instance the full name or names of person tendering, also the names in full, occupations, and addresses of proposed bondsmen.
- 2nd.—At the foot of every tender there must be a memorandum, signed by the party tendering and two responsible persons as sureties, agreeing to be answerable for the due performance of the contract, in the event of the tender being accepted; and undertaking, in that event, that they will severally execute and deliver a bond to Her Majesty, in the penal sum mentioned in the specification, or otherwise arranged, for securing such performance.
- 3rd.—No tender will be considered which shall have been received after 11 o'clock a.m. on the day upon which tenders are to be received, unless there are circumstances which, in the opinion of the Board, render it desirable that it should be received.
- 4th.—Every tender must, as a guarantee of good faith, be accompanied by a preliminary deposit, calculated according to the following scale, viz. :—

|   |         |
|---|---------|
| For amounts up to £500 inclusive .....                    | £5 0 0  |
| For amounts exceeding £500 and not exceeding £1,000 ..... | £10 0 0 |

For all sums over £1,000, 1 per cent of the amount of tender up to a maximum deposit of £500. Such deposit to be in the form of a cheque in favour of the President of the Board, endorsed by the manager of the bank upon which it is drawn, or a bank draft.

- 5th.—Any tender which may be received without such preliminary deposit shall, unless otherwise directed by the Board, be deemed to be informal and rejected accordingly.

6th.—

- 6th.—In the event of any tenderer failing to take up his tender, complete the bond, and proceed with the contract within the time specified, or withdrawing his tender after it shall have been opened, whether such tender shall have been accepted or not, all moneys deposited by him on account of such contract shall be absolutely forfeited to the Crown, and shall be paid to the credit of the Consolidated Revenue of the Colony.
- 7th.—Whenever a tenderer shall fail to proceed with a contract as aforesaid, fresh tenders shall be invited at short notice for the work, unless in the opinion of the President there are circumstances which make it desirable for another tender in the same series to be accepted, but the tenderer by whose default such a course has been rendered necessary shall be excluded from the competition, and from any competition for other works, at the pleasure of the President.
- 8th.—In the event of any contract being tendered for at a schedule of rates, the approximate quantities as given of each item must be worked out and a total sum shown.

All deposits, with the exception of that of the lowest tenderer, when practicable, will be returned to the persons entitled thereto, immediately after the Board shall have adjourned; and the deposit made by the successful tenderer shall be returned to him on executing the bond for the fulfilment of the contract. When the contract is for a less sum than £200, the deposit with tender will not be returnable until the service is satisfactorily completed.

It is to be understood that the Government does not bind himself to accept the lowest or any tender; and no tender will be accepted until the head of the branch under whose directions the work is to be carried out has reported upon the whole of the tenders received.

BRUCE SMITH

ROADS.

| Description of Work or Supplies to be Tendered for.  | Dates up to which Tenders will be received. | Where Plan, Specification, and Form of Tender may be seen. | Remarks.                 |
|--|---|--|--------------------------|
| * * * * *  | * * *                                       | * * * * *  | * * *                    |
| Construction of a Storm-water Sewer, Munni-street to Shea's Creek, Contract No. 72, Sydney Sewerage Works. | 18 Feb., 1891 ...                           | Sewerage Office, Lincoln's Inn Chambers, Elizabeth-street. | See also special notice. |
| * * * * *  | * * *                                       | * * * * *  | * * *                    |

This is the copy notice referred to in our annexed agreement with Her Majesty the Queen, dated the 16th day of March, A.D. 1891.

JOHN CARTER.  
D. G. SNODGRASS.  
GEO. FORREST.

Witness—HAROLD F. NORRIE.

“C.”

TENDER FOR CONTRACT NO. 72, SYDNEY AND SUBURBS STORM-WATER DRAINAGE.

To the Honorable the Minister for Public Works, Bridge-street, Sydney, N.S.W.

We, the undersigned, do hereby tender and offer to construct, completely finish, and maintain the various works for Contract No. 72, Sydney and Suburbs storm-water drainage, in accordance with the conditions of contract, specifications, and drawings prepared for that purpose in your department, for or at the rates particularly entered in the accompanying schedule of prices, and enclose herewith Treasury deposit, as required by clause 20 of the General Conditions.

Should this tender be accepted, we undertake to lodge with the Under Secretary for Public Works, within seven days from the date of notification of acceptance of this tender, a bank deposit receipt, in the name of the Secretary for Public Works, for the sum of £900 sterling, as security for the due performance of the contract.

In the event of our failing to do so, or to sign the required contract within the time specified in clause 20 of the General Conditions, we hereby distinctly agree to forfeit to the Queen the sum deposited with this tender.

CARTER & CO.,  
St. John's-road, Glebe.  
JOHN CARTER,  
Glebe.  
D. G. SNODGRASS,  
Glebe.  
GEORGE FORREST,  
Glebe.

18 February, 1891.

This is the tender marked “C,” referred to in our annexed agreement with Her Majesty the Queen, dated the 16th day of March, A.D. 1891.

JOHN CARTER.  
D. G. SNODGRASS.  
GEO. FORREST.

Witness—HAROLD F. NORRIE, J.P.

CONTRACT No. 72.—Schedule of quantities and prices for constructing and completing concrete and stoneware pipe storm-water sewer, from Munni-street along Macdonald-street to Mitchell-road and Shea's Creek, with manholes, flushing-chambers, junctions, &c., subject to omissions, additions, deviations, or alterations, as provided. The quantities in this schedule are not guaranteed as correct, but are merely given for the guidance for intending contractors, this being a Schedule of Prices Contract.

| No. of item. | Description of Works.   | Unit.      | Probable quantity, | Rate per unit. | Amount.     |
|--------------|---|------------|--------------------|----------------|-------------|
| 1            | General excavation in open trenches for sewers, junctions, curves, manholes, pipe-drains, &c., including grubbing, clearing, timbering, unwatering, road-restoring, coffer-dam, removing of old stone abutments and timber-decking of existing road bridge, depositing the excavated materials beyond actual site of works in separate spoil-banks, complete, as specified in clauses 34 to 36, and 37 to 54, inclusive ...   | cubic yard | 26,200             | 2/6            | £ 3,275 0 0 |
| 2            | Filling in below, at sides, and over sewers, junctions, curves, manholes, into abandoned open channels, road embankment, &c., including the providing of quarry filling, lead from sites of excavations or temporary spoil-banks, or any other sources outside the limits of this contract, to the place of permanent deposit, breaking, road-restoring, ramming, watering, leading surplus and rejected material to spoil, as specified in clauses 47, 50, 51, 53 to 62, inclusive ... | „          | 12,000             | 1/-            | 600 0 0     |



| No. of Item        | Description of Works  | Unit        | Probable quantity | Rate per Unit | Amount            |
|--------------------|---|-------------|-------------------|---------------|-------------------|
| 3                  | Sodding at both sides of new channels, and where ordered, complete, as specified in clause 63   | square yard | 1,000             | 1/-           | £ 50 0 0          |
| 4                  | Brickwork, any thickness, shape, arched, &c, where ordered, in any situation, as specified in clauses 96 to 99  | cubic yard  | 110               | 80/-          | 440 0 0           |
| 5                  | Sandstone concrete, any shape, form, thickness, arched, &c, where ordered, in any situation, as specified in clauses 78 to 95 in clusive  | "           | 8,100             | 34/-          | 13,770 0 0        |
| 6                  | Cement facing, 5/8 inch thick, where ordered, in any situation, as specified in clauses 112   | square yard | 11,600            | 2/6           | 1 450 0 0         |
|                    | Providing, laying, and joining glazed stoneware plain pipes, in trenches, and where ordered, including fixed discs, as specified in clauses 16, 40 42, 44, and 73 to 77 —   |             |                   |               |                   |
| 7                  | 24 inches internal diameter   | lineal foot | 250               | 15/-          | 187 10 0          |
| 8                  | 21 " "  | "           | 20                | 12/-          | 12 0 0            |
| 9                  | 18 " "  | "           | 550               | 7/-           | 192 10 0          |
| 10                 | 12 " "  | "           | 20                | 5/-           | 5 0 0             |
| 11                 | 9 " "   | "           | 20                | 3/-           | 3 0 0             |
| 12                 | 6 " "   | "           | 20                | 2/-           | 2 0 0             |
| 13                 | Less than 6 inches internal diameter  | "           | 20                | 2/-           | 2 0 0             |
| 14                 | Providing and fixing in position hardwood timber in piles, walings, sheet piling, including ironwork, as specified in clause 71   | cubic foot  | 600               | 4/-           | 120 0 0           |
| 15                 | Providing and fixing in position hardwood timber in platform, including ironwork, as specified in clause 70, where ordered  | "           | 600               | 3/-           | 90 0 0            |
| 16                 | Timber, ordered in writing, to be left in excavations, as specified in clause 43, including all iron used in fixing same  | "           | 600               | -/6           | 15 0 0            |
| 17                 | Sandstone pitchers, laid where ordered, as specified in clause 114  | square yard | 40                | 15/-          | 30 0 0            |
| <b>IRONWORK</b>    |   |             |                   |               |                   |
| 18                 | Providing, delivering, and fixing in position girders, including bedding same on special mortar, as specified in clauses 91 and 102 to 107  | cwt         | 74 cwt 22 lb      | 25/-          | 92 14 11          |
| 19                 | Providing, delivering, and fixing cast iron gratings, as specified and shown on drawing No 5, weighing 4 cwt each, as specified in clauses 90 and 108 to 111  | each        | 32                | 90/-          | 144 0 0           |
| 20                 | Cast iron ventilating grates, with square frames, 22 inches diameter internal opening, tarred sawn hardwood bricks in centre, fitted into panels, circular dirt box 8 inches deep, complete, as shown on drawing No 5, and as specified in clauses 90 and 108 to 111, placed in position, weighing each about 9 cwt | "           | 6                 | 200/-         | 60 0 0            |
| <b>GENERAL</b>     |   |             |                   |               |                   |
| 21                 | Special bluestone concrete (clause 26) where ordered in any situation, in the construction of these works   | cubic yard  | 5                 | 60/-          | 15 0 0            |
| 22                 | Permanent puddle, where ordered in any situation in the construction of these works (temporary puddle ordered for purposes of execution of work not to be paid for)   | "           | 5                 | 2/6           | 0 12 6            |
| 23                 | Bluestone metal (clause 19) 1 1/2-inch gauge, stacked   | "           | 5                 | 15/-          | 3 15 0            |
| 24                 | Bluestone metal (clause 31) 2 1/2 inch gauge, stacked   | "           | 5                 | 14/-          | 3 10 0            |
| 25                 | Sharp, clean washed sand, stacked   | "           | 5                 | 4/-           | 1 0 0             |
| 26                 | Oregon timber, in scantlings or planks  | cubic foot  | 100               | 2/-           | 10 0 0            |
| 27                 | Wrought iron in bolts, screws, nails, spikes, and galvanized step irons   | lb          | 1,000             | /6            | 25 0 0            |
| 28                 | Portland cement   | cask        | 5                 | 20/-          | 5 0 0             |
| 29                 | Artisan or mechanic, supplied by contractor   | day         | 10                | 15/-          | 7 10 0            |
| 30                 | Quarryman or other skilled labourer, supplied by contractor   | "           | 10                | 10/-          | 5 0 0             |
| 31                 | Ordinary labourer, supplied by contractor   | "           | 10                | 10/-          | 5 0 0             |
| 32                 | Cart, with one horse and driver, supplied by contractor   | "           | 5                 | 20/-          | 5 0 0             |
| 33                 | One additional horse, supplied by contractor  | "           | 5                 | 10/-          | 2 10 0            |
| <b>MAINTENANCE</b> |   |             |                   |               |                   |
| 34                 | Three months' maintenance after formal delivery of works  | lump sum    |                   |               | 20 7 7            |
| <b>Total</b>       |   |             |                   |               | <b>20 650 0 0</b> |

## Notes

1 All work herein enumerated shall be understood as being placed in position where specified and ordered, and in complete working condition, in accordance with the specification

2 The above schedule prices include, in every case, continual maintenance of the works during the whole time of construction, and up to the day of their being formally taken over by the Engineer

3 Prices for items Nos 29, 30, 31, 32, and 33 are to be for such as are able bodied and efficient. The schedule rates per day are for the day of eight hours. In the event of overtime and night work being ordered, it is to be paid for at 25 per cent advance on the time rates set down for day work

4 The whole of the foregoing prices to include all labour, tools, implements, plant, machinery, shoring, timbering, centering, concrete boxes, unwatering, coffer dams, fluming, temporary bridges, roads, pumping, gasket filling, diverting watercourses and surface water, diverting and maintaining the traffic along roads, crossing over pipe sewers, disposal and removal of surplus soil, reinstating all roads and other surfaces, &c, and any other thing necessary in executing and completing each respective item, in accordance with plans and specifications

5 Tenderers are to state prices for all items, whether quantities are given or not

This is the schedule of quantities and prices referred to in our annexed agreement with Her Majesty the Queen, dated the 16th day of March, A D 1891.

Witness—HAROLD F NORRIE, J P

JOHN CARTER  
D G SNODGRASS  
GEO. FORREST

## " A. "

SPECIFICATION of the several works required in the construction of a storm-water channel commencing at junction of Union and Munni streets, and extending, more or less, along the line of creek to Macdonald-street and along this street; thence south along the course of the creek to its intersection with Mitchell Road; thence again in a southerly direction along the course of the creek to the northern angle of a Chinese garden, and thence in an easterly direction across a slight ridge to Shea's Creek, being a total distance of 77·38 chains, together with all manholes, junctions, &c., connected therewith, in accordance with the accompanying drawings, with such extensions or omissions as may be ordered in writing, viz. :—

1. *Description of Drawings.*

1. Drawing No. 1.—General plan and longitudinal section.
- „ No. 2.—Cross sections.
- „ No. 3.—Details of inlets, cross sections of channel, manholes, outlet-end, piling, plank-floor, &c.
- „ No. 4.—Details of large junction, intersection with 18-inch pipe-sewer, inlets, &c.
- „ No. 5.—Details of wrought-iron girder, cast-iron ventilating and other gratings.

2. *Extent of Contract.*

2. The works comprised in this contract consists in the necessary excavation, shoring, timbering, piling, unwatering, concrete, brickwork, stonework, rendering, re-filling, pipe-laying, carpenter's work, ironwork, pitching, paving, ballasting, metalling, leading surplus materials to spoil, &c., required in the construction of the following, viz. :—

|                      |           |   |                                 |
|----------------------|-----------|---|---------------------------------|
| From Shea's Creek to | 20 chains | open channel  | 11 ft. 6 in. x 7 ft. 6 in.      |
| „ 20 chains to       | 28 „      | oval sewer  | 10 ft. 6 in. x 6 ft. 6 in.      |
| „ 28 „ to            | 39·12 „   | „ „   | 10 ft. 6 in. x 6 ft.            |
| „ 39·12 „ to         | 39·77 „   | junction of two creeks, with flat concrete decking between wrought iron rolled girders. |                                 |
| „ 39·70 „ to         | 48·17 „   | oval sewer  | 7 ft. 2 in. x 6 ft.             |
| „ 48·17 „ to         | 58 „      | circular sewer of   | 6 ft. internal diameter.        |
| „ 58 „ to            | 62·50 „   | „ „ of  | 5 ft. 10 in. internal diameter. |
| „ 62·50 „ to         | 66 „      | „ „ of  | 5 ft. 2 in. internal diameter.  |
| „ 66 „ to            | 72 „      | „ „ of  | 3 ft. internal diameter.        |
| „ 72 „ to            | 76·58 „   | „ „ of  | 2 ft. 6 in. internal diameter.  |

in open cutting in mud, sand, loam, clay, shale, and ironstone, as shown on longitudinal section, and as shall be directed, with all branches, junctions, curves, manholes, flushing chambers, sub-ducts, road-making, and all other works in connection with those herein enumerated, and the maintenance of the whole of the works for a period of three months after they have been formally taken over by the Engineer.

3. It is to be understood that the lower 13 or 27 chains of the channel shall not be constructed until the Engineer gives a written order to that effect; and the Engineer shall have the power to suspend the execution of these portions of the work, or any other part of the contract, or to reduce the length of the contract by the extent of the said 13 or 27 chains, or any other part of the sewer shown on the drawings, that he may consider necessary, and the contract shall not thereby be invalidated, nor shall the contractor be entitled to any compensation on account of such temporary suspension of any part or parts of the contract or permanent reduction of same.

4. Supply of materials, &c.—Contractor to supply, at his own expense, all labour, plant, and materials of any sort whatever for the due performance of the contract.

3. *Site.*

5. Access to the site of the works to be had along centre lines where such are shown to be along lines of streets, and along all public roads which cross the centre lines of the Munni-street to Shea's Creek storm-water channel.

6. For the purpose of excavating open cuttings, where ordered, for sewers, &c., and for constructing and completing the various works therein, contractor to have temporary possession of a strip of land the exact widths which in the opinion of the Engineer is required for these works.

7. All areas of strips of land hereinbefore referred to to be set out by the Engineer, to whom written application for their temporary possession must be made by the contractor two weeks prior to the time the said land is required by him.

Such possession, however, not to be exclusive, but subject to the right of entry of the Engineer, his officers, and other persons, carts and horses, &c., required for any purposes of the Government at any time.

8. Any other lands required by the contractor for temporarily depositing materials, or for any other purposes in connection with the contract, he will have to procure at his own cost, in strict accordance with clause 6 of the conditions of contract.

9. The contractor shall provide and erect all necessary fences, temporary bridges over the open trenches, where directed, for the use of residents through whose ground the sewer has to be built, and underneath tramways, footpaths, and streets, hoarding-barriers, &c., wherever directed to do so, and all fences, walls, railings, walks, or streets, metalled, grassed, paved, pitched, or asphalted surfaces, to be left by the contractor at the completion of the works in the same order as they were before the commencement of the works, at his sole cost, in strict accordance with the various stipulations and terms contained in this specification, and in clause 2 of the conditions of contract, to the entire satisfaction of the city or municipal authorities, and of the Engineer-in-Chief.

4. *Lines, Levels, and Setting-out Work.*

10. The centre lines of main sewer and branch sewers are shown on general plan, drawing No. 1, by full red lines, which will be marked on the surface of the ground, the same as on plan, as the works proceed.

After setting out, the centre lines of the works are to be preserved solely by reference to the iron nails, pegs, and other marks and signals which may be placed, fixed, and erected for the purpose of these works along their centre lines.

The gradients and levels of the works are to be preserved by reference to any bench-marks, which the Engineer may deem necessary to establish along the lines of works during the progress of the contract, subject to check and adjustment, as shall be directed, from other bench-marks established beyond the site of the works.

5. *Materials.*

11. All materials, as brick, stone, cement, timber, iron, sand, stoneware pipes, clay, lead, &c., which are to be supplied by the contractor, are to be of the best quality and description of their respective kinds. Samples of each kind to be submitted for the approval of the Engineer, and retained in office; and on approval having been obtained, they are to be delivered on the works ready for use, as per sample.

12. The contractor shall inform the Engineer of the sources whence the various materials are supplied, or of the places of their manufacture, and afford him every facility to inspect their supply or manufacture at any stage of the same.

13. The contractor to make and provide proper and approved gauges or scales for measuring or weighing all materials supplied, whether specified to be broken or delivered to special sizes, and mixed together in stated proportions or not.

14. Bricks to be of well-mixed material of approved quality and uniform fineness, to be new, sound, hard, well-burnt kiln bricks, free from cracks and all other defects, truly rectangular, with sharp arrises, of approved dimensions and form, to be specially moulded where required for arching inner and outer rings of sewer and circular or segmental shafts, and equal to sample bricks to be seen at the Engineer's office and which must be sealed by the contractor and acknowledged as a sample of the bricks to be used throughout the works. Bricks used in these works will be subjected to the following tests, viz. :—

(a) *Tensile strength.*—The tensile strength to be tested, in the departmental testing machine, by laying the brick horizontally on its base of 3 inches between supports 7 inches apart, and the strain applied across the centre of the brick and distributed over a width  $1\frac{1}{2}$  inch. An average breaking strain of twelve bricks to be taken, which must not be less than 8,000 lb.

(b) *Porosity.*—Bricks immersed in water for twenty-four hours must not increase in weight more than 3 per cent.

Should the twelve bricks fracture under the foregoing average strain, or prove more impervious to water than 3 per cent., then the Engineer may reject the whole stack of bricks from which the twelve bricks were taken. The whole of the expense incurred in testing the bricks shall be borne solely by the contractor.

15. In the event of the contractor delivering quantities of bricks on the site of the works for the contract of a mixed description and quality, the officer in charge shall have the power to require of the contractor to have those bricks which, in his opinion, are suitable for the works picked out and stacked where directed, and those defective or unsuitable removed from the site of the contract; and in the event of the contractor refusing or failing to comply with such request within twelve hours from the time it has been made, then in all such cases the Superintending Officer shall have the power of rejecting the whole of the bricks so delivered by the contractor.

16. Stoneware pipes to be of well ground and mixed material, of tough, tenacious, impervious quality, well burnt, sound, hard, uniform in thickness, true in section, straight longitudinally, uniformly glazed both inside and outside, free from fire or other cracks, flaws, and ash-holes, the collar perfectly joined to the barrel, and in every way equal to sample pipe to be seen at the Engineer's office. Paving tiles to be of the same materials as the stoneware pipes, to be uniformly glazed on all sides and of approved size and form.

Pipes to be of the following thicknesses and depth of collar, namely:—

|                         |           |            |                      |                      |           |
|-------------------------|-----------|------------|----------------------|----------------------|-----------|
| Pipes, inside diameter, | 9 inches; | thickness, | $1\frac{5}{8}$ inch; | depth of collar,     | 2 inches. |
| Do                      | do        | 12 inches; | do                   | 1 inch;              | do        |
| Do                      | do        | 15 inches; | do                   | $1\frac{1}{4}$ inch; | do        |
| Do                      | do        | 16 inches; | do                   | $1\frac{3}{8}$ inch; | do        |
| Do                      | do        | 18 inches; | do                   | $1\frac{1}{2}$ inch; | do        |
| Do                      | do        | 21 inches; | do                   | $1\frac{5}{8}$ inch; | do        |
| Do                      | do        | 24 inches; | do                   | $1\frac{3}{4}$ inch; | do        |

All parcels of pipes used in these works will be tested in the departmental testing machine, and submitted to the following crushing strains applied in the centre of the pipe:—

|                          |   |
|--------------------------|---|
| 24-inch diameter pipe at | 110 lb. per square inch of bearing surface. |
| 18-inch do               | 100 lb. do do.                              |
| 16-inch do               | 100 lb. do do.                              |
| 12-inch do               | 100 lb. do do.                              |
| 9-inch do                | 100 lb. do do.                              |

If the Engineer deems it necessary, the pipes will also be tested for porosity. Should the pipes fracture under the foregoing strains, or not prove impervious to water, then the Engineer may reject the whole of parcel from which the pipes were taken. The whole of the expense incurred in testing the pipes shall be borne solely by the Contractor, and all pipes injured or broken by the testing shall be immediately replaced by sound pipes, subject to the foregoing tests, at Contractor's cost.

17. Stone.—All stone used in the construction of these works for pitchers or masonry, unless where otherwise specified, to be sound, solid, hard sandstone, of the best description, free from all defects, and as per sample approved.

18. Broken stone for ballast to be sound, solid stone, as specified in clause 17; to be broken to a size to pass freely with its largest dimensions through a ring of 4 inches in diameter. Broken stone for packing round sewer-lining, above drains, &c., to be sound and solid, and broken to the same size as ballast.

19. Broken stone for bluestone concrete to be of basalt or other similar hard stone of approved quality; to be broken by hand or crushing machine, of a size to pass freely with its largest dimensions through a ring of  $1\frac{1}{2}$  inch in diameter; the whole of the metal to be free from dirt, quarry refuse, &c.; to be screened through a sieve of meshes  $\frac{1}{2}$  inch apart, and then to be washed with fresh water until approved, before it shall be deemed fit and suitable for these works.

20. Sand to be sharp quartz sand of approved quality, free from all carthy, loamy, clayey matter, &c., and washed perfectly clean whenever the Engineer deems it necessary.

21. Cement.—The cement to be used throughout these works to be the best Portland cement, of approved brands and manufacture, free from hard or set lumps, and no barrel or portion of same to be used until it has been examined and approved by the Engineer. Samples from each parcel brought on the works to be submitted for testing:—The weight per struck bushel not to be less than 100 lb., and not to exceed 116 lb. The specific gravity not to be less than 3.08. The cement, when passed through a wire sieve of 2,500 meshes per square inch, to leave a residue of not more than 10 per cent., through a sieve of 5,800 meshes not more than 25 per cent., and through a sieve of 14,400 meshes not more than 40 per cent. The cement, when mixed neat with  $16\frac{1}{2}$  per cent. by weight of water, to give a tensile strength of not less than 250 lb. per square inch after three days' setting in water, 445 lb. after seven days, and 550 lb. after twenty-eight days. The cement is to be "slow setting" unless a quick setting cement is specially ordered. The cement, when mixed in the proportion of 1 of cement to 3 of standard sand, and 10.6 per cent. of the total weight of water, to give a tensile strength of not less than 100 lb. per square inch at seven days, and from 200 to 230 lb. at twenty-eight days. The tensile strength will be ascertained in the departmental testing machine, with the load increasing at the rate of 200 lb. per minute, and the average breaking weight of six briquettes will be taken for each test. Should the sample fail in any or all of these tests, or not show a proper progressive increase in strength with age of briquette, then the Engineer may reject the whole parcel from which the sample was taken, and the Contractor shall at once remove the said parcel of cement from the site of the works at his own expense; failing which, the Engineer may have it removed at the Contractor's cost without further notice. Empty casks to be destroyed, as provided in clause 14 of the General Conditions. To facilitate the gauging of cement throughout the Contract, cement casks will be taken as equal to holding 4 cubic feet, otherwise the Contractor to provide and make approved gauge boxes, holding exactly 4 cubic feet, for measuring cement. Cement of a lighter weight than herein stipulated, but otherwise equal to the specified test, may be permitted to be used in the works, subject to the decision of the Engineer-in-Chief, and provided that the deficiency in weight is made up in quantity.

22. Mortar.—The mortar to be used in these works to be composed of one part of Portland cement and of two parts of clean washed sharp sand, as described in clauses 20 and 21, the proportion of each to be correctly ascertained by measurement; the whole to be mixed with fresh water, as may be directed, to be well incorporated, and to be used fresh. Any mortar which has become hard or set to be at once rejected. All mortar to be mixed upon approved sawn timber platforms, close to where it is required.

23. Special mortar, composed of one part of cement and one part of sand, and prepared as before described, to be provided and used in all portions of the work where especially specified and directed.

24. Grout.—The grout to be made of mortar, as described in clause 23, to be mixed fluid in tubs close to where it is required, and to be used fresh.

25. Bluestone concrete.—The concrete to be used in these works to be composed of 1 part of Portland cement, 2 parts of sand, and 4 parts of bluestone metal.

26. Special concrete, if required, to be composed of 2 parts of Portland cement, 3 parts of sand, and 7 parts of bluestone metal.

27. Sandstone concrete, where ordered to be used in these works, to be composed of 1 part of Portland cement, 2 parts of sand, and 5 parts of sandstone (as specified under clause 17) metal, free from dirt, quarry refuse, sieved (as specified in clause 19), washed, and of a size to pass with its largest dimensions through a ring of 2 inches in diameter. All materials to be mixed in the same manner as hereinafter specified for concrete.

28. Puddle to consist of the best clay to be obtained in the district within a radius of 5 miles; to be carefully turned over and mixed with fresh clean water, as shall be directed, until the clay, in the opinion of the Engineer, has become of one even and uniform colour and plasticity.

29. Hardwood timber to be ironbark, blue or red gum, box, or other approved colonial hardwood, of the best description, sound, straight, free from sap, wanes, shakes, gum-veins, cores, or other defects; to have clean sharp arrises, and to be of the fullest dimensions shown or specified; in round timber, the diameter given is to be measured at the smallest end, exclusive of bark.

30. Wrought-iron.—All wrought-iron work to be of the best description, quality, and workmanship, with square arrises, and of the exact dimensions and forms shown on Drawings. All wrought-iron to be double H. or B.B. Crown brand, and all ironwork, when finished, to be heated and then dipped in or coated with gas-tar.

31. Bluestone road-metal.—The stone used for metalling to be basalt or other similar hard stone of approved quality; to be broken to angular fragments of a size to pass freely with their largest dimensions through a ring  $2\frac{1}{2}$  inches in diameter, and to be free from dirt, quarry refuse, &c.

32. Bluestone.—All bluestone used in the construction of these works for pitchers or masonry to be of the best description of basaltic bluestone obtainable, free from honeycomb and all defects, and as per sample approved.

6. General.

33. Earth-borings have been taken along or close to the line of sewer, the results of which are described on drawing No. 1; but no guarantee is given that the ground to be excavated will be free from subsoil water, or that the proportion of materials will correspond with that shown on longitudinal section, or that there will be more or less subsoil water than indicated.

34. Diverting surface water and unwatering.—The prices set forth in schedule accompanying tender for the works comprised in this contract to cover and include the cost of all materials and labour, and everything that is necessary for executing the works of every description required for the proper and effectual deviation of all creek, surface, and subsoil drainage from the sites of the works; in constructing temporary coffer or other dams across the low-lying ground above and below the site of the works; in diverting said creek, subsoil, and surface water, from time to time, as the progress of the contract may require; in providing and constructing adequate and secure fluming, pumping apparatus, &c., for conducting undisturbedly all freshets, and the usual quantity of water flowing in the existing creek, across the site of the works on or near lines of lowest ground; in keeping all trenches and excavations constantly unwatered, and in preventing any injury to the same by floods or any other cause.

35. Diversion of sewage of existing sewers during the construction of the works.—During the construction of the works in general, and of all points of intersection of existing and new sewers, and until completion of all works connected therewith, the contractor to provide all materials and labour and everything that may be necessary, and execute all the works of every description required to prevent (and be solely responsible for) all damage and injury which may occur to private property or to the existing or new works by floods, flooding with sewage, choking and bursting of sewers in consequence of insufficient and inadequate pumping apparatus, tanks, dams, fluming, &c., or any other cause, and erect and construct suitable tanks, pumps, watertight temporary dams across existing sewers above and below points of intersection, and watertight adequate and secure fluming for the purpose of conveying constantly the whole of the sewage which may flow in sewers at any time across said points of intersection, at his sole cost, to the entire satisfaction of the Engineer-in-Chief.

36. The contractor to adopt every precaution and provide all materials, piling, planking, shoring, labour, &c., and carefully execute, erect, and construct, at his own cost, any timbering and shoring wherever required and directed; and also watertight temporary coffer or other dams at junctions of creeks across outlet end of sewer, &c., or to prevent effectually the water from other creeks and from Shea's Creek at low or high water level from entering the site of the works, or such portions of same that may be operated upon at the time, during the term of the contract or as shall be directed, as the contractor shall be held solely responsible for all damage and injury which may occur to private property, to existing or new works, by floods, in consequence of insufficient and inadequate piling, timbering, pumping apparatus, dams, sluices, fluming, or any other cause.

7. Excavation.

37. The excavations for sewers, manholes, junctions, curves, &c., to be executed to the depths, widths, and gradients shown on longitudinal and cross sections, and according to the nature and solidity of the ground.

38. All trenches excavated in rock to be taken out to the exact cross-sections of the concrete work, as shown on drawings, while in compact, loamy, clayey, or other material of sufficient solidity; all trenches to be excavated at bottom level transversely, and 6 inches wider at each side than the exact width required for the concrete, and the sides from bottom of trench to surface of ground to be excavated with a batter of one in eight, unless otherwise directed.

39. In less compact or soft ground the trenches for foundations of sewers, manholes, &c., to be excavated to such depths and widths as shall be directed and determined during the progress of the works. The excavation for foundations of sewers, manholes, &c., may therefore vary in depths and widths from those shown on drawings, but the exact cross-sections of all excavations will be determined by the engineer as the works proceed. All excavations to be taken out to the widths and depths herein specified, clear of any shoring and timbering wherever such may be required.

If the 13 or 27 chains of the outlet end of proposed storm-water sewer (as provided in clause 3) should not be excised from present contract, then pending the completion of proposed ship-canal to its junction with proposed storm-water sewer, an open channel, when ordered, to be excavated to such gradients, depths, and cross-sections, from the junction of the two channels to the present heap of said ship-canal, a distance of about 32 chains, as shown on drawing No. 1, and as shall be determined at the time.

40. The excavation in "solid rock" for pipe-trenches shall have vertical sides, and shall be of the following sizes, viz. :—

|   |                   |
|---|-------------------|
| For 24-in. diameter stoneware pipe-sewers ..... | 3 ft. 9 in. wide. |
| 21-in. do do do .....                           | 3 ft. 4 in. do    |
| 18-in. do do do .....                           | 3 ft. 0 in. do    |
| 15-in. do do do .....                           | 2 ft. 6 in. do    |
| 12-in. do do do .....                           | 2 ft. 0 in. do    |
| 9-in. do do do .....                            | 2 ft. 0 in. do    |

41. When timbering is not required in excavation in all other ground for pipe-trenches, the trenches shall be of the same widths as those in "solid rock." Where timbering is required, the excavation for pipe-trenches 8 feet deep and under shall have vertical sides, and shall be of the following sizes to the outside of the polling-boards, viz. :—

|   |                   |
|---|-------------------|
| 24-in. diameter stoneware pipe-sewers ..... | 4 ft. 0 in. wide. |
| 21-in. do do do .....                       | 3 ft. 7 in. do    |
| 18-in. do do do .....                       | 3 ft. 3 in. do    |
| 15-in. do do do .....                       | 2 ft. 9 in. do    |
| 12-in. do do do .....                       | 2 ft. 3 in. do    |
| 9-in. do do do .....                        | 2 ft. 3 in. do    |

42. Where timbering is required, the excavation for pipe-trenches about 8 feet deep shall have vertical sides, and shall be the widths given in clause 41 for the lower 8 feet, and for any depth over and above 8 feet the trenches shall be of the following sizes to the outside of the 1½-inch polling-boards, unless otherwise ordered in writing, viz. :—

|   |                   |
|---|-------------------|
| 24-in. diameter stoneware pipe-sewers ..... | 4 ft. 9 in. wide. |
| 21-in. do do do .....                       | 4 ft. 4 in. do    |
| 18-in. do do do .....                       | 4 ft. 0 in. do    |
| 15-in. do do do .....                       | 3 ft. 6 in. do    |
| 12-in. do do do .....                       | 3 ft. 0 in. do    |
| 9-in. do do do .....                        | 3 ft. 0 in. do    |

43. Shoring, timbering, and temporary bridges.—During the excavation for sewers, branch sewers, and pipe-sewers, in open cuttings, for junctions, points of intersection, flushing chambers, pipe-trenches, curves, manholes, crossing over or underneath existing road bridges, existing gas, water, and sewer pipes, and oval or circular brick sewers, &c., the contractor to adopt every precaution, as specified in clause 36, and provide all materials, as planking, strutting, shoring, timbering, &c., and labour, and carefully execute and construct, at his own cost, wherever considered necessary by the engineer, and to his entire satisfaction, temporary bridges underneath Mitchell Road and other lines of streets or footpaths, so as to ensure during the period of the contract the undisturbed traffic along said streets, &c.; and execute approved strong and secure shoring and strutting and underpinning where the sewer passes under existing pipes and brick sewers, and in sandy or loose soil close timbering, or any other work that may be required to prevent any buildings over and adjacent to the line of sewer, and all other superstructures, road-surfaces, earth, rock, or other materials at top and sides of excavations from settling, cracking, being shaken, slipping, or falling in.

As the works proceed, all shoring, timbering, temporary bridges, &c., shall be withdrawn except in cases where, in the opinion of the engineer, the withdrawing of the same is impracticable, or would endanger the safety of the works and buildings, existing pipes, sewers, &c., streets, and other surfaces, over and adjacent to same, when the contractor must obtain an order, signed by the Engineer-in-Chief, to the effect that shoring, timbering, &c., may be covered up, with a statement of the quantities, which shall be measured before being covered up, and paid for at schedule rates.

44. Pipe-sewers.—Transverse and other checks to be excavated to receive pipe sockets and junctions, and for the purpose of making joints. No portion of pipe-trench to be opened up anywhere until a sufficient number of pipes are on the ground ready for laying, and no greater length of the trench to be opened up at any time, at any place, than into which pipes can be laid and jointed during two working days.

45. If the contractor has exceeded the sectional area of excavation as shown, he shall remove such extra material and make good and fill in same at sides of trench with good material, and at bottom with sand filling or concrete, as may be directed, at his sole cost.

46. The contractor will be paid only for the actual excavation done, not exceeding that due to the widths, batter, and dimensions, described in clauses 33 to 42. Any increase in width or batter which the contractor may think fit to take out for his own convenience, or which he may be compelled to take out by force of circumstances, will not be measured, but shall be covered by schedule prices. If, however, under the written authority of the engineer, any portion of the excavation has been deepened or widened out on account of bad foundation or for other purposes, the extra excavation so ordered will be paid for at schedule rates.

47. Disposal of soil.—Any sludge, filth, or other objectionable matter that may be met with in the excavations, shall not be used for refilling, but shall be kept separate from the approved soil, loaded into covered carts during the same day on which it is excavated, and disposed of as directed—to be paid for as specified under refilling, clauses 60 and 61.

48. No concrete-work or pipe-laying shall be commenced until the portion of excavation to be operated upon has been cleaned and levelled, and until the engineer or superintending officer has examined and approved of same; and no work shall be covered up until it has been examined and approved, and its covering up has been authorised by the engineer or superintending officer.

49. Sumps.—Any sumps which the contractor may think fit to sink on line of sewer for his own convenience during the construction of these works are to be filled in with concrete, as specified, and the cost of sinking, timbering, unwatering, and filling in concrete and removing the materials, &c., to be entirely borne by the contractor.

50. Removal of road metal, pitching, rubble masonry, timber-decking, &c.—Prior to commencing any excavation for a manhole, junctions, concrete or pipe sewers, road or street intersection, &c., in open cutting (in accordance with the various stipulations and conditions contained in this specification and in clauses 6 and 11 of the conditions of contract), the sites for each work to be prepared by the removal of all road-metal, ballast pitching, asphalted, existing stone abutments, of bridges, timber-decking, &c., where such occurs, as shall be directed. The materials so removed in the first instance to be laid and stacked aside, as the engineer may direct, in different spoil-banks; and as the works proceed, the said materials, if approved of, to be used in reinstating the metalled, pitched, and paved road-surfaces, as the case may be, and those not approved of to be carted away to such places as shall be ordered, the cost of such work to be included in the price for one cubic yard of excavation.

51. All sods, road-metal, pitching, ballast, &c., removed and damaged, injured, or otherwise not approved of as fit for relaying, placing, setting, and fixing in the reformation and reinstatement of the various road and other surfaces, to be replaced by contractor with new, sound, and approved materials of their respective kinds, and therewith to reinstate and maintain during continuance of contract, the various road and other surfaces, at his sole cost, as provided in clause 9, in a sound and satisfactory manner, in accordance with clause 11 of the general conditions of contract, and to the entire satisfaction of the municipal authorities and of the Engineer-in-Chief.

52. It is to be distinctly understood that when excavating for the foundations of the works and open channels where ordered, the materials excavated and raised to the surface of the street, or other ground, are to be at once removed from off the same; and when building materials, &c., are to be conveyed to the works, that the same, on arrival at open cutting, must be at once conveyed to the works in the same, as no allowance can be given to contractor to disturb or impede the usual traffic in the streets, or the usual occupation of the ground by the owner or the public beyond being in possession for the time of a strip of land of the exact width required for the works, as described in clause 6, except in all cases where the contractor has obtained the necessary permission to occupy larger areas, in strict accordance with the provisions contained in clauses 6 and 11 of the conditions of contract.

53. The different materials as sludge, filth, sods, road-metal, ballast, mud, sand, loam, clay, shale, and ironstone, masonry, timber-decking, &c., met with in all excavations for the construction of these works, shall in the first instance be put aside beyond actual site of the works in separate spoil-banks; they are to be measured and paid for under one item as "general excavation," and then to be used in filling in round concrete and over same, and filling into abandoned portions of existing open channels, as hereinafter specified in clauses 55 to 62, and as shall be directed.

54. The price of one cubic yard of excavation for all sewers, manholes, junctions, curves, open channels, &c., shall include the cost of all labour, tools, implements, plant of every description, timbering, shoring temporary bridges underneath streets, lanes, roads, &c., diverting surface water, unwatering, putting all excavations in the first instance to temporary spoil-banks, reinstating all fences, walls, walks, streets, roads, metalling, grassed, paved, or asphalted surfaces, as they were before the commencement of the works, and completing these works in strict accordance with plans and specifications.

#### 8. Refilling, Road Restoring, &c.

55. Refilling.—Unless otherwise directed, sand, clay, loam, pipeclay, and soft rock of approved quality only shall be used in refilling the spaces between the sides of pipes, sewers, &c., and sides of excavation, and over pipes, sewers, &c. The refilling to be done in level layers, spread 6 inches thick, each layer to be carefully and separately rammed as hereinbefore specified. The lower layers up to level of top of pipes to be carefully packed and rammed solidly under and at sides of pipes and socket-joints with spades or other narrow tools. The filling to be done, as above described, to such a distance below the level of the street, road, path, &c., as the case may be, to admit of the ballasting, metal, or other covering being replaced. Only iron-shod rammers of not less than 10 lb. weight, of approved pattern, to be used, and one man to be employed in ramming to each man to be employed in filling. Filling into embankments and into abandoned portions of existing open channels to be done as above described, except that the layers shall be 9 inches thick, and all slopes of embankments to be dressed to such inclines as shall be directed.

56. Road restoring.—After the filling-in of sewer-trenches has been consolidated and approved, as specified, the surfaces of roads, streets, paths, &c., to be at once formed or restored, as the case may be, in the manner hereinafter described, viz., in the case of roads and streets which are ballasted and metalled, 9 inches of ballast shall be laid thereon, and after this has been blinded with selected and approved material, the metal put aside, as specified in clause 54, shall be evenly spread and rammed until approved; in the case of roads or streets which are ballasted only, 9 inches of ballast shall be laid thereon, and blinded with selected and approved material; and in the case of other coverings the surfaces to be restored to the same condition as they were before the commencement of the work. Any additional ballast which may be required over and above that found on the site of the excavation, and referred to in clause 50, to be supplied by the contractor, and the cost of same to be included in schedule items for filling.

57. Cleaning streets.—Immediately the pipes are laid, or concrete and other work in connection with manholes, lampholes, &c., are executed, and the ground filled in over any length of sewer, it is to be distinctly understood that all surplus material is to be carted away, the road cleaned until approved, and the road and other surfaces to be made good, flush with surrounding surfaces of roads, paths, &c., to the satisfaction of the municipal authorities and the engineer, in accordance with the specification; and if the contractor fails to do this the engineer shall be at liberty, without further notice, to get the roads cleaned, and the road and other surfaces made good at contractor's cost.

58. Maintenance of streets.—The contractor shall maintain the surface of the roads, streets, &c., after the trenches have been filled in, where the streets, roads, &c., have been broken up or injured during the progress of the work, during the period of the contract time, and afterwards during the period of maintenance, and shall from time to time make good any sinkings in the surface, and shall provide any additional metal, ballast, or other material that may be necessary during these periods, in accordance with clause 9.

59. If required by the engineer, the contractor shall, at the termination of the period of maintenance, procure certificates from the municipal authorities concerned, that the roads, &c., in their respective districts are in a satisfactory condition.

60. The price of one cubic yard of filling round all concrete and brickwork of sewers, curves, junctions, manholes, into old creek channels, embankments, &c., from all excavations, and any other sources outside the limit of the contract, shall include the cost of all labour, tools, implements, and plant of every description, carriage from temporary spoil-banks, or getting additional materials from other places outside the contract, excavating, filling-in, ramming, watering, and completing all filling-in in strict accordance with plans and specifications. It shall also include the removal and disposal of all rubbish, sludge, and other objectionable matter, as well as any excess of material beyond that required for refilling; these materials to be immediately removed from site of works and deposited in such places as shall be approved.

61. All refilling to be measured the net dimensions of excavation, less the actual net displacement of the permanent works.

62. Where it is found necessary to carry the excavation deeper than the underside of concrete foundations, in order to obtain a compact solid bottom, the portion so excavated to be filled in to the underside of concrete foundation with good quarry-filling (which shall be provided by the contractor), in level layers 6 inches thick, rammed and watered until approved. The price per cubic yard of such filling in to be one cubic yard of "filling-in" as described in clauses 60 and 61.

*Turfing.*

63. On completion of all refilling and filling at sides of concrete-work, and pitching, into abandoned open channels, and where ordered, all top surfaces and slopes to be protected by sodding. Prior to sods being laid, all surfaces to be levelled off, trimmed, and dressed to such level or inclined planes or slopes as shall be directed. The sods to be the best obtainable within a radius of 5 miles, of approved quality, not less than 3 inches in thickness and 10 inches square at top and bottom, full cut, with square arrises, to be laid in approved bond on their own flat beds, close-jointed, over all top surfaces of filling, to be beaten down as the work proceeds with proper tools, as shall be directed, and when finished to present throughout perfectly smooth and plain surfaces. If the season requires it, the turfing to be properly and regularly watered to ensure the grass taking fresh root. The levelling and trimming of the ground and the turfing to be carried out simultaneously, and no greater area to be levelled and trimmed at any time than can be covered with turfing during two working-days.

*IX.—Timber, Stone, Cement, Sand, Appliances, Plant, &c., to be on the ground ready when required.*

64. No excavations to be commenced on any portion of the contract until, in the opinion of the engineer, sufficient quantities of piles, sheet-piles, shoring, staging, scaffolding, stone, bricks, cement, sand, or other materials are on the ground, together with the necessary appliances and plant, to ensure the uninterrupted progress and continuance of the works, after they once have been commenced, at any locality, without any delay or stoppage. Delays and stoppages in the progress of the works arising from disputes as to quality of materials, and from insufficient supply of any materials, plant, &c., and any damage or injury caused to the works in consequence of such stoppage and delay, shall be entirely and solely at the risk and cost of the contractor.

*X.—Subducts.*

65. Where ordered, subducts to be constructed in hard-wood boxes, along lines of open trenches, 24 inches below invert of sewer, or as shall be directed at the time. The said boxes to be laid straight and true to levels decided upon, and 6-inch pipes to be laid therein, upon and surrounded by sandstone chippings and quarry refuse. Dry stone packing to be put over pipes, as specified in clause 18.

*XI.—Storm-water Channel, &c.*

66. Manholes and flushing-chambers to be built with sandstone concrete, to the forms and dimensions shown on Drawing No. 2, as may be ordered at the time.

67. Junctions and points of intersection, where ordered, to be formed in sides of manhole-chambers and sewers, &c., and worked into sewer-channel with such curves, shapes, forms, centre piers, arches, &c., as shown on drawings. Step-irons of  $\frac{3}{4}$ -inch round iron to be built into the concrete 15 inches apart, vertically, for giving excess to manholes. Grooves to be formed for flushing-boards and flushing-valves, to be built in where directed.

68. A cast-iron ventilating-grating to be placed over each manhole-flush with the surface of the street, and surrounded to a width of 9 inches with sandstone pitchers, bedded on paving-sand, set with full joints, and well rammed, cast-iron gratings to be placed over all manholes on line of sewer in open ground, flush with the formed surface of same, to be surrounded with pitchers as before.

69. After the cross-section and depth of trench for each respective length of sewer, according to the more or less solid nature of the ground, has been determined, excavated, cleaned, and approved, the sewers, together with the manholes, flushing-chambers, junctions, curves, &c., to be built therein with sandstone concrete in the manner described in clauses 78 to 95.

70. Where the ground is found to be very bad, the contractor shall, upon being ordered in writing to do so, construct timber platforms. The whole of the timber used in this work to be coated with two coats of the best kerosene tar. Transverse ground sleepers 12 in. x 12 in., spaced 6 feet from centre to centre, to be laid to exact depths and levels, and longitudinal sleepers 10 in. x 10 in. to be laid on top of same with butt joints, with 10 in. x 4 in. fish-plates 3 feet long underneath each joint, and bolted to the sleepers with two  $\frac{3}{8}$ -inch drift-bolts. The planking to consist of planks 9 in. x 3 in. sawn hardwood the width of the sewer, or longer if required, and spiked to sleepers with 7-inch spikes, one to each bearing; the spikes to be drifted down and cleaned off. All timber split, from whatever cause, to be replaced with sound timber. Before the plank-floor is laid down the spaces between ground and longitudinal sleepers to be filled in with sand, well rammed and watered, as shall be directed.

71. Guide-piles, walings, and sheet pilings at outlet end of channel, and where ordered.—Hardwood piles, 12-inch diameter at small end, to be provided, and to be driven perfectly plumb to a depth as shown on drawings, and as shall be directed. Any pile out of line, or split during driving, to be drawn and another sound one driven in its place. Piles to be fitted with wrought-iron, steel-pointed shoes, weighing 28 lb. each, of approved pattern, secured to piles with  $\frac{1}{2}$ -inch round iron spikes. The piles to be driven with a ram weighing 20 cwt., with fall when in position of not less than 5 feet, the fall to be increased as the pile is driven, as the case may require, and as may be directed. The side surfaces of piles to be adzed to a flat face for sheet piling to butt against, and the top shouldered to receive walings. Double walings, each 10 in. x 6 in., and central walings 10 in. x 10 in., to be provided and secured to piles by 1-inch galvanised bolts. Sheet piling, 3 in. by 9 in., to be provided, and to be placed between walings and driven down to the depths shown on drawings, and as shall be directed; to be driven close and wedged up. All piling badly driven to be drawn and fresh piling substituted. The guide-piles to be rung with 3 in. x  $\frac{3}{4}$  in. rings, and sheet piling with  $1\frac{1}{2}$  in. x  $\frac{1}{2}$  in. hoops. The plank floor of 9 in. by 3 in. planks over heads of piles to be provided and constructed as specified in clause 70.

As the contractor must provide all coffer-damming at his own cost, the above-described work may form part and be in conjunction with any timber-work for same, but only such piling and timbering described in clauses 47, 70, and 71, as ordered, will be paid for under schedule rate.

*Pipe-sewers.*

73. Foundation.—In clay or similar soil the pipes to rest direct and solid upon the soil. In rock, they are to be laid on a 1-inch bed of poor mortar; cost of same to be included in items for pipe-laying. In loose sand and other soil liable to be scoured out or easily shifted, they shall, if directed by the engineer, be laid on and surrounded by sandstone concrete, as ordered.

74. Laying.—In every case they shall be laid in such a manner that their barrels shall bear firmly and evenly on their bedding material, the sockets being entirely free from pressure in the joint-hole, and the spigots concentric with the sockets, and to be jointed, viz. :—

75. The 6-inch pipes with tarred gasket,  $\frac{1}{2}$  inch deep after setting, and special cement mortar  $1\frac{1}{2}$  inch deep within socket of pipe; the 9-inch pipes with tarred gasket,  $\frac{1}{2}$  inch deep after setting, and special cement mortar  $1\frac{1}{2}$  inch deep within socket of pipe; the 10-inch pipes with tarred gasket,  $\frac{1}{2}$  inch deep after setting, and special cement mortar  $1\frac{1}{2}$  inch deep within socket of pipe; the 12-inch pipes with tarred gasket,  $\frac{3}{8}$  inch deep after setting, and special cement mortar  $1\frac{3}{8}$  inch deep within socket of pipe; the 15-inch pipes with tarred gasket,  $\frac{3}{4}$  inch deep after setting, and special cement mortar  $1\frac{1}{2}$  inch deep within socket of pipe; the 16-inch pipes with tarred gasket,  $\frac{3}{4}$  inch deep after setting, and special cement mortar  $1\frac{1}{2}$  inch deep within socket of pipe; the 18-inch pipes with tarred gasket,  $\frac{3}{4}$  inch deep after setting, and special cement mortar  $1\frac{3}{4}$  inch deep within socket of pipe; the 24-inch pipes with tarred gasket,  $\frac{3}{4}$  inch deep after setting, and special cement mortar  $1\frac{3}{4}$  inch deep within the socket of the pipe.

76. After the tarred gasket has been placed in position and set tight round the pipe, and after the joint above has been cleaned and wetted, stiff special cement mortar to be packed in solidly, splayed off outside and finished with a carefully struck and cut joint, after which the inner joint between two pipes to be likewise carefully filled with special cement mortar all round, neatly wiped off as a finish. Each pipe length when thus finished to be carefully cleaned out before another pipe length is added.

77. Junction-pipes of any desired size are to be laid into the line of pipe-sewers wherever required by the Engineer. The socket ends of all junction-pipes, junction-blocks, junction-holes, and dead-ends are to be protected against the ingress of foreign substances, and made easily accessible for effecting future connections, by being closed with earthenware discs having a temporary watertight joint all round.

*Concrete-work.*



*Concrete-work.*

78. The concrete to be used in these works to be sandstone concrete of the quality specified in clause 27.
79. The contractor to find, provide, and make, at his own cost, all concrete-boxes, centres, staging, shoring, planking, &c., of the exact forms, shapes, curves, &c., required in a proper, secure, and substantial manner, due allowance being made for  $\frac{5}{8}$  inch thick cement facing over all internal exposed surfaces of concrete-work, and great care being taken that all centering and concrete-boxes can easily be withdrawn, except where otherwise directed. The designs for centering, concrete-boxes, &c., are to be approved by and to the entire satisfaction of the engineer. After completion of any portion of the concrete or brickwork, the concrete-boxes and the centering, as the case may be, shall not be removed until the Engineer or his superintending officer, has given written permission to that effect.
80. The concrete to be prepared on a clean timber platform of the necessary size. The stone to be well washed when put on the platform and levelled on top; the sand to be placed on top of stone, and cement on top of sand; the whole is then to be carefully turned over three times while dry, and then mixed with clean fresh water applied from a rose, as shall be directed; to be thoroughly incorporated before being used, and to be used fresh.
81. If the concrete is made by machinery, all materials to be prepared as previously described; then to be mixed dry, and afterwards with fresh clean water, as may be directed, and as shall be approved of; to be used fresh.
82. The concrete, after it has been approved of, to be conveyed to the work as may be directed, and as shall be approved of, and tipped into same and upon the surface of each layer from a height not exceeding 18 inches. Commencing at each part of the work at lowest level of excavation, the concrete to be brought up in horizontal and even layers, and on lines of sewer, branch and pipe-sewers, manholes, junctions, ventilating-chambers, &c., unless where otherwise directed, in even layers, parallel with specified longitudinal gradients of works. Each layer when spread to be 9 inches thick throughout before ramming, and, after spreading, to be quickly and evenly rammed all over until approved of, and then allowed time to set before the succeeding layer is put on.
83. After the contract has been carried up to the level of springing, all concrete arches to be commenced at both walls or abutments simultaneously, and carried on towards centre line in radiating parallel strips, spread 9 inches thick, of the whole width of arch, or in lengths as specified in clause 95 and as shall be directed at the time, and rammed as before described, and, where the arch is thicker than 9 inches, the lower layer to be completed throughout, and then allowed time to set and harden before the succeeding layer is put on.
84. After completion of the brick closing arch, all concrete work above springing of same, at sides of arch, in man-hole-chambers, shafts, &c., to be carried up in the same manner as specified in clause 82, and of exact dimensions, curves, and thicknesses, &c., as shown on drawings.
85. No portion of the concrete-work described in the previous clauses (unless otherwise directed in writing) to be covered up with earth or brickwork until it has been examined and approved of by the engineer. Any leakage that may appear in each layer to be carefully attended to, and be made good and repaired at the time, as shall be approved, before each succeeding layer is put on.
86. All end faces of layers of concrete to be stepped back at each respective length of sewer or other work, as shall be directed; to be carefully washed clean with fresh water, and then to be grouted prior to each layer of the adjoining length being commenced and joined on to the same.
87. After the lower layer has set to the satisfaction of the Engineer its top service to be carefully washed until approved, and then to be grouted all over prior to each succeeding layer of concrete being put on.
88. In the event of any stoppage occurring to the work, from whatever cause, or in anticipation of rainfall, the contractor, before temporarily stopping work, shall finish it off at whatever level the work may be raised at the time, by thoroughly grouting the whole of the surface with cement-grout. The contractor also to provide and have always on hand approved tarpaulins for the purpose of covering therewith, where and whenever directed by the engineer to do so, all fresh concrete-work and brickwork, when ordered, so as to protect the same, during all stoppages in the day-time and at night, from sun and rain, and during hot or dry weather to keep said tarpaulins watered to prevent the concrete-work from cracking and setting too quickly on the outside.
89. In all cases where a layer at mid-day or at evening is left incomplete, the said layer shall not be continued after any stoppage until the surface of the lower and the end of the upper layer have been washed clean and then grouted with cement grout.
90. At the sites of all flushing-valve or stop-board frames, cast-iron covers over manholes, ventilating-chambers, &c., after the concrete has been built to the exact height and gradient (leaving sufficient space for jointing), the whole of the cast-iron work, after having been washed clean with fresh water, is to be truly laid and jointed or set perfectly plumb or otherwise, as the case may be, and as shall be directed, in the exact positions, lines, and gradients, on fillets of mortar; and as the concrete rises against and around the castings, leaving a space of not less than  $\frac{1}{2}$  inch all round between the concrete and iron, this space round the invert, or underneath bottom of plates, as the case may be, to be filled in with special grout, or mortar, as shall be directed at the time, whilst above the springing line the outer surface of the castings to be grouted with special grout, and then to be covered with a coat of special mortar  $\frac{1}{2}$  inch thick before the concrete is built on to and around said pipes, castings, and frames.
91. The junction of the two creeks between 39.12 chains and 39.77 chains to be constructed with such curves, shapes, forms, flat arches between wrought-iron rolled girders, &c., as shown on drawings. On completion of junction to exact level of underside of transverse iron girders, the latter to be laid transversely over side walls of junction, bedded in and upon special cement mortar,  $\frac{1}{2}$  inch thick, truly parallel to each other, and spaced 4 feet from centre to centre, after which the cement filling alongside walls between and over ends of girders to be completed. The arches of 4 feet span, with a rise of 5 inches in centre, between the girders, to be commenced from north end, and to advance to the south end of junction (all girders being carefully stiffened and held in position by props as shall be directed) with not less than 11 centres of the exact width of junction between side walls. The arches to be built as specified in clause 83, and on completion to form a level concrete decking 3 inches above level of top of girders.
- The intersecting point of proposed 18-inch diameter sewer, passing transversely through new storm-water channel near Mitchell Road, to be constructed and formed by said storm-water channel being gradually widened from its proper width of 10 ft. 6 in. above point of intersection to 15 ft. 6 in., and again drawn in to its proper width of 10 ft. 6 in. below said point of intersection (on a total length of 24 feet) with a pier 18 inches thick in centre, as shown on drawing, care being taken that the same cross-section area is maintained throughout the length of the intersecting chamber; 2 ft. x 2 ft. openings to be left at present in side-walls and centre pier of sewer for insertion of said 18-inch diameter pipe-sewer, said openings to be temporarily closed with brickwork in cement 9 inches thick.
92. All anchor-bolts in connection with cast-iron frames to be placed in the exact positions required, to be washed clean, wetted, bedded upon, and surrounded with special mortar, in each case before the concrete is built round same.
93. All stoneware pipes, where they are shown to be or ordered to be surrounded with concrete, to be clean washed with fresh water, to be truly laid and jointed in the exact lines and gradients on fillets of mortar, and to be grouted all round with special grout as the concrete is being built all round same.
94. On completion of concrete-work, and after the boxes and centering have been removed, the outer faces shall present compact, solid, even, plain surfaces. All faulty portions, cavities, holes, or other defects shall be at once repaired by the contractor, at his own cost, with concrete or mortar, as the case may require, to the satisfaction of the engineer.
95. The concrete of sewers in open trench to be commenced in accordance with clauses 2 and 116 in the different lengths of open trenches, and to be carried up in each and from each end of same simultaneously, in not less than three continuous lengths of 40 feet each (unless otherwise directed),—that is to say, when the arching-in of the first 40 feet commences the next length of 40 feet must be completed up to the springing of arch, and the third 40 feet length must be in progress, and the latter so timed that the work is raised up to springing of arch by the time the closing in of the adjoining length commences.

*Brickwork.*

96. The brickwork required in sewers, &c., to consist of the materials and mortar described under clauses 14, 15, 20, 21, and 22. All circular work to be built of radiating bricks, unless otherwise directed. All bricks to be thoroughly soaked in clean fresh water for not less than five minutes immediately before being used. All work to be built with whole bricks, and all walls in English bond, with  $\frac{1}{4}$ -in. joints, in alternate courses of headers and stretchers, each brick to break joint with the one above and underneath, and to be set full and rubbed in cement mortar. Every course to be carefully and thoroughly grouted, and well wetted before the succeeding course is put on. All work, wherever directed, to be finished on all outside and inside faces with a neatly-struck joint. The brickwork of sewers, &c., to be of the thickness, dimensions, curves,



curves, and gradient shown on longitudinal and cross sections, and as shall be determined and directed from time to time by the engineer as each portion of excavation becomes ready for concrete or brick lining. Wherever brick lining for sewer is ordered it shall be built in radiating courses in  $4\frac{1}{2}$ -in. rings, each brick to be set full and rubbed in cement mortar, with joints not exceeding  $\frac{1}{4}$  in. in thickness, in approved bond, the bricks of each course to break joint over the centre of those of the adjoining course. On completion of each ring of brickwork its whole surface to be carefully and thoroughly grouted, and then covered with a coat of cement mortar, collar-joint  $\frac{1}{2}$  in. thick. Before commencing each succeeding ring the surface underneath to be well wetted and grouted to ensure the thorough bonding of the joints. At completing any length of brick lining, the courses at end of same to be stepped back as shall be directed, and the end face of each ring or course to be well wetted and then grouted prior to each ring of the succeeding length being commenced.

97. The brickwork of sewer to be carried on in conformity with clause 95, and in such a manner that when the arching-in of one length of 40 feet commence the lining of invert of the next 40 feet in length must commence at the same time, and as the arching-in of the one length is completed the adjoining length must be completed up to the springing of arch.

98. Wherever concrete is to be built on to and against brickwork, or brickwork on to and against concrete, the latter in each case to be well wetted and grouted, and then to be covered with a coat of cement mortar, collar joint  $\frac{1}{2}$  in. thick, before the concrete or brickwork is built against it.

99. Prior to commencing any concrete or brickwork which has to be built on to and against rock faces, all shaken and loose rock to be removed, all rock surfaces to be well cleaned, washed, and wetted, and all beds, open joints, and spaces between concrete or brickwork and rock faces to be carefully filled in with cement mortar, and flushed and grouted every course as the brickwork proceeds; and the cost of thus preparing rock faces, washing, grouting, flushing, &c., to be included in, and covered by, the schedule price per cube yard for the concrete and brickwork herein referred to.

#### *Pyrmont Sandstone.*

100. Pyrmont sandstone ashlar of the quality specified in clause 17 to be provided where ordered in any situation in the construction of these works, to be worked, pierced, dressed, picked to the exact sizes, dimensions, forms, and shapes as shown on drawings or as may be directed, to be set full upon and in cement mortar, and to be finished, when directed, with a neatly cut and struck joint.

#### *Bluestone Ashlar.*

101. Bluestone ashlar, of the quality specified in clause 32, to be provided in blocks or otherwise when ordered, in any situation in the construction of these works, to be worked, pierced, grooved, picked, axed, and dressed to the exact sizes, dimensions, forms, and shapes, as shall be shown on detail drawings, or as may be directed; to be washed clean and well wetted before setting, and to be set in the exact positions required, truly level, on fillets of mortar, under the four corners of each stone, or under and between outer edges of joints as may be directed at the time, after which all joints between stones and between stones and concrete to be filled in with grout. All joints to be  $\frac{3}{8}$  inch wide, to be carefully raked out  $\frac{3}{4}$  inch deep, and filled in solid with special mortar, neatly pointed, finished flush with exposed faces of stones.

#### *Ironwork.*

102. Rolled girders, sheared, or cut, as shown on drawing No. 5, to be supplied, delivered, and fixed, as specified in clause 91, and to be paid for at per cwt. under schedule item No. 18. The contractor to provide means of weighing same in the presence of the inspecting officer. Should the girders be below the specified weights, payments will be made on actual weights, but any weight above that specified will not be paid for.

The following will be required :—

| Depth of Girder. | Width of Flange. | Thickness of Web.   | Length of Girder.                | Weight in lb. per foot run. | Number required. |
|------------------|------------------|---------------------|----------------------------------|-----------------------------|------------------|
| 14 inches.       | 6 inches.        | $\frac{3}{4}$ inch. | Varying from 12 feet to 18 feet. | 60                          | 10               |

103. All girders that are bent or twisted shall be heated and straightened.

104. The wrought-iron in girders must be free from scales, blisters, laminations, and all other defects, of approved manufacture, and equal in quality to the best Staffordshire plate. The ten lengths of the girders are respectively as, viz.:—12 feet, 12 feet, 12 ft. 3 in., 12 ft. 9 in., 13 ft. 6 in., 14 ft. 3 in., 15 ft. 3 in., 16 ft. 6 in., and 18 feet.

105. The test for wrought-iron shall be as follows :—A piece of 1 inch sectional area, of such shape and cut from such a bar as may be determined, with a length of at least 7 inches, under tension shall bear a strain of—

|   |
|---|
| 18 tons without elongation exceeding $\frac{1}{8}$ inch ; |
| 21 " " " " " " $\frac{1}{4}$ "                            |
| 23 " " " " " " $\frac{1}{2}$ "                            |

and to elongate  $\frac{3}{4}$  inch with a strain of 24 tons before fracture.

106. The whole of the wrought-iron work to be properly cleaned and then heated, and while hot to be dipped or coated with two coats of hot gas-tar, to be applied with brush.

107. The girders to be solidly bedded in the concrete on a  $\frac{1}{2}$ -inch joint of special mortar, and finished off inside and outside with a neat cut and struck joint.

108. The castings to be provided of the grates and frames, &c., shown on drawing No. 5, to be cast of No. 2 pig-iron or of a proper mixture of No. 1 and No. 3 pig-iron, according to the quality of the iron and the nature of the pattern; said iron to be of the best quality, tough, close-grained, and capable of being chipped and drilled without difficulty, perfectly sound, free from all cold shuts, honeycomb, holes, or other defects; to be cast in dry sand moulds, unless where otherwise directed; and the whole of the castings of the pipes, plates, ventilating and other grates and frames, as soon as they have been cast, to be properly cleaned and then heated, and whilst hot to be dipped or coated in gas-tar.

109. All castings to be true in sectional form, straight longitudinally where shown to be so, or of such shapes, projections, curves, angles, and forms as shown on drawings; and each portion of such castings to be of equal strength and of the specified thickness throughout its respective length. The ventilating grates to be complete with tarred sawn iron-bark wood-bricks fitted into panels of covers, as shown.

110. The external and internal surfaces of all castings to be perfectly clean and smooth, and in strict accordance with sections.

111. The cast-iron work hereinbefore specified to be completed in the most workmanlike manner in strict accordance with the drawings and dimensions figured thereon, and such directions and other details which the engineer may provide during the progress of the works; and all grates, &c., with all wrought-iron work, to be left in perfect working order.

#### *Cement Coating.*

112. The whole of the internal and external surfaces of sewers, manholes, chambers, &c., where such is shown on plans, and where directed, to be protected by a cement coating, to be put on in two thicknesses, consisting of mortar of one part of cement to two parts of clean sharp sand. The coating throughout, when finished, to be  $\frac{3}{8}$  inch in thickness.

113. All surfaces to be well watered before mortar is applied.

#### *Sandstone Pitching.*

114. Contractor to provide and find, where ordered, squared sandstone pitchers 9 inch deep throughout, no stone to be less than 9 inch x 9 inch x 9 inch, but to be larger and longer, if ordered, curved and radiating, as shall be directed; to be worked, fitted, and set in sand, one ring round all manhole covers, with  $\frac{1}{2}$ -inch joints between pitchers and cast-iron frames, as ordered.

*Existing*

*Existing Gas, Water, or Sewer Pipes and Sewers.*

115. During the excavation and construction of these works the contractor is to take every precaution to prevent damage or injury to existing gas, water, or sewer pipes and sewers. Such pipes and sewers on being met with at sides, over, or crossing the excavations of these works, to be carefully and securely protected and supported, as the case may require, by chains, timbering, strutting, and under-pinning, &c., to prevent said pipes or sewers from being shaken, bent, or broken, and the contractor to provide all materials, plant, and labour required for said timbering, strutting, and under-pinning, &c., and maintain the same at his sole cost until, in the opinion of the engineer, the refilling of excavation and the general progress of the works render further precaution unnecessary.

*XII.—General Progress and order of Works.*

116. The contractor, immediately after he gets possession of the ground, shall commence the sewer throughout the length of the contract, unless otherwise directed, and proceed with the earthwork, concrete, and other works connected therewith in the manner described in clause 95. The progress made every working week with excavation, filling in, concrete, pitching, roadwork, &c., required in the construction of the sewer and all other works, shall not be less than 160 feet of sewer complete.

*XIII.—Notice for Inspection.*

117. The contractor will give notice to the engineer of the commencement or completion of the undermentioned work, and formally submit it for inspection before proceeding to place, execute, or cover it up, viz. :—

Excavation of trenches.  
Excavation for foundations.  
Withdrawing of timber in open excavation, &c.  
Laying of foundation.  
Laying of pipes or subducts.  
Placing centering in position.  
Keying of arches.  
Striking of centres.  
Shifting of concrete boxes.  
Filling in round concrete and pipe-sewers and manholes into open trenches, sumps, &c.

*XIV.—Power to use any part of the Work.*

118. The Engineer-in-Chief shall have the power, at his discretion, without vacating this contract to enter upon, by himself or his agents, and make use of any part or parts of the work comprised under this contract, and his doing so shall in nowise be held as a waiver of the responsibility of the contractor in respect to his contract, except in so far as any injury may accrue to such work so entered upon by reason of any proved carelessness of any employé of the Government, in which event the contractor shall be free from liability on account thereof, but not otherwise.

*XV.—Maintenance.*

119. The contractor will be bound to maintain the works for a period of three months after their final completion and use by the Government; and if any part should within that period show signs of weakness or of giving way, or should any defective workmanship or materials be detected, the contractor, when called upon to do so, shall make good same at his own cost, to the satisfaction of the Engineer-in-Chief, before the reserve balance will be paid. It is to be distinctly understood that the Government shall have the full, free, and unrestricted use of the said works, without any interference whatever on the part of the contractor, during the currency of this period of maintenance; and such use of the said works on the part of the Government shall not be held as relieving the contractor of any liabilities or obligations whatever in respect of his contract.

*Conditions of Contract.*

120. The special and general conditions attached to this specification shall be held binding on all matters relating to this contract as far as the Engineer-in-Chief may deem the same applicable.

This is the specification marked "A," referred to in our annexed agreement with Her Majesty the Queen, dated the 16th day of March, A.D. 1891.

Witness,—HAROLD F. NORRIE, J.P.

JOHN CARTER.  
D. G. SNODGRASS.  
GEO. FORREST.

"B."

*1. Interpretation of Terms.*

Whenever the terms, hereafter explained in the present clause, occur in the conditions of contract and in the specification, they shall be held to mean, and shall mean as follows :—

- "Minister" shall mean the Secretary of Works of the Colony of New South Wales for the time being, or any person legally acting for him.
- "Engineer" shall mean the Engineer-in-Chief duly appointed by the Minister to have principal charge of the works.
- "Assistant Engineer" shall mean the person duly appointed by the Engineer-in-Chief to act in his behalf.
- "Superintending Officer" shall mean any person who may from time to time be notified to the contractor by the Engineer-in-Chief as being entrusted with the local superintendence of the works.
- "Overseer" shall mean any person who may from time to time be appointed by the Engineer-in-Chief to supervise the works or any part thereof under the immediate direction of the superintending officer.
- "Contractor" shall mean "Contractors" when two or more persons have tendered or contracted jointly for the work.
- "Special Conditions" shall mean the "Special Conditions" hereto attached and forming part of the contract; such special conditions shall be deemed to be, and shall be, incorporated with the general conditions.
- "Schedule Price" shall mean the rate at which the contractor has offered and agreed to execute the kind of work under consideration.
- "Contract Sum" shall mean the sum total, resulting from the finally certified quantities, ascertained in the manner provided in clause 16, and calculated at the schedule rates or arranged prices.
- "Drawings" shall mean and include any plan, section, general or detail drawing, sketch, or illustration referring to the works and explanatory of, or supplementary to, the specification.
- "Extra Work" shall mean any kind or description of work, not comprised in the "Schedule of Prices," and other than those, the distinct mention of which may have been inadvertently omitted in the specifications or drawings, and for which provision is made in clause 3 of these conditions.
- "Labour."—All cartage and haulage, and work done or to be performed by machinery, shall be included in the term "Labour."
- "Plant" shall mean and include all tools, utensils, stores, sheds, timber, scaffold, centres, moulds, templates, coffer dams, cordage, chains, tackle, boats, punts, rafts, sleepers, rails, waggons, trucks, trollies, engines, water and air pumps, boring and ventilating apparatus, signals, lights, diving bells and dresses, and every other thing necessary for the security, proper execution, completion and specified maintenance of the several works.

2. *Extent of Contract.*

The contractor shall, except in so far as the specification may expressly state to the contrary, provide at his own cost and expense all labour, material, and plant, and everything else necessary for the proper and complete performance of the contract. Supply of labour, materials, and plant.

All works described in, or implied, by the specification, or shown in any of the drawings, or set forth in any lists or tables thereof, or attached thereto, as well as those expressly herein provided for under clauses 3 and 4, are to be made and executed in every detail conformably to the several drawings already prepared, or that may be prepared hereafter for the purpose of this contract, in strict accordance with the provisions of the specification and conditions, both general and special, and to the entire satisfaction of the engineer. Execution of works.

Should any work be not so executed, it shall be at the sole risk of the contractor, and shall be immediately altered and amended at the contractor's cost and expense.

The contractor shall, at his own expense, set out accurately and to the satisfaction of the superintending officer, all the works comprised in this contract, in strict accordance with the drawings and specifications, and shall be solely responsible for their being so set out and executed, and that notwithstanding the superintending officer or overseer may have assisted the contractor in setting out the same. Setting out.

Contractor shall also at his own cost and expense at any time—by day or by night, either on working days or on Sundays or holidays—render all such assistance, and supply all such labour, plant, and lighting, as the engineer or superintending officer may require to check such setting out, or to inspect any portion of the works, which must for that purpose be left clear and free from any obstruction or impediment. During and for the performance of those operations contractor shall be obliged to suspend any or all of his work, if required to do so by the superintending officer, and without having any claim for loss or damage on account of such temporary suspension.

All bench marks, pegs, and signals on the surface, and all alignments and level marks underground, put in by the engineer or superintending officer for the purpose of checking the contractor's work, will be pointed out to the contractor and confided to his care. He shall, at his own expense, take all proper and reasonable precaution and care to preserve and maintain them in their true positions; in the event, however, of their being disturbed or obliterated by accident or from any other cause whatever, they shall be replaced by the engineer or superintending officer at the contractor's expense, and the cost thereof deducted from any moneys, then or thereafter due to the contractor. Protecting and maintaining signals and marks.

If two different contractors execute simultaneously two adjoining sections of the works, they shall be held jointly and severally responsible for effecting a proper junction of the sections. Junction of different contracts.

During the whole time of construction and during the "period of maintenance," referred to in clauses 10 and 18 hereof, and more particularly described in clause 3 of the special conditions, contractor shall keep and maintain in good and sufficient repair all the works, executed or in course of execution, and make good all injury or loss, which may happen or occur to them, or to any materials, or plant, or anything else in connection with the works under this contract. Maintenance.

4. *Specification and Drawings.*

The specification and the drawings (if any), referred to in the specification, shall be taken to explain each other; and anything contained in the specification or in any of the drawings shall be equally binding on contractor, as if it were contained in all. Specification and drawings to explain each other.

Any dimensions, written or figured on the drawings, shall usually be taken in preference to measurements by scale; but in cases of doubt in this respect, or in case of any discrepancy between the drawings, specifications, and conditions, or any ambiguity or defective description in them, such doubt, discrepancy, ambiguity, or defective description shall not invalidate the contract, but shall be rectified by the engineer if he deem it requisite, and the contractor shall have no claim for compensation for damages on account of such discrepancy, ambiguity, or defective description. Written dimensions to be preferred to scaling.

If neither specification nor drawings contain any mention of minor parts of works, which are reasonably and obviously necessary for the satisfactory completion of the works, such parts are to be provided, made, and executed by the contractor, without any extra charge, as if they were specially mentioned, and shall be deemed to be, and hereby are, included in the several schedule prices. Omission of minor parts.

It is hereby expressly understood, that the contractor is bound to completely and thoroughly inform himself of every circumstance connected with, or relating to, the work, and of the correctness or otherwise of any information contained in, or supplied by the drawings or specification, as he shall have no claim on account of any errors, omissions, or inaccuracies that may be found in those documents after the contract shall have been signed, and since he has to provide in his tender for every contingency that may arise. Errors of information at contractor's risk.

A copy of the conditions, specifications, and drawings will be furnished to contractors free of charge, but he must himself compare the same with the original, as no claim will be allowed for any errors therein. Supply of drawings and specifications.

All copies of drawings, &c., supplied to contractor are to be returned to the engineer on completion of contract.

4. *Increase or Decrease of Works.*

The contractor is to execute in like manner and with the same quality of materials, as provided for the works, expressly mentioned in specification and drawings, any extensions, additions, deviations, alterations, or extra works which the engineer may require by an order in writing. Quality.

The work executed under this clause will be measured up and paid for at schedule rates in the same manner as provided for the other works under this contract; and if it comprise any work not specified in contract and in schedule of prices a special agreement shall be made between the engineer and the contractor, and signed at the time of giving the order for such work. Quantity. Prices of extra works.

In case the above-named parties shall be unable to agree on the value of such extra work, the engineer shall be at liberty and fully authorised to have it executed by whomsoever he may think fit. If value cannot be agreed upon.

No extra work, extensions, or any additions, deviations, or alterations whatever, which may be claimed by contractor, will be recognised or admitted under any circumstances if done or executed without, or contrary to, an order in writing from the engineer as aforesaid, and the production of such order shall be a condition precedent to contractor receiving payment for them.

The Minister, or the engineer, acting on his behalf, may from time to time, by writing under his hand, require the omission of any particular portion or part of the works described in the specification or shown on drawings; and the contractor shall have no claim for loss of profit, sustained damage, or other compensation on account of any such omission. Omission of portion of the work.

5. *Possession of Lands.*

The Minister shall, within one month from the date of the signing of the contract by the contractor, put the latter in possession of such parts of the land required for the execution of the permanent works and spoil banks, or access to either, as in the opinion of the engineer may be necessary for their commencement. And the Minister shall also from time to time put contractor in possession of such other parts of the land as may, in the opinion of the engineer, be necessary for the vigorous prosecution and timely completion of all the works. Lands to be provided by the Minister.

The contractor must, however, procure for himself all other land which he may deem requisite for any temporary purposes or for his own convenience; but the Minister will, at the expense of the contractor, and only to the extent of any legal powers possessed by the Governor or Minister, assist the contractor in procuring such land or in procuring materials suitable for the construction of the works from any adjoining lands. Land to be provided by Contractor.

Should any delay take place in giving to the contractor possession of any land required for the construction of the works aforesaid, such delay shall not be deemed a breach of contract, or give contractor any claim for compensation, but the contractor shall be entitled to a commensurate extension of time for the completion of the whole works. Delay in getting possession.

Nothing herein contained shall at any time prevent the Minister or any person duly authorised by him from entering upon and making use of such lands or any portion thereof for any purpose whatever. Possession not exclusive.

6. *Trespass.*

The contractor shall not enter upon any lands outside the limits of the lands defined by and held in possession by him under clause 5 hereof for the construction of the works or for any purpose whatever in connection with this contract, without the distinct consent in writing of the occupier and owner of such lands, and shall not, without the permission in writing of the engineer or superintending officer, remove any trees or structures within the limits of the lands defined in said clause hereof. Private lands. Nor

- Cutting of trees.** Nor shall he open or throw down any part of a fence without making sufficient provision by temporary fences, gates, or other necessary accommodation, to be erected and maintained at contractor's cost, for preventing persons or animals from trespassing or straying from, or into, any enclosure affected thereby.
- Roads.** Nor shall he interfere with any private or public road without making proper temporary provision for the convenience of owners or users thereof.
- Damage caused.** Any costs or damages incurred by the Government through any legal process on account of any trespass caused by the act or negligence of the contractor or his workmen shall be considered as payment made to the contractor under this contract, and shall be deducted accordingly at the time of final payment to him.
- If not fenced by contractor, engineer to have power to do so.** Should the contractor refuse or neglect to erect and maintain, either or both, any such temporary fences or other necessary accommodation, it shall be lawful for but not obligatory on the engineer after having given to the contractor twenty-four's notice in writing of his intention to do so, summarily and without further process to cause any such temporary hoarding, fences, gates, bridges, or other accommodation to be erected and maintained, which he may deem necessary for the proper protection either of such lands or of the adjoining lands, or for the safety of the property of the owners and occupiers thereof or of the general public, and the cost of so doing shall be deducted as provided hereinbefore.

#### 7. *Sub-letting, Assigning.*

- No sub-letting or assigning.** The contractor shall not sub-let any portion of the works, nor enter into any sub-contract for the execution thereof or any portion thereof, nor shall he assign all or any of the moneys payable or to become payable under the contract, or all or any part of any other benefit whatsoever arising to him or which may arise under the contract without the consent in writing of the Minister; and no assignment without such consent shall have any effect or be in any way recognised.

#### 8. *Progress of Works.*

- Work to be carried out under the direction of the Engineer.** It shall be lawful for but not obligatory on the Engineer or Superintending Officer to direct in writing the contractor to carry out the works in such order and in such manner as he shall deem fit; and
- If the contractor shall fail to make such progress with the works, as the Engineer or the Superintending Officer shall deem sufficient to insure their completion within the specified time; or
- If he refuse or fail in the opinion of the Engineer or Superintending Officer to use due diligence in carrying out any particular part of the work, which the Engineer or Superintending Officer shall have directed him in writing to carry out forthwith; or
- Non-compliance.** If he shall use or employ bad or insufficient material, or shall execute any work in an imperfect manner or not to the satisfaction of the Engineer or Superintending Officer; or
- If he shall fail or neglect to take down or remove such work, or to rectify any such work for seven days after being required to do so in writing by the Engineer or Superintending Officer; or
- If he shall fail to employ what, in the opinion of the Engineer or Superintending Officer, is a sufficient number of men on the works; or
- If he shall suspend work without the Engineer's order or sanction in writing; or
- If the contractor shall in the judgment of the Engineer commit a wilful breach of the contract;
- Then, in any of such cases, it shall be lawful for the Minister to do at his option any of the following things, that is to say:—
- (a) The Minister or the Engineer may, on giving written notice to the contractor of his intention so to do, forthwith cause additional men to be employed and additional materials and plant to be purchased, and the cost of so doing may be deducted from any moneys then due or which may thereafter become due to the contractor.
- (b) Or the Minister may, by notification in writing under his hand, delivered to the contractor, absolutely determine this contract without further process; and from and after the delivery of such notice as aforesaid, the contract shall be absolutely determined, and on such determination the money, which shall have been previously paid to the contractor under the contract, shall be deemed to be the full value of the work executed, and shall be taken and accepted by the contractor in full payment and satisfaction of all claims and demands under the contract; and the balances retained, including amount deposited as security, together with all materials and plant, then being in or near or upon the works for the purpose of being used or employed in or about the same, shall remain the absolute property of Her Majesty, and may be disposed of as the Minister may think fit.

#### 9. *Bankruptcy.*

- Bankruptcy.** If the contractor shall become bankrupt or insolvent, or shall make an assignment of his estate for the benefit of his creditors, it shall be lawful for the Minister, on behalf of Her Majesty, by notice in writing under his hand, to determine the contract by such notice, and for Her Majesty either to carry on the works under the Engineer's direction or to re-contract with another contractor to proceed with and complete the same upon such terms, stipulations, and conditions, as shall be deemed expedient by the Minister; and all the then remaining materials and plant may be used in, and applied for the purpose of, the works; and on the final completion of the works the surplus of such materials and plant shall be delivered to the contractor's assignees or trustees, but without any payment or allowance for any loss or diminution, wear, tear, or injury they may have sustained in the meantime; and any losses, damages, costs, or expenses, which shall, in the opinion of the Engineer, have been sustained by Her Majesty by reason of the premises, shall be deducted from the deposit money and the balance retained after payment of the progress payment; and the residue of such deposit money and percentages (if any), or any securities, in which the same may be invested (but without any interest thereon), shall belong and be paid or delivered to the said Assignees or Trustees; and if there should be no residue, but a deficiency, the amount of such deficiency may be proved for as a debt against the estate of the contractor.

#### 10. *Suspension and Completion.*

- Completion.** The whole of the works under this contract shall be completed on or before the day set forth in clause 1 of the special conditions as the "Date of Completion of Contract," and formally delivered up to the engineer in perfect order and repair, and to his entire satisfaction.
- Extension of time.** In the event of any alterations, deviations, additions, or extra works being required to be executed by contractor, or in the event of any delay arising under this clause, or under clauses 5 and 15 hereof, the engineer may allow such an extension of time (if any), as he shall think adequate for the proper carrying out of such alterations, deviations, additions, or extra works, or for the delay caused (if any).
- Liquidated damages.** The Minister, on behalf of the Queen, shall be entitled to deduct or set off for each and every week's delay after the date mentioned as the date of completion of contract, or after the expiration of the "extension of time" (if any), allowed under this clause, as and by way of liquidated damages, the sum mentioned in clause 2 of the special conditions.
- Such damages shall be deducted from the final balance and the cash security lodged by the contractor in accordance with clause 20 of these conditions and with clauses 5 and 6 of the special conditions, or, at the option of the Minister, from any other moneys payable to the contractor under this contract.
- Suspension.** On receiving a written notice to that effect from the engineer, contractor shall suspend the whole or any portion of the works, as may be directed in such notice. He shall have no claim for loss or damage on this account, unless the suspension exceeds one month, and such suspension shall in no wise vitiate the contract, but a commensurate extension of time for completing the works will be granted to the contractor.
- Testing.** When, in the judgment of the engineer, the whole of the works appear to be completed, they shall be tested or examined, as may be provided in the specification; if the result of the test or examination be satisfactory, they will be formally taken over by the engineer, or will issue a certificate to that effect, whereupon the period of maintenance shall begin.
- Maintenance.**

#### 11. *Safety of Works and Persons.*

- Reinstating defects.** Contractor shall be liable for the reinstating or making good of anything whatsoever, which may be removed, displaced, damaged, or destroyed during the performance of the works, or by reason of the same; and he shall also be solely responsible for all defects to, and failures in, the works, during the whole time of construction and the period of maintenance, whether the said defects arise from insufficient foundations, defective construction, bad materials, or any other cause within the contractor's control, or from the inclemency of the weather, landsprings, or similar cause.

Contractor

Contractor shall also provide and maintain all hoarding-barriers, night-lights, and properly-ballasted temporary roads, Hoardings, required by any municipal or other authorities having charge or control of streets or roads, or which may be required for the convenience or safety of the public; and he shall also make all arrangements by temporary roads or bridges or otherwise, roads, &c. which may be required by any local authorities or by the engineer, to prevent stoppage or delay of public traffic or any avoidable inconvenience to the public.

During the whole time of construction of the works, and during the period of their maintenance, contractor shall be liable for any accident, damage, or injury whatsoever to the public or to any individual, which may be caused by his operations or his neglect, and also for the safety of any adjacent roads, streets, cellars, vaults, pavements, walls, houses, and buildings, and shall be bound to remove any scaffolding, timbering, &c., as occasion may require or when ordered by the engineer to do so; and in case of emergency or probable danger to life or property the engineer, without notice to contractor, may there and then provide or employ, at contractor's cost, such labour, materials, and plant, as may be necessary to meet the exigency, of which the engineer himself shall be the sole judge. All such cost to be deducted from any sum then or thereafter due to the contractor under this contract. Liability for accidents, &c.

No opening is to be made in any street until a sufficient quantity of approved bricks or other material is on the ground to complete the length to be opened. Should any delay or dispute arise as to the supply of bricks or material, to prevent inconvenience to the public, the engineer shall have power to direct any opening made to be filled up and the surface restored at contractor's cost, amount to be deducted from any money due to the contractor.

#### *Agency, Notice, Right of Entry.*

When the contractor is not personally present on the works he must at all times during their progress have a responsible agent on the ground, who shall be deemed to be and shall be authorised to represent him for all purposes of this contract. Agency.

In case the contractor or his responsible agent shall not be immediately available at any point of the works, the instructions given by the engineer, in writing, to any overseer, foreman, or workman, employed on the works by contractor, shall have the same effect as if they were given to the contractor or his authorised agent.

Any written instrument or notice to be given or delivered to the contractor under this contract shall be deemed to have been so given or delivered when it is given or delivered to the contractor or his representative on the works, or left at the contractor's usual or last-known place of abode or business. Delivery of notice.

The engineer, and any other person duly authorised by him, shall have power at all times to enter upon all or any portion of the works; and to travel by any engine, lift, cage, carriage, truck, trolley, or other vehicle, which the contractor may be using on, or near, or in connection with the works; and to make examination of any work, fixed or unfixed, or in any state of progress, and of any materials or plant in use or intended to be used for the purposes of this contract; and the contractor shall give or afford facility for the exercise by the engineer and other duly authorised persons of the powers given under this clause, and shall for that purpose cause the motion of any vehicle, engine, or other machinery to be arrested when requested so to do. Entry on works.

Due notice shall be given by contractor to the superintending officer or overseer before any piles are swung and commenced to be driven; on the completion of all excavations for foundations, or otherwise, and before any foundations are laid therein; when foundation-rings for wells are to be laid, and before the well-sinking commences; before the filling in of the wells, of other structures, or of sewer or pipe trenches is proceeded with; before centres are struck; before and after tunnel soles are laid, and at such other stages of progress of the works, as may be specially directed in the specification. Progress notice.

#### *13. Dismissal and Mode of Payment of Men.*

The engineer or superintending officer may, for incompetency or misconduct, or inattention to orders, or other sufficient cause, require the dismissal within twenty-four hours by the contractor of any agent, overseer, foreman, workman, or other person, employed by him on the works; and in the event of the contractor refusing or neglecting to comply with such requisition all further payments on account of the contract may be stopped until such dismissal is carried out. Dismissal.

The workmen, tradesmen, and labourers of every class or kind, employed on the works under this contract shall be paid their wages or other earnings in full in money, current coin of the Colony, at least once in every fortnight, and no ticket or other system of payment by goods of any sort, provisions, or liquor will be allowed on any pretence whatever. Cash payment

Nor shall the contractor or any person employed by him, or in any way connected with him, establish any shop for the supply of liquors, provisions, or goods, nor shall the contractor cause or oblige his workmen to take their necessaries or goods of any kind from any person in particular. Truck system.

The workmen or labourers of every kind or class shall be paid on the works (if it be possible) or in some building adjoining; and in no case shall they be paid at a public-house or other place where spirituous or fermented liquors or refreshments are sold.

Before the payment of any money to the contractor, the Minister may require from the contractor a statutory declaration that the tradesmen and labourers of every kind employed on the works to which these conditions refer have been paid their wages and claims of every kind in full money, the current coin of the Colony, and to the latest date to which such wages or claims are due; and the Minister may withhold the payment of any money that may be due or become due to the contractor until such declaration shall have been made and delivered to him. Statutory declaration.

#### *14. Material.*

All approved materials, plant, and prepared work brought upon the ground for use in or on the works shall be considered, and shall be the property of Her Majesty the Queen until completion of contract; and contractor shall not take away, remove, or dispose of any such material or plant or prepared work without the written authority of the superintending officer. Ownership.

All materials supplied by contractor for, and used in, the works shall be the best of their respective kinds, and in conformity with any further particular direction that may be contained in the specification. Quality.

Due notice shall be given by contractor to the superintending officer and overseer when any material is bought on the ground, all of which must be neatly stacked in regular heaps, submitted for approval, and approved of in writing by the superintending officer, before it may be used in the works; none but that so approved shall be used. Arrival on ground.

The contractor, if so directed, shall remove entirely off the ground any inferior or improper material, or alter or remove any improper or unworkmanlike work at his own expense within twenty-four hours after a written notice in that behalf shall have been served upon him by the engineer or superintending officer. Approval.

After the expiration of the time stated in such notice, it shall be lawful for, but not obligatory upon, the engineer or superintending officer at any time to remove and, if necessary, to destroy any such material, or to pull down or alter any such work, and to replace or rebuild the same. The expense of so doing shall be deducted from any moneys then due, or that may thereafter become due, to the contractor under this contract.

Cement is to be brought on the ground in quantities of not less than fifty barrels, at least ten clear days before it is intended to be used in the works, and kept in weather-tight sheds under lock and key. After having been tested and approved of, the approved barrels will be marked on the outside, and their contents may be used. After they are empty, they shall, in the presence of the superintending officer or any person deputed by him, be broken up, and thereupon removed off the works. Storing.

The use by the contractor on the works of blasting-powder or any other explosive material shall be confined strictly to the limits, which will be set by an order in writing of the engineer as to locality, time, quantity, particular kind of material, and precautions to be taken during its use. Explosives.

In any case, no larger quantity of explosive material shall be taken underground than is likely to be used during any current shift. Quantities.

Storing of explosive material underground shall be, and hereby is, absolutely prohibited; and for its storage on the surface special directions will from time to time be issued by the engineer in accordance with the provisions of the Act regulating storage and conveyance of explosives. Storing underground prohibited.

Should contractor exceed the limits of such order, or not strictly observe the special directions in regard to use, the engineer shall have power to appoint, at the contractor's expense, inspectors of powder, in whose presence alone explosives may be made use of, and who shall have entire charge of all matters connected with their storage or supply to the works. Inspectors of powder.

**Reduced prices.** If the contractor shall be found to have supplied materials or executed work not in accordance with the true intent and meaning of the specification and conditions of this contract, and if the engineer shall elect to allow such materials to be used or such executed work to remain, he shall have power to fix the price to be paid for any such material or work, and contractor shall be bound by the engineer's valuation.

#### 15. Government Property.

**Delivery.** Should the Minister furnish to the contractor for the purposes of this contract, any materials, or plant, or other article of value, all of which are hereafter in this clause and in the specification included under the term "Government property," the contractor shall give a detailed receipt in writing to the superintending officer at the time of delivery and before taking possession thereof.

**Protecting.** If required to do so by the superintending officer, contractor shall erect, at his own expense, sheds or other covering to protect such property from the weather or from theft.

**Repairs.** He shall likewise make good any loss or injury which may happen to it from any cause whatever, and shall keep it in good and sufficient repair and renew all moving and working parts, which may have become worn out, to the satisfaction of the engineer or superintending officer during the whole time it is under his care.

**Returning.** On the completion of the contract, all such property shall be returned to the engineer, unless otherwise directed in the specification; and for that purpose shall be removed, after having been put into a thorough state of repair, to the place or places mentioned in the specification, and there neatly stacked or arranged, as the superintending officer may require.

**Discharge.** The latter shall thereupon give a detailed receipt in writing for everything so returned, and until such receipt shall have been given the property shall be deemed to be, and shall be, under the care of the contractor.

**Delay in delivery.** Should any delay occur in supplying contractor with any drawings, or specifications, or any Government property which may be specified to be supplied or delivered to contractor by the Minister, the contractor shall have no claim for compensation for any such delay other than that (if any) particularly set forth in the specification; but the contractor shall be entitled to such reasonable extension of time for the completion of the works as shall be fixed by the engineer.

#### 16. Measurements, Quantities, and Accounts.

**Net measurements.** Except in cases for which the specification distinctly prescribes another method or rule of ascertaining measurements or weights, the *net* measurements, according to the actual dimensions or weights, will always be taken, notwithstanding any custom to the contrary. The surplus soil to be removed shall be calculated as equal to the volume of the soil actually displaced by the foundations, sewers, shafts, or other works.

**Quantity.** The distance of removal shall be measured from top of shaft or end of open cutting to centre of spoil-bank or other place of deposit. The schedule price for excavation shall cover all haulage in tunnels or cuttings, unless otherwise specified.

**Lead.** The contractor shall be present at all measurements, and, if required, assist in making the same. If he fail to attend after twenty-four hours' notice in writing has been delivered to him of the superintending officer's intention to take measurements and clearly setting forth the locality of such intended operation, the measurements made by the superintending officer shall be binding on the contractor.

**In contractor's presence.** On the satisfactory completion of any part or portion of the works, and at all other suitable times, the dimensions of such piece of work shall be measured by the superintending officer, recorded on drawings, kept or to be made for the purpose, and the quantities ascertained therefrom and entered into a quantity book, to serve as basis for arriving at the contract sum on completion of the contract.

**Time.** Within forty-eight hours of such measurement having been effected, contractor shall furnish to the engineer an account of the work, thus intended to have been finally measured up, showing in detail the dimensions, quantities, prices, and value, specifying day of measuring, in whose presence measured, and signed by contractor.

**Check accounts.** For the purpose of making progress payments the dimensions of still unfinished, but otherwise satisfactorily performed, portions of the work will be measured in a summary way monthly, or as near as may be, but without prejudice to the ultimate acceptance or rejection of such portions of work.

**Progress measurements.** On the day following the conclusion of such summary measurement, contractor shall furnish to the superintending officer an account of all work done during the preceding month, giving detail, quantities, prices, and approximate value of all unfinished work, and, for every structure separately, total quantities, prices, and exact value of all completed work.

**Monthly accounts.** Any final account to be presented by the contractor must be on similar form, and under the same heads as the printed tender form, with additional items at foot of same.

**Final account.**

#### 17. Jobbing.

**Jobbing.** When desired by the superintending officer so to do, contractor shall furnish to said officer any skilled artisans, labourers, or carts with horses and drivers, for the performance of such services as the aforesaid officer may desire to be performed in connection with, for, on, or near the works under the contract.

**Paid monthly in full.** Contractor shall supply those artisans, labourers, &c., with the necessary plant and lighting, and shall be paid for all services thus rendered the full amount, provided therefor in the schedule of prices, under the head of "jobbing," at the end of every month, or as nearly as may be thereafter. The accounts for this "jobbing" shall, however, be rendered by contractor to the superintending officer or overseer in half-weekly intervals, that is to say, during the forenoon of every Monday and Thursday, failing which he shall lose all claim to payments for the jobbing performed by him during the preceding three days.

**Half-weekly accounts.**

#### 18. Progress and Final Payments.

**Monthly progress payments.** No payments shall be legally due to contractor until after the entire completion of the contract; but progress payments on account, subject to all deductions, herein provided for, will be made monthly, or as nearly so as may be, during the continuance of the contract, on the certificate in writing of the engineer, at rates not exceeding those stated in clause 4 of the special conditions.

**Balance.** The balance of the moneys due for works executed under this contract, less 5 per cent., and less the deductions properly to be made hereunder, will be paid within thirty days, or as nearly as may be, after the engineer shall have certified under his hand that all the works under the contract, less those of maintenance, have been fully and satisfactorily completed, and that such balance, less the 5 per cent., is due to contractor.

**Insufficient balance.** Provided that if the amount for maintenance, as entered by contractor in his tender, shall appear to the engineer to be insufficient, the Minister may retain, on the declaration to that effect in writing by the engineer, either the whole or any part of the sum, otherwise deemed payable to contractor, till all the works under the contract, including those of maintenance, shall have been finally and satisfactorily executed.

**Final payment.** The said five (5) per cent., together with the "cash security," provided for in clause 20 of these conditions, will be retained until after the expiration of the "period of maintenance," more particularly described in clause 3 of the special conditions, and shall be paid to contractor (less the costs of any repairs or defects, should the contractor fail to execute the same), on the production of a certificate from the engineer, that all the works under the contract, including those of maintenance, have been finally and satisfactorily executed.

**No progress payment after expiration of contract time.** No progress payments will be made after the date specified for the completion of the contract, until the whole of the works shall have been properly completed to the satisfaction of the engineer.

**Suspension of payment.** If, in the opinion of the engineer, further inquiry is desirable or necessary, before payment is made on any certificate, the engineer shall have power to suspend the payment of all or any part of the amount mentioned in any such certificate, for a period not exceeding one month from the date at which, in the ordinary course, the money would have been paid, and no interest shall be due or accruing on any money, the payment of which shall have been so suspended.

**Certificates without prejudice.** No certificate, given to the contractor for any purpose whatever during the progress of the work, shall prevent the engineer, at any time before the final payment, from rejecting any unsound material or improper workmanship, which may be discovered in the work, or from requiring the contractor to remove or amend at his own cost any work which may be found not to have been performed in accordance with the contract, or from deducting from any money, which may be due or become due to the contractor, the whole amount, which may have been paid to the contractor for such material or work.

**No claim without certificate.** The obtaining of the engineer's certificate that all the works under the contract, including those of maintenance, have been finally and satisfactorily executed, shall be a condition precedent to any claim or cause of action in respect of work done, as well as to the final payment to be made hereunder.



19. *Arbitration Clause.*

1. All questions or disputes which shall arise respecting the true construction or meaning of the drawings or specification, or the quality of the workmanship, or quantity or quality of materials necessary for the whole or any part of the contract, and all questions and disputes respecting the matters next hereinafter mentioned, when the aggregate amount claimed in respect of such last-mentioned matters shall not amount to the sum of one thousand pounds, shall be decided by the Engineer-in-Chief for Roads, Bridges, and Sewerage, whose decision shall be absolute and final.

2. But all questions as to the cancellation of the contract, as to the right of the contractor to extension of time, as to the infliction of penalties, as to the true value of any extra work that has not been previously agreed upon, or as to the value of work omitted from the works specified to be done under the contract, shall, if the aggregate amount of the claims in respect of such matters shall be one thousand pounds or upwards, upon the completion of the works under the said contract, and before payment of the retention money and the money deposited as security for the due carrying out of the contract, be fixed and determined by arbitration as hereinafter provided.

3. If the contractor, or the Minister in charge of the department under which the works in the contract have been or are being carried out, considers that he has claims in respect of the several matters mentioned in paragraph 2, as those in which arbitration may be claimed, he shall furnish to the other of them full particulars in writing of such claims, breaches, doubts, disputes, and differences in respect of which he desires arbitration, giving distinct and separate items, and the amount, if any, claimed under each item; and the other party may thereupon furnish particulars of all claims he has in respect of such matters, irrespective of the aggregate amount of such claims; and the party furnishing the same shall be bound by such particulars; and no claim not included in such statement shall be taken into consideration at such arbitration, or become subject of arbitration or action; and the claim or respective claims so made as aforesaid shall be determined by arbitrators, to be appointed as hereinafter provided, that is to say—

4. If the Engineer-in-Chief for Roads, Bridges, and Sewerage, and the contractor concur in the appointment of a single arbitrator, then the matter and question aforesaid shall be referred to and decided by such single arbitrator; but if the Engineer-in-Chief for Roads, Bridges, and Sewerage, and the contractor cannot concur in the appointment of a single arbitrator, each party, on the request in writing of the other party, shall, by writing under his hand, nominate and appoint an arbitrator, to whom the said questions and matters shall be referred. Every such appointment shall be delivered to the arbitrator, and be deemed a submission to arbitration on the part of the party by whom the same shall have been made, and neither party shall have power to revoke the same without the consent in writing of the other, nor shall the death of either party operate as a revocation.

5. And if, for twenty-one days after the notice in writing by the contractor or by the Engineer-in-Chief for Roads, Bridges, and Sewerage, that the contractor and the Engineer-in-Chief for Roads, Bridges, and Sewerage cannot agree shall have been served, and for seven days after a request in writing to appoint an arbitrator shall have been served by the one party on the other, such last-mentioned party fail to appoint such arbitrator, then, upon such failure, the party making the request, and having himself appointed an arbitrator, may appoint such arbitrator to act on behalf of both parties; and the arbitrator may proceed to hear and determine the matter or question between the contractor and the engineer aforesaid, and in such case the award or determination of such single arbitrator shall be final. If, before the matter so referred shall be determined, either arbitrator shall die or become incapable, the party by whom such arbitrator was appointed may nominate and appoint some other person as arbitrator to act in his place; and if, for the space of seven days after notice in writing from the other party for that purpose, he fail to do so, the remaining or other arbitrator may proceed *ex parte*; and in case the matter in dispute shall stand referred to a sole arbitrator in default of the appointment by the other party, and such sole arbitrator shall die, the party by whom he was appointed shall appoint another sole arbitrator in his place; and every arbitrator so to be substituted in either of the cases aforesaid shall have the same powers and authorities as were vested in the former arbitrator at the time of his death or disability.

6. If more than one arbitrator shall be appointed, such arbitrators shall, before they enter into the matter or question referred to them, nominate and appoint, by writing under their hand, an umpire to decide on the matter so referred; and if such umpire shall die or become incapable of acting, they shall forthwith, after such death or incapacity, appoint another umpire in his place, and the decision of every such umpire on the matters referred to him shall be final.

7. If, in either of the cases aforesaid, the said arbitrators shall refuse, or shall, for seven days after request of either party, neglect to appoint an umpire, a Judge of the Supreme Court, upon application made to him by either party, shall appoint an umpire, whose decision shall be final.

8. If a single arbitrator shall be appointed, and he shall die or become incapable to act before he shall have made his award, the matters referred to him shall be determined by arbitrators appointed hereunder as if the arbitrator so dying had not been appointed.

9. If more than one arbitrator be appointed, and either of them shall refuse, or for seven days neglect to act, the person by whom such defaulting arbitrator was appointed shall, within seven days after notice in writing, proceed to appoint another arbitrator to act for the arbitrator so refusing or neglecting, or the other arbitrator may proceed *ex parte*; and the decision of such other arbitrator shall be as effectual as if he had been the single arbitrator appointed by both parties.

10. If more than one arbitrator shall be appointed, and neither of them shall refuse or neglect to act as aforesaid, then if such arbitrators shall fail to make their award within thirty days after the day on which the last of such arbitrators shall have been appointed, or within such further time as may be granted by a Judge of the Supreme Court on application by either party, the matters so referred to them shall be determined by the umpire appointed as aforesaid.

11. The arbitrators, or any two of them, shall have power to hear, receive, and examine evidence; and the witnesses on any reference herein may be examined on oath and affirmation. Neither of the parties hereto shall be at liberty to appear before the arbitrators by counsel or solicitor.

12. The award of the arbitrator or arbitrators or umpire shall be in writing, ready to be delivered to either party within the time appointed for making the said award. This submission may be made a rule of the Supreme Court. The amount of costs, umpire's and arbitrators' fees, shall be decided by the arbitrators, arbitrator, or umpire; the amount of costs including arbitrators' and umpire's fees and witnesses' expenses, the items thereof being shown in the account annexed to said award.

13. If upon an arbitration in respect of claims made by the contractor the sum awarded to the contractor shall be less than one-half of the amount of his said claim, all the costs, charges, and expenses of and incident to the said arbitration and award shall be borne and paid by the contractor; but if the amount awarded shall exceed one-half of the amount of the said claim, then each party shall pay his own costs and one-half of the arbitrator's and umpire's fees.

14. It is to be distinctly understood that all claims by the contractor or by the Minister to have any of the matters which under paragraph No. 2 may be submitted to arbitration so dealt with, must be made upon the whole of the work being completed, and before payment to the contractor of the retention money or of the money deposited as security for the due performance of the contract, and that the acceptance by the contractor of payment of the retention money in cases where a bond to secure the completion of the works has been given, and in other cases of the retention money or of any balance thereof, and of the money deposited as security for the due performance of the contract, shall be conclusive proof that the contractor has no such claim or claims.

15. The Engineer shall not be required to defend or answer, or be made a party to, any bill, claim, or action, or other proceedings at law or in equity at the instance of the contractor. Engineer no party to lawsuits.

16. The exercise by the Minister, Engineer, or Superintending Officer, of any of their respective powers shall not relieve the contractor from any liability, to which he may be subject for any breach of the contract. Liability to remain.

17. None of the clauses or provisions of the specification, or of these conditions, or of any other part of this contract, shall be varied, waived, discharged, or released, either at law or equity, unless by the express consent in writing of the Minister. Provisions not to be varied.

20. *Tender, Cash Security, &c.*

Tenders to be sent in on a private form, accompanied by the printed schedule of prices, with all the blanks properly filled in, and addressed, as directed in the advertisement, calling for tenders. Form of tender.

The approximate quantities only are given as a guidance to intending contractors, and the contract being at a schedule of prices, will be subject to such extensions, extras, additions, deductions, enlargements, deviations, alterations, and omissions as therein provided. The Minister will be only liable to pay for the actual measured quantity of each respective kind of work done and ordered at the rates set forth in the schedule, and if there be no rate in the schedule for any that may be ordered, then at such rate as shall be fixed by the Engineer-in-Chief, whether such measured quantities shall be less or more than the quantity stated in the schedule of quantities and prices. Schedule rates of contract.  
Every



Deposit with tender.

Every tender must, as a guarantee of good faith, be accompanied by a preliminary deposit, calculated according to the following scale, viz. :—For amounts of £300, and up to £500, £5; for amounts exceeding £500, and not exceeding £1,000, £10; for all sums over £1,000, 1 per cent. on the amount of tender up to a maximum deposit of £500. Such deposit to be in the form of a Treasury deposit receipt, or a cheque in favour of the President of the Board, endorsed by the manager of the Bank upon which it is drawn. Any tender which may be received without such preliminary deposit shall, unless otherwise directed by the Board, be deemed to be informal, and rejected accordingly.

Returning of preliminary deposit.

All deposits, with the exception of that of the lowest tenderer, when practicable, will be returned by the Secretary to the persons entitled thereto, immediately after the Board shall have adjourned, and the deposit made by the successful tenderer shall be returned to him on his executing the bond for the fulfilment of the contract.

Cash security.

Within seven days from the date of notification in writing to any tenderer of the acceptance of his tender by the Minister, the successful tenderer must lodge with the Colonial Treasurer in cash, the sum named in clause 6 of the Special Conditions, which sum will be retained as security for the due performance of the contract, until after the expiration of the "period of maintenance," and returned to the contractor (if at all) only on the day of final payment, and less any deductions, which hereunder may properly be made therefrom.

Signing of contract.

Within three days after lodging the aforesaid deposit, the successful tenderer shall attend at the office of the Crown Solicitor, and execute the contract.

Forfeiture of cash security.

In the event of any tenderer failing to take up his tender, complete the bond, and proceed with the contract, within the time specified, all moneys deposited by him on account of such contract shall be absolutely forfeited to the Crown, and shall be paid to the credit of the Consolidated Revenue of the Colony, and the Minister shall be at liberty to accept next lowest or invite fresh tenders.

Lowest or any tender.

The Board shall not be bound to accept the lowest or any tender.

Stamps, fees, &c.

The contractor shall bear and pay all duty stamps, licences, building, or surveyor's fees, or other charges or fees whatsoever, legally demanded by any municipal or other authorities; also the amount of all patent rights and royalties, due to any patentee.

Commencement of work.

No tenderer will be allowed to proceed with the work tendered for until he shall have signed the required contract.

ROBT. HICKSON,  
Engineer-in-Chief for Sewerage.

Department of Public Works, Sewerage Branch,  
Sydney, 22nd January, 1891.

These are the General Conditions marked "B" referred to in our annexed Agreement with Her Majesty the Queen, dated the 16th day of March, A.D. 1891.

Witness—HAROLD F. NORRIE, J.P.

JOHN CARTER.  
D. G. SNODGRASS.  
GEO. FORREST.

"D."

#### SPECIAL CONDITIONS.

##### Clause 10 of General Conditions.

1. The "date of completion of contract" shall be eight months from the date of acceptance of tender—that is to say, the 28th day of October, 1891.

##### Clause 10 of General Conditions.

2. The sum to be deducted or set off as or for "liquidated damages," shall be £20 sterling a week.

##### Clauses 2, 10, and 18 of General Conditions.

3. The "period of maintenance" shall be three calendar months from the date of the certificate of the engineer that all the works under the contract, less those of maintenance, have been fully and satisfactorily completed.

##### Clause 18 of General Conditions.

4. The "rates of progress payment" shall be 90 per cent. of the value of work actually done, performed, and delivered, as the engineer may approve of as fit and necessary for the work.

##### Clause 20 of General Conditions.

5. The "Treasury deposit receipt" to accompany the tender shall be as required by clause 20 of the general conditions.

6. The sum to be lodged with the Under Secretary for Public Works as security shall be a Bank deposit receipt, in the name of the Secretary for Public Works, for £900 sterling.

##### Clause 2 of General Conditions.

7. Even after the expiration of the period of maintenance, contractor will still be held liable for all defects in the works which were not visible, or which may have been kept secret, at the time of the works being taken over by the engineer, since he is, and hereby distinctly agrees to be, *responsible for all faults or neglects of, or all deception practised by, his agents, overseers, or workmen, irrespective of the time at which such faults, neglects, or deceptions may be detected.*

##### Clause 3 of General Conditions.

8. Although the information in possession of the Government has been freely placed at the disposal of the tenderers, by being noted on the drawing or otherwise, the Government undertake no guarantee whatever regarding the kinds of soil that will be met with, or the firmness or stratification of the ground to be excavated, or the amount of unwatering to be done, or the strength of the timbering that may be required, or the nature and extent of other precautions which may have to be adopted.

##### Clause 4 of General Conditions.

9. Contractor shall not be entitled to claim or receive any compensation whatever over and above payment for the actual increase of quantities at schedule rates, and where there are no schedule rates, at such rates as shall be determined at the time by the Engineer-in-Chief, for any additions to, deviations from, or alterations of the various designs comprised in this contract. These conditions shall also apply to, viz., variations in manholes, flushing chambers, &c., and in consequence of meeting with any existing gas, water, or sewer pipes or sewers, as referred to and in accordance with clause 115 of the specification, the position of which it is impossible to ascertain until the ground for the construction of the works comprising this contract is opened up,—

Variations in inclination of slopes and gradients.

„ lengths of open trenches.

„ depth, shape, or size of excavation for sewer, &c.

„ depth, shape, or size of concrete of sewers, manholes, flushing chambers, &c.

„ internal diameter of pipe sewers.

„ alteration or extension of sewer lines.

Any decrease in quantities to be deducted as provided for.

##### Clause 14 of General Conditions, paragraph 6.

10. Cement is to be brought on the ground in quantities not less than fifty barrels, provided that this quantity is sufficient for fourteen days' supply, but in no case is less than fourteen days' supply (whatever that may prove to be) to be brought on the ground in one parcel; nor is the supply stored on works to be at any time less than fourteen days' supply.

Clause

Clause 8 of General Conditions.

11. Suspension of works and non-compliance with clauses 64, 95, and 116 of the specification on the part of the contractor shall constitute a wilful breach of contract.

Clause 18 of General Conditions.

12. The acceptance by contractor of the final payment shall be deemed equivalent to a distinct declaration on his part that he has no further demands on the Government in respect to this contract.

These are the special conditions marked "D," referred to in our annexed agreement with Her Majesty the Queen, dated the 16th day of March, A.D. 1891.

Witness.—HAROLD F. NORRIE, J.P.

JOHN CARTER,  
D. G. SNODGRASS,  
GEO. FORREST.

TENDER FOR CONTRACT No. 72, SYDNEY AND SUBURBS STORM-WATER DRAINAGE.

To the Honorable the Minister for Public Works, Bridge-street, Sydney, N.S.W.

I [We], the undersigned, do hereby tender and offer to construct, completely finish, and maintain the various works for contract No. 72, Sydney and Suburbs storm-water drainage, in accordance with the conditions of contract, specifications, and drawings, prepared for that purpose in your Department, for or at the rates particularly entered in the accompanying Schedule of Prices, and enclose herewith Treasury Deposit as required by clause 20 of the General Conditions.

Should this tender be accepted I [we] undertake to lodge with the Under Secretary for Public Works, within seven days from the notification of the acceptance of this tender, a bank deposit receipt, in the name of the Secretary for Public Works, for the sum of £900 sterling, as security for the due performance of the contract.

In the event of my [our] failing to do so, or to sign the required contract within the time specified in clause 20 of the General Conditions, I [we] hereby distinctly agree to forfeit to the Queen the sum deposited with this tender.

(Date.)

Name } of Firm (if any.)  
Address }  
Name }  
Address } of Partners (if any.)  
Name }  
Address }

CONTRACT No. 72.—Schedule of quantities and prices for constructing and completing concrete and stoneware pipe storm-water sewer, from Munni-street along Macdonald-street to Mitchell Road and Shea's Creek, with manholes, flushing chambers, junctions, &c., subject to omissions, additions, deviations, or alterations, as provided. The quantities in this schedule are not guaranteed as correct, but are merely given for the guidance of intending contractors, this being a Schedule of Prices Contract.

| No. of Item.     | Description of Works.  | Unit.       | Probable Quantity. | Rate per unit. | Amount. |
|------------------|--|-------------|--------------------|----------------|---------|
| 1                | General excavation in open trenches for sewers, junctions, curves, manholes, pipe-drains, &c., including grubbing, clearing, timbering, unwatering, road restoring, coffer-dam, removing of old stone abutments and timber-decking of existing road bridge, depositing the excavated materials beyond actual site of works in separate spoil-banks, complete, as specified in clauses 34 to 36, and 37 to 54 inclusive   | cubic yard  | 26,200             | ...            | £ s. d. |
| 2                | Filling in below, at sides, and over sewers, junctions, curves, manholes, into abandoned open channels, road embankment, &c., including the providing of quarry filling, lead from sites of excavations or temporary spoil-banks, or any other sources outside the limits of this contract, to the place of permanent deposit, breaking, road restoring, ramming, watering, leading surplus and rejected material to spoil, as specified in clauses 47, 50, 51, 53 to 62, inclusive..... | "           | 12,000             | ...            | .....   |
| 3                | Sodding at both sides of new channels, and where ordered, complete, as specified in clause 63  | square yard | 1,000              | ...            | .....   |
| 4                | Brickwork, any thickness, shape, arched, &c., where ordered, in any situation, as specified in clauses 96 to 99.....   | cubic yard  | 110                | ...            | .....   |
| 5                | Sandstone concrete, any shape, form, thickness, arched, &c., where ordered, in any situation, as specified in clauses 78 to 95, inclusive  | "           | 8,100              | ...            | .....   |
| 6                | Cement facing $\frac{5}{8}$ in. thick, where ordered, in any situation, as specified in clause 112   | square yard | 11,600             | ...            | .....   |
|                  | Providing, laying, and jointing glazed stoneware plain pipes, in trenches, and where ordered, including fixing discs, as specified in clauses 16, 40 to 42, 44, and 73 to 77 :—  |             |                    |                |         |
| 7                | 24 in. internal diameter   | lineal feet | 250                | ...            | .....   |
| 8                | 21 in. " "   | "           | 20                 | ...            | .....   |
| 9                | 18 in. " "   | "           | 550                | ...            | .....   |
| 10               | 12 in. " "   | "           | 20                 | ...            | .....   |
| 11               | 9 in. " "  | "           | 20                 | ...            | .....   |
| 12               | 6 in. " "  | "           | 20                 | ...            | .....   |
| 13               | Less than 6 in. " "  | "           | 20                 | ...            | .....   |
| 14               | Providing and fixing in position hardwood timber in piles, walings, sheet piling, including ironwork, as specified in clause 71  | cubic feet  | 600                | ...            | .....   |
| 15               | Providing and fixing in position hardwood timber in platform, including ironwork, as specified in clause 70, where ordered   | "           | 600                | ...            | .....   |
| 16               | Timber, ordered in writing, to be left in excavations, as specified in clause 43, including all iron used in fixing same   | "           | 600                | ...            | .....   |
| 17               | Sandstone pitchers, laid where ordered, as specified in clause 114   | square yard | 40                 | ...            | .....   |
| <b>IRONWORK.</b> |  |             |                    |                |         |
| 18               | Providing, delivering, and fixing in position, girders, including bedding same on special mortar, as specified in clauses 91 and 102 to 107  | cwt.        | 74 cwt. 22 lb.     | ...            | .....   |
| 19               | Providing, delivering, and fixing cast-iron gratings, as specified and shown on Drawing No. 5, weighing 4 cwt. each, as specified in clauses 90 and 108 to 111   | each        | 32                 | ...            | .....   |
| 20               | Cast-iron ventilating grates, with square frames, 22 in. diameter internal opening, tarred sawn hardwood bricks in centre, fitted into panels, circular dirt-box 8 in. deep, complete, as shown on Drawing No. 5, and as specified in clauses 90 and 108 to 111, placed in position, weighing each about 9 cwt.  | "           | 6                  | ...            | .....   |

| No. of Item.        | Description of Works.   | Unit.      | Probable Quantity. | Rate per unit. | Amount. |
|---------------------|---|------------|--------------------|----------------|---------|
| <b>GENERAL.</b>     |   |            |                    |                |         |
| 21                  | Special bluestone concrete (clause 26) where ordered in any situation, in the construction of these works .....   | cubic yard | 5                  | ...            | .....   |
| 22                  | Permanent puddle, where ordered in any situation in the construction of these works (temporary puddle ordered for the purposes of execution of work not to be paid for) ..... | "          | 5                  | ...            | .....   |
| 23                  | Bluestone metal (clause 19) 1½ in. gauge, stacked .....   | "          | 5                  | ...            | .....   |
| 24                  | Bluestone metal (clause 31) 2½ in. gauge, stacked .....   | "          | 5                  | ...            | .....   |
| 25                  | Sharp, clean, washed sand, stacked .....  | "          | 5                  | ...            | .....   |
| 26                  | Oregon timber, in scantlings or planks .....  | cubic foot | 100                | ...            | .....   |
| 27                  | Wrought-iron in bolts, screws, nails, spikes, and galvanised step-iron .....  | lb.        | 1,000              | ...            | .....   |
| 28                  | Portland cement .....   | cask       | 5                  | ...            | .....   |
| 29                  | Artisan or mechanic, supplied by contractor .....   | day        | 10                 | ...            | .....   |
| 30                  | Quarryman or other skilled labourer supplied by contractor.....   | "          | 10                 | ...            | .....   |
| 31                  | Ordinary labourer, supplied by contractor .....   | "          | 10                 | ...            | .....   |
| 32                  | Cart with one horse and driver, supplied by contractor .....  | "          | 5                  | ...            | .....   |
| 33                  | One additional horse, supplied by contractor .....  | "          | 5                  | ...            | .....   |
| <b>MAINTENANCE.</b> |   |            |                    |                |         |
| 34                  | Three months' maintenance after formal delivery of works .....  | lump sum   | .....              | ...            | .....   |
| Total .....         |   | .....      | .....              | ...            | .....   |

## Notes.

- All work herein enumerated shall be understood as being placed in position where specified and ordered, and in complete working condition, in accordance with the specification.
- The above Schedule Prices include, in every case, continual maintenance of the works during the whole time of construction, and up to the day of their being formally taken over by the Engineer.
- Prices for items Nos. 29, 30, 31, 32, and 33 are to be for such as are able-bodied and efficient. The schedule rates per day are for the day of eight hours. In the event of overtime and night-work being ordered, it is to be paid for at 25 per cent. advance on the time rates set down for day-work.
- The whole of the foregoing prices to include all labour, tools, implements, plant, machinery, shoring, timbering, centring, concrete boxes, unwatering, coffer-dams, fluming, temporary bridges, roads, pumping, gasket filling, diverting water-courses and surface water, diverting and maintaining the traffic along roads, crossing over pipe-sewers, disposal and removal of surplus soil, reinstating all roads and other surfaces, &c., and any other thing necessary in executing and completing each respective item, in accordance with plans and specifications.
- Tenderers are to state prices for all items, whether quantities are given or not.

## No. 6.

## The Supervising Engineer to The Principal Assistant Engineer for Sewerage.

Contracts Nos. 72 and 75.—Arrangement for passing through Cooper's land.

Roads and Bridges and Sewerage Branch, Sydney, 25 March, 1891.

I HAVE had two interviews with Mr. R. J. Hill respecting the Munni-street to Shea's Creek and the Macdonaldtown Park stormwater sewers, Contracts Nos. 72 and 75, which pass through Cooper's Estate. I also went over the ground with Mr. Fisher, surveyor to the Cooper estates. Mr. Hill informed me at the second interview that he had no objection to these stormwater sewers being constructed as proposed through the Cooper Estate without the land being resumed, provided:—

- That arrangements be made in the sewer to turn the Macdonaldtown stream to M'Namara's wool-washing establishment when it is required; and
- That the Alexandria stream be flumed over the sewer and allowed to flow to M'Namara's wool-washing establishment as at present.

I recommend that such a letter as the one I have drafted and attached be forwarded to Mr. Hill asking him to give the permission in writing.

J. DAVIS.

## No. 7.

## A. J. M'Cormack, Esq., to The Water and Sewerage Board, Sydney.

Sydney, 8 April, 1891.

I have been informed by Mr. Henry M'Namara, of this city, that his fleeces and skins at his wool-washing establishment at Clear Valley, Alexandria, have been damaged, and in some cases rendered useless, owing to the smoke and smut from fires made by your employees in connection with the works at Shea's Creek.

He has also been seriously hampered in his business of wool-washer at that place.

He has, therefore, instructed me to ask for compensation, and unless a fair and reasonable compensation is offered, my instructions are to commence legal proceedings without further notice. An early reply will oblige.

Yours, &amp;c.,

A. J. CORMACK (per E.H.G.).

Refer to Engineer-in-Chief for Harbours and Rivers and inform accordingly.—W.B., B.C., 9/4/91. Informed, No. 758 of 9/4/91. Mr. Williams,—Please report at once for Engineer-in-Chief.—J.McL., 13/4/91. Separate report herewith.—A.W., 14/4/91.

## Minute Paper.

Subject:—Respecting the complaint of Mr. Henry M'Namara that the fires made by the men employed at Shea's Creek interferes with his wool-washing.

Department of Public Works, Harbours and Rivers Branch, Sydney, 14 April, 1891.

I BEC to report that all the men employed by this department are working only in widening and embanking Ricketty-street, which is half a mile from this wool-washing establishment; and that no fires are made, not even for boiling water for the men's tea is made, anywhere near these works.

I think this application refers to a party of men employed under contract by the Sewerage Department.

To the Engineer-in-Chief.

ALFRED WILLIAMS.

Forwarded for information. The matter herein referred to apparently comes under the Roads Branch.—C.W.D., B.C., 14/4/91. Under Secretary. Mr. Hickson.—D.C.McL. (per U.S.), B.C., 16/4/91. Urgent. Mr. Bagge.—R.R.P.H., 17/4/91. Report herewith.—J.D., 20/4/91.

No. 8.

## No. 8.

## Report by Resident Engineer Boys.

*Re* alleged Damage by Smoke to MacNamara's Wool, at Shea's Creek.

Sir,

Sydney, 19 March, 1891.

In accordance with your instructions, inquiries were made into the burning of rubbish at Shea's Creek Canal.

The contractors for the construction of Munni-street to Shea's Creek storm-water sewer (Contract 72) lit a fire to burn the reeds soon after commencing their contract, on or about March 20th.

The foreman of the wool-washing works came over and requested the burning to be stopped. This was done at once. His yard was full of wool at the time. No damage was done.

The foreman stated at the time to the contractors that there would be no harm done if they lit their fires when the wind blew away from the wool-works, namely, from the west, north-west, and north. Fires were lit since then with wind from specified direction.

On one occasion, about three weeks ago, the wind changed after a fire was lighted, and the fire was put out as quickly as possible, by the contractors' orders.

An accidental fire also occurred about this time—not lighted by the contractors—but was put out by them, the wind at the time being towards the wool-works.

A fire, lit by the Chinese who rent land on the eastern side of canal, to burn weeds, caught some of the reeds, but was put out by the contractors' orders, the wind at this time being towards the wool-works. This happened ten days ago.

I have, &amp;c.,

J. W. T. BOYS.

Forwarded with my report.—J.D., 20/4/91.

## No. 9.

## The Supervising Engineer to The Principal Assistant Engineer for Sewerage.

It appears that the contractors have made fires for burning the weed that had to be cleared from the swamp along the storm-water channel on the proposed line of Shea's Creek canal, but care seems to have been taken by the contractors that the weed should only be burnt when the wind would blow the smoke away from Mr. McNamara's works.

If Mr. McNamara has sustained any damage from the fires lighted by our contractors, they, according to the third paragraph of Section 11 of General Conditions, are liable.

I intend seeing Mr. McNamara with the contractors, but in the meantime I recommend that the contractors should be instructed, in future, not to burn the weed referred to.

J. DAVIS.

Submitted.—F.O.P., 20/4/91.

For the information of the Engineer-in-Chief, Mr. Davis's suggestion at end of his report seems necessary to avoid further trouble. I think contractor should have asked permission to burn weeds, &amp;c., before he commenced it, as the specification only provides for the removal of all rubbish, &amp;c.—C. H. OHLFSEN-BAGGE, 20/4/91. Engineer-in-Chief.

Inform contractor, and to resubmit after seeing Mr. McNamara.—R. R. P. H., 20/4/91. Contractors informed, and Mr. McNamara asked to see me on Wednesday morning at 10'30.—J.D., 20/4/91. Further report herewith.—J.D., 1/5/91.

## No. 10.

## Messrs. Carter &amp; Co. to The Supervising Engineer for Sewerage.

Sir,

St. John's Road, Glebe, 29 April, 1891.

We have the honor to acknowledge the receipt of your letter of 23th April, *re* damage caused by fires at Shea's Creek, Contract No. 72, and in reply to state that we recognise no liability in the matter.

We have, &amp;c.,

CARTER &amp; CO.

This letter is in reply to one I addressed to contractors informing them that Mr. McNamara assessed his damage at £200, and asking them if they would be willing to pay that amount in order to settle the matter.—J.D., 30/4/91. Mr. Bagge.

## No. 11.

## The Supervising Engineer to The Principal Assistant Engineer for Sewerage.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 16 May, 1891.

MINUTE-PAPER.

*Subject* :—Contract No. 72. Munni-street to Shea's Creek Stormwater Sewer. Arrangement for carrying sewer through Mr. W. C. Cooper's land.

WHEN Mr. Hill gave permission for the sewer to be constructed through Mr. W. C. Cooper's land at Alexandria, without the land being resumed, he stipulated that :—

1. Stop-boards, &c., were to be provided for turning the Macdonaldtown Creek to M'Namara's wool-washing establishment.
2. A flume over the new channel was to be constructed, so that the water flowing in the Alexandria Creek should, as at present, flow to McNamara's wool-washing establishment.
3. A portion of the channel, 2½ chains long, passing through a sandhill, should be covered.

The extra expense that this work will necessitate is estimated to cost £609 1s. 10d.

The Engineer-in-Chief's approval is required for this amount to be spent.

J. DAVIS,

16/5/91.

Mr. Bagge.

The conditions herein described and stipulated by Mr. Hill were, in fact, originally intended to be included in the contract, but were afterwards omitted when it was intended for the present to leave out the outlet end. This, however, was afterwards found to be impracticable; the outlet end had to be built first, and hence the items of works described by Mr. Davis have now become necessary, and a proportionate length of the inlet end of sewer will have to be built at some future time to meet the present unavoidable expenditure of the £609 1s. 10d.—C. H. OHLFSEN BAGGE, 18/5/91. Engineer-in-Chief.

Recommended. The £600 is not, strictly speaking, an extra, as if the land had to be resumed the cost would have been more.—R.H., 27/5/91. List.—J.P., 27/5/91. Approved by Minister, Order No. 1843.—D.C. McL., 5/6/91. Roads.—J.B., B.C., 6/6/91. Messrs. Bagge and Davis to see.—F.O.P., 8/6/91. Seen.—R.H., 8/6/91. Seen.—J.D., 9/6/91. Seen.—C.H.O.B., 9/6/91.

## No. 12.

## The Supervising Engineer to The Principal Assistant Engineer for Sewerage.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 11 June, 1891.

MINUTE-PAPER.

*Subject* :—Contract No. 72. Munni-street to Shea's Creek Stormwater Sewer. Quantity of earth washed into finished open channel.

DURING the heavy rain on Monday night last a large quantity of earth from the swamp above our works was washed into the earth open channel which has been excavated along the line of the proposed Shea's Creek Canal. This has been caused, I have no doubt, not by the ordinary flow of water across the swamp, but by the woolwashers, who have dams across the creek, above our works, opening their sluices, and as, it appears, the sluices are all opened at the same time, a very large quantity

quantity of water rushes across the swamp into our works. The woolwashers have been seen with a view of getting them to allow the water to escape gradually, but they state that when rain comes on, as they have no overflows, they are obliged to open the sluices.

The contractors had finished the excavation of the open channel on the line of the canal.

I am of opinion that it will be best to allow the channel to remain in its present condition until the swamp has had time to thoroughly drain.

Mr. Bagge.

J. DAVIS.

It would be unfair for us to ask the contractor to clean this debris and sediment collected in the various wool-wash dams away after every heavy rain. I believe now that we should finish our storm-water channel which, during very rainy weather, will carry sufficient water to scour the northern channel and form its own outlet now.—C. H. OHLFSEN BAGGE, 11/6/91. Engineer-in-Chief.

Appd.—Resubmit when contract is completed, unless in the meanwhile there seems a probability of the channel filling up.—R.H., 19/6/91. Messrs. Bagge and Davis to note.—F.C.P., 19/6/91. Noted.—J.D., 19/6/91. Saw Engineer-in-Chief, and he thinks that this matter stand over for the present.—J.D., 25/1/92.

No. 13.

The Supervising Engineer for Sewerage to Resident Engineer Boys.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 26 June, 1891.

MINUTE PAPER.

Subject:—Contract No. 72. Filling in and surplus material.

THE contract provides that all abandoned open channel shall be filled in, and that any excavation which is not occupied with permanent works shall also be filled in, and that the price for filling in shall include the carting away and depositing surplus material. Unless it is distinctly understood what filling we require done into abandoned open channel there may be some dispute afterwards when we have to make the final measurement, and I, therefore, wish Mr. Boys to give directions in each case where he requires such filling done; and before the filling is put in hand to take cross-sections if they have not already been taken of the parts to be filled in.

Mr. Boys.

J. DAVIS.

Noted.—J.W.T.B., 26/6/91. This might be put aside for the present.—J.D., 27/6/91. Mr. Piper.

No. 14.

B. C. Simpson, Esq., to The Engineer-in-Chief for Sewerage.

113 Phillip-street, Sydney, N.S.W., 19 October, 1891.

My dear Sir,

I have been consulted by Messrs. Carter & Co. respecting their claim for compensation on account of the cancellation of that portion of sewerage contract No. 72 between 41'30 chains and 76'58 chains.

They state that the portion of the contract executed is the most difficult portion, and the least remunerative to them, and that the large section of the work now withdrawn is that on which they calculated on making their profit from this work, and that moreover they have already entered into contracts for the supply of the material.

I have examined the specification and conditions of contract, and it appears to me that clause 3 of the former empowering the engineer to make any reduction in the length of the sewer that he may consider necessary, could not be held to authorise the cancellation without compensation of so large a portion of the contract after materials have been ordered, but must be held to refer to such alterations of the work as may be considered necessary for its greater efficiency, and to protect the department from captious claims on account of minor works omitted on account of alteration of design.

As it appears to me that the extent and the time of the cancellation must very materially enter into the equitable reading of these clauses of the contract, I have advised Messrs. Carter & Co. that, in my opinion, they have in this case an equitable and legal right to compensation.

I shall, however, be very glad to call upon you and discuss this matter, and do what I can to effect a settlement satisfactorily to you and to them, if you will kindly make an appointment for this purpose.

Yours, &c.,

B. C. SIMPSON.

Appoint Wednesday at 10 a.m.—R.H., 19/10/91.  
postpone till he hears further from me.—R.H., 21/10/91.

Memo. sent.—F.C.P., 19/10/91.  
Memo. sent by Engineer-in-Chief.

Ask Mr. Simpson to

No. 15.

The Council Clerk, Macdonaldtown, to The Minister for Public Works.

Sir,

Council Chambers, 17 November, 1891.

I have the honor, by direction of the Mayor, to draw your attention to the intended stoppage of the construction of the storm-water sewer along Macdonald-street to Munni-street, in this municipality.

This is a most important public work, and one that affects the health of thousands of inhabitants, who will be greatly benefited by the construction of this sewer, which will not only remove the nuisance arising from open drains in this municipality, but will relieve a very large and populous district from being flooded during heavy rains.

Trusting that the necessity for the stoppage of this most important public work may be averted.

I have, &c.,

WILLIAM F. BRAY,

Council Clerk.

The Council Clerk, Newtown, to The Under Secretary for Public Works.

Sir,

Borough of Newtown, Town Hall, 18 November, 1891.

I have been instructed by the Council to bring under the notice of the Hon. the Minister for Public Works, the fact that the storm-water sewer, which was promised to carry on to the foot of Munni street, being the boundary between this borough and Macdonaldtown, has stopped a long way short of this place.

I wish to point out that the great quantity of storm-waters which flow from this borough into the flat portion of Macdonaldtown, has for many years been a great source of trouble and annoyance between the councils, and, some two or three years ago, a deputation from the councils was promised that, as soon as possible, the storm-water sewer should be carried to Munni-street.

Trusting this matter will receive the consideration that the necessities of the case demand.

I have, &c.,

JESSE COWLEY,

Council Clerk.

Commissioner for Roads.—D.C.M'L. (pro U.S.) B.C., 19/11/91. Mr. Bagge.—F.C.P., 20/11/91.

Joseph Abbott, Esq., M.P., to The Minister for Public Works.

The Hon. W. J. Lyne, Esq., Minister for Public Works,—

Parliament House, Sydney, 19 November, 1891.

Dear Sir,

I am requested by the Macdonaldtown Council, within my electorate, to invite your attention to the importance of having the construction of the stormwater sewer along Macdonald-street to Muuni-street completed as soon as practicable. It is reported that there is some intention to suspend the work, but the cause is not stated. If you will have this matter looked into I shall be much obliged.

I am, &c.,

J. ABBOTT.

Mr. Hickson.—D.C.M'L. (pro U.S.), B.C., 20/11/91. Mr. Bagge.—F.C.P., 20/11/91.

No. 16.

## No. 16.

## The Principal Assistant Engineer for Sewerage to the Engineer-in-Chief.

*Subject* :—Extension of the Sheas Creek Storm-water Channel from the Macdonaldtown Park Branch Channel to Munni-street.

THESE three letters (91/2,793, 91/2,802, and 91/2,816) all refer to the same subject, namely, the extension of the Sheas Creek storm-water channel from the Macdonaldtown Park branch channel along Macdonald-street to Munni-street.

I quite agree with the writers that the work is most important, and the question of constructing this extension is now before the Minister [see papers 91/2,424] for the purpose of procuring funds.

C. H. OHLFSEN BAGGE,  
21/11/91.

This matter also refers to Mr. Molesworth's, M.L.A., letter (91/2,896) received to-day.—C.H.O.B., 23/11/91.

See previous papers (91/2,424 and 91/2,819). Forwarded.—U.S., 23/11/91. R.R.P.H.—24/11/91.

## MINUTE PAPER.

*Subject* :—Contract No. 72, Munni-street to Sheas Creek storm-water channel, recommending that the balances of votes available from completed storm-water channels be used to finish Contract No. 72 to Macdonald-street junction.

THE amount of tender for Contract No. 72 was £20,650, but it was accepted conditionally upon the contract being reduced by £3,000.

It is advisable that Contract No. 72 should be continued, so as to give an outlet to Contract No. 75.

|   | £      | s. | d. |
|---|--------|----|----|
| The cost of doing this will be .....            | 18,764 | 4  | 10 |
| Deduct amount paid to date.....                 | 9,680  | 13 | 9  |
| Amount required to finish Contract No. 75 ..... | 9,087  | 11 | 1  |
| Amount available from vote.....                 | 5,754  | 0  | 0  |
| Balance to be provided .....                    | 3,333  | 11 | 1  |

See particulars attached.

I beg to suggest that this amount be paid from the following votes, viz. :—

|   |        |   |   |
|---|--------|---|---|
| There will probably be a balance of £2,000 from the Macdonaldtown storm-water channel vote after that channel has been paid for, which might be used for Contract No. 72, which is part and parcel of the same work ..... | 2,000  | 0 | 0 |
| The following amounts, being balances left from votes from the undermentioned storm-water channels, might also be used for this purpose :—  |        |   |   |
| University storm-water channel .....  | 131    | 0 | 0 |
| Phillip-street, Alexandria, storm-water channel .....   | 815    | 0 | 0 |
| Pymont Bridge Road storm-water channel .....  | 265    | 0 | 0 |
| Alexandria Park storm-water channel .....   | 57     | 0 | 0 |
|   | £3,268 | 0 | 0 |

Mr. Bagge.

J. DAVIS.

## No. 17.

E. W. Molesworth, Esq., M.P., to The Under Secretary for Public Works.

Sir,

18, Loftus-street, Sydney, 20 November, 1891.

I desire to bring under your notice the enclosed communication from the Municipality of Macdonaldtown, in re the completion of the storm-water sewer along Macdonald-street to Munni-street, and to ask that the work may not be suspended, as it would be a great calamity to the district if allowed to remain unfinished.

Yours, &c.,

E. W. MOLESWORTH.

Commissioner for Roads.—D.C.McL. (per U.S.), B.C., 21/11/91.

Sir,

Council Chambers, 17 November, 1891.

I have the honor, by direction of the Mayor, to ask you to be good enough to use your influence with the Honorable the Minister for Works, to induce him to proceed with the construction of the storm-water sewer along Macdonald-street to Munni-street, which has lately been commenced.

It is intended to stop this most important work shortly, and I need hardly point out to you the inconvenience that will be caused to a very large number of the surrounding inhabitants by this work being stopped.

I have written to the Minister for Works, drawing his attention to the matter, and requesting him, if he possibly can, to allow this work to proceed.

Trusting that your efforts in this matter may be attended with success.

I have, &c.,

WILLIAM F. BRAY,  
Council Clerk.

E. W. Molesworth, Esq., M.P., Newtown.

## No. 18.

B. C. Simpson, Esq., to The Engineer-in-Chief for Sewerage.

My dear Sir,

113, Phillip-street, Sydney, N.S.W., 10 December, 1891.

Messrs. Carter & Co. have again seen me respecting their claims for compensation on account of the withdrawal of the most profitable portion of their sewerage contract No. 72, concerning which claims I wrote to you on the 19th October.

Mr. Piper, of your department, called on me on the 3rd ultimo, and stated that you agreed with him as to the contractors' right to complete their contract, but pending this completion, Messrs. Carter & Co. allege that they are being put to continued expense, and desire that a settlement of the question should be arrived at. They appear to want only what is fair, which I am quite sure you will be willing to give them, and I shall be pleased if I can assist in a satisfactory settlement. I shall be glad to call on you at any time that will be convenient to you.

Your, &c.,

B. C. SIMPSON.

Ask Mr. Simpson to call on Monday at 11 a.m.—R.R.P.H., 11/12/91. Mr. Piper. B. C. Simpson, Esq., 11/12/91.

## No. 19.

The Supervising Engineer to The Principal Assistant Engineer for Sewerage.

THE £100 overtime penalty referred to by the contractors was deducted in the usual way from the progress return made on the 30th November.

The contractors undertook to execute £20,650 (the amount of their tender) of work in eight months. At the time of the last progress return the amount of the work executed was £18,045 19s. 1d., so that the contractors had not completed work to the amount of their tender by £2,604 0s. 11d. I consider, therefore, that to deduct the time penalties is only conforming to the terms of the contract.

I recommend that the contractors be informed the time penalties will be deducted, in accordance with the terms of the contract, and that at the completion of the work ordered to be executed the matter will be further considered.

J. DAVIS.

Let me see previous papers.—R.R.P.H., 4/1/92. 91-3,024 herewith; 91-2,819 to Under Secretary, 23/11/91; and 91-2,826 to Under Secretary, 24/11/91. Papers now attached.—F.C.P., 5/1/92. For the consideration of the Engineer-in-Chief.—C. H. OHLFSEN BAGGE, 4/1/92. Approved.—R.R.P.H., 5/1/92. Carter & Co., 6/1/92.

Sewerage Contract No. 72 (Shea's Creek).

Sir,

St. John's Road, Glebe, 22 December, 1891.  
We have the honor to inform you that the sum of £100 has been deducted from progress payment No. 8 in this work, as penalty for alleged non-completion of contract within contract time; and to notify you that the payment of £965 1s. 3d. is accepted by us under protest, we not admitting our liability to any such penalty.

We desire to again bring under your notice that the proposed withdrawal of the most profitable part of our contract will cause us loss and inconvenience, besides the loss of profit thereon, for which we consider we have a legal and equitable right to compensation; and, moreover, that this withdrawal, and the delay in laying out the upper portion of the work to the original point of termination of our contract, have caused us to work at a disadvantage from the lower end only, thereby causing the delay for which the penalty of £100 has now been deducted.

We have, therefore, the honor to submit that under these circumstances this deduction is a breach of the conditions of our contract, and to request that you will be good enough to authorise the supplementary payment of the £100 in question.

R. Hickson, Esq., Engineer-in-Chief for Sewerage, Sydney.

We, are, &c.,  
CARTER & CO.

For report.—R.R.P.H., 23/12/91. Mr. Davis.—C.H.O.B., 23/12/91. Report herewith.—J.D., 4/1/91.

## No. 20.

The Supervising Engineer to The Principal Assistant Engineer for Sewerage.

MINUTE PAPER.

Subject:—Contract No. 72, stop-board for open channel at M'Namara's woolwashing establishment.

Department of Public Works, Roads and Bridges and Sewerage Branch,  
Sydney, 11 January, 1892.

THE contractors have offered to provide a stop-board as shown on supplemental drawing for use in this storm-water channel for the following:—

|                                     |   |          |
|-------------------------------------|---|----------|
| Oregon, 41·47 cubic feet, 10s. .... | = | £20 15 0 |
| Ironwork at schedule rates .....    | = | 2 16 1   |
|                                     |   | £23 11 1 |

I consider that 10s. per cubic feet for worked Oregon is far too much, and I would recommend that the timber be ordered, and that our carpenter do the work. If this is done the cost will be under 4s. per cubic feet.

J. DAVIS.

For the approval of the Engineer-in-Chief.—C. H. OHLFSEN BAGGE, 11/1/92. Approved.—R.R.P.H., 11/1/92.  
Noted.—J.D., 11/1/92.

## No. 21.

Minute by The Under Secretary for Public Works.

Shea's Creek Canal.

MR. WILLIAMSON has called here to complain on behalf of Mr. M'Namara, that we are working beyond the limit laid down in the Supreme Court Injunction in connection with the above work, whereby all the water supply to the woolwashing establishment has been run off, thereby inflicting serious damage to his client. I can hardly think this can be the case. Does Mr. Darley know anything about it, certainly no orders have been given by the minute? Very urgent.

J. B., 6/1/92.

I can state that no man working for this branch has interfered in any way with the water-courses, or the land, above the line marked out as a limit for the works connected with the Shea's Creek Canal.—ALFRED WILLIAMS, 7/1/92. Seen. Forwarded for information.—A. DARLEY, 8/1/92. B.C., Under Secretary, Public Works. Mr. Williams for report E-in-C. Jno.—P., 8/1/92. J.B. Mr. Hickson. How does the matter now stand? I think the whole affair has been clearly explained, it was sewerage work.—J.B., 9/1/92. Let me have papers in connection with this matter.—R.R.P.H., 12/1/92. Papers 91/1286 herewith.—F.C.P., 12/1/92. The accompanying correspondence will show that full authority was given by the landlord, through his agent Mr. Hill, to carry out this work in a certain manner, which has been done, any claim M'Namara may have seems therefore to be against his landlord.—R.R.P.H., 12/1/92.

## No. 22.

The Council Clerk, Alexandria, to The Supervising Engineer for Sewerage.

Sir,

Town Hall, Borough of Alexandria, 15 January, 1892.  
It having been intimated to this Council that it is intended to block the eastern end of Munni-street storm-water sewer, traversing through Macdonaldtown Park, and discharging into Shea's Creek, for the purpose of diverting that water to Mr. H. M'Namara's woolscouring works, if such is the fact this Council protests against such a course being adopted, as it will cause an accumulation of stagnant water in that open sewer, thereby giving forth an effluvia which will be detrimental to the health of a large body of people living adjacent thereto.

I remain, &c.,  
M. J. MADDEN,  
Council Clerk.

Seen.—R.R.P.H., 16/1/92.

Ack., 18/1/92.

## No. 23.

Messrs. Williamson and Williamson to The Secretary for Public Works.

Temple Court, King-street, Sydney, 13 January, 1892.

The Honorable W. J. Lyne, Minister for Works, Sydney,—

Sir,

On the 30th of April last Mr. Henry M'Namara obtained an injunction in the Supreme Court against Mr. Bruce Smith, then Minister for Works, restraining the department from interfering with the water supply to our client's woolwashing establishment. Since then your officers have cut a trench to the north of the dam, with the result that the subterranean water supply has been diverted, and the dam emptied. The rain during the last few days has slightly filled it, but towards the end of the present week it is anticipated our client will have to cease operations.

Considering that Mr. M'Namara is killing 10,000 sheep every week, the loss in wool and basils is of no small amount, as there is no possibility of continuing work there, our client is agreeable to refer the question of compensation to arbitration, which would not occupy more than two days.

Would you kindly give the matter your immediate attention, as every day's delay is of consequence to Mr. M'Namara.

We have, &c.,  
WILLIAMSON and WILLIAMSON.

Mr. Hickson.—D.C.McL. (per U.S.), B.C., 14/1/92. Received by me, 19/1/92. See previous papers, 92/42, sent Works, 13 Jan., 1892.—R.R.P.H., 19/1/92. Under Sec. Submitted.—J.B., 19/1/92. Resubmit when we hear further.—11/2/92.

No. 24.



## No. 24.

B. C. Simpson, Esq., to The Under Secretary for Public Works.

Dear Mr. Barling,

113, Phillip-street, Sydney, N.S.W., 25 January, 1892.  
 You will remember my speaking to you respecting Messrs. Carter & Co.'s contract (Shea's Creek sewerage). They have, I hear, seen Mr. Hickson this morning, and he has suggested their talking some matters over with the Minister, in the hope of coming to a settlement. Will you kindly get them an interview?

Yours, &c.,  
 B. C. SIMPSON.

Seen; put with the papers.—J.B., 25/1/92.

## No. 25.

The Council Clerk, Macdonaldtown, to The Under Secretary for Public Works.

Sir,

Council Chambers, Macdonaldtown, 24 February, 1892.

I have the honor, by direction of the Mayor, to ask you to be good enough to inform me if the Hon. the Minister for Works will be pleased to receive a deputation from this Council on the subject of the stoppage of the construction of the storm-water sewer along Macdonald-street to Munni-street.

Trusting that the Council's application will be favourably received.

I have, &c.,  
 WILLIAM F. BRAY,  
 Council Clerk.

May perhaps be informed that there is no need for a deputation, and that as soon as the additional money required is voted the work will be proceeded with.—J.B., 25/2/92. Approved.—W.J.L., 5/3/92. Information sent these Members.—J.B., 5/3/92. F. Cotton, T. Hindle, J. Abbott, E. W. Molesworth, Esqs., Ms.P., 12/3/92. Seen.—R.R.P.H., 14/3/92.

## No. 26.

Joseph Abbott, Esq., M.P., to The Secretary for Public Works.

My dear Mr. Lyne,

Parliament House, Sydney, 22 February, 1892.

Some time since I brought under your notice the urgent necessity there was for proceeding with storm-water sewer along Munni-street to Macdonaldtown, and under date of 20th November you promised to get a report and advise me further, since which time I have had no communication on the matter. If you will cause inquiry to be made I think you will find the matter one of urgency. Relying upon your good offices.

I am, &c.,  
 J. ABBOTT.

Informed as directed.—J.B., 23/2/92. Has this been done? Seen.—R.R.P.H., 26/2/92. Under Secretary. Attach copy of our letter.—D.C.McL., 29/2/92. Mr. Holliman. Copy herewith.—3/3/92. Mr. Hickson. Seen.—R.R.P.H., 5/3/92. Munni-street papers herewith.—5/4/92.

Dear Mr. Abbott,

23 February, 1892.

The sum required to finish the Munni-street storm-water sewer will be placed on the Estimates, but Mr. Lyne desires me to say that he will not be able to deal with the matter until they are passed, which will, however, I presume, be now in a short time.

Joseph Abbott, Esq., M.P.

Yours, &c.,  
 J. BARLING.

## No. 27.

Messrs. Carter &amp; Co. to The Under Secretary for Public Works.

Sir,

St. John's Road, Glebe, 26 February, 1892.

With reference to our interview with you this morning, in connection with Contract No. 79, main outfall sewer, North Shore, we do ourselves the honor to notify you that in consideration of our tender for the same being accepted we are willing, and hereby agree, to forego all claims for compensation on our Contract No. 72, Munni-street storm-water channel, Alexandria.

We are, &c.,  
 CARTER & CO.

Mr. Norrie to prepare the bond at once. Mr. Hickson will explain.—J.B., 25/2/92. Bond for Contract No. 72 herewith.—F.C.P., 29/2/92. Mr. Norrie.

## No. 28.

## Minute.

Contract No. 72, Sydney Sewerage, Munni-street, Redfern.—Carter &amp; Co., contractors.

Public Works Department, Sydney, 29 February, 1892.

THE Bank fixed deposit receipt for £900, lodged in connection with the above contract, will mature on the 10th proximo. Should it be renewed?

The Commissioner for Roads. B.C., 29/9/92.

D.C.McL. (*pro* U.S.)

Mr. Davis.—F.C.P., 1/3/92.

## No. 29.

The Supervising Engineer to The Principal Assistant Engineer for Sewerage.

THE work on this contract has been satisfactorily finished, and the measurements made by the branch have been accepted by the contractor, so that now there is no matter in dispute. If the fixed deposit be returned there will still remain in the hands of the department the retention money and lump sum for maintenance, amounting to £950 12s. 9d., until the period of maintenance expires.

I recommend that the contractors' request be granted.

J. DAVIS.

Recommended.—R.R.P.H., 2/3/92. Under Secretary. List.—D.C.McL. (*pro* U.S.), 3/3/92. Approved by Minister, Order No. 794.—D.C.McL., 7/3/92. J.B. Return deposit.—J.B., 8/3/92. Messrs. Carter & Co. to call.—8/3/92. Received security referred to herein.—CARTER & Co., 10/3/92. Roads.—D.C.McL. (*pro* U.S.), B.C., 10/3/92.

## No. 30.

The Council Clerk, Alexandria, to The Supervising Engineer for Sewerage.

Memorandum.

Sir,

2 March, 1892.

I am directed by resolution of Council to call your attention to the fact that a settlement has taken place in the storm-water sewer which crosses Mitchell Road at Sparkes' Bridge of about 2 feet; and this settlement is filled by offensive matter, which requires to be removed. Your kind attention to this matter will greatly oblige.

I am, &c.,  
 M. J. MADDEN,  
 Council Clerk.

Will Mr. Boys please get this attended to at once, and report.—J.D., 3/3/92. Mr. Boys. Council Clerk informed the matter will receive immediate attention.—J.D., 3/3/92. The contractors will attend to this on 7th March, 1892.—J.W.T.B., 4/3/92. Mr. Wagg to report when done.—J.D., 4/3/92. No settlement whatever has taken place, nor have any holes been filled in with offensive matter on any part of the works. The Council's inspector informed me that it must be an error on the part of Council Clerk.—GEO. WAGG, 7/3/92. Council Clerk informed.—J.D., 8/3/92.

## No. 31.

Messrs. Carter &amp; Co. to The Engineer-in-Chief for Sewerage.

Contract No. 72 (Shea's Creek).

Sir,

Alfred-street, North Sydney, 25 March, 1892.

We have the honor to ask you to be good enough to remit the time penalties imposed on the above contract. Our reasons for asking this are: That additional work, viz., the cutting of half a mile of canal at commencement of contract, was ordered and executed; and that during nearly the whole progress of the work exceptionally wet weather prevailed, which considerably impeded operations. Trusting this may meet your favourable consideration,

We are, &c.,  
CARTER & CO.

I think there will be no necessity to take any action on this letter. Since the date of it the Minister has approved of Messrs. Carter & Co. completing the work to Munni-street, and the time for the completion of the contract has been extended to the 18th of August next.—J.D., 30/5/92. Engineer-in-Chief. I concur.—R.R.P.H., 1/6/92.

## No. 32.

Agreement.

MINUTE PAPER.

*Subject:—Re Extension of Time, Munni-street Sewer, Contract No. 72.*

Department of Public Works, Bonds and Contract Branch, Sydney, 28 May, 1892.

THE memo. of agreement herein duly prepared has been executed by the Honorable the Minister and the contractors, Messrs. Carter & Co., and stamped, and may now be forwarded to the Commissioner and Engineer-in-Chief for Sewerage. The tender and all other papers herein are sent herewith.

H. F. NORRIE,  
Officer-in-charge (*pro* V.C.L.)

## MEMORANDUM OF AGREEMENT.

MADE this 19th day of April, in the year of our Lord 1892, between the Honorable William John Lyne, the Minister for Public Works, in and for the Colony of New South Wales (hereinafter referred to as "the said Minister"), of the one part, and John Carter, David Graham Snodgrass, and George Forrest, of North Sydney, in the said Colony, contractors, carrying on business together under the name, style, or firm of "Carter & Co." (and hereinafter referred to as "the said contractors"). Whereas by a certain agreement in writing, bearing date the 16th day of March, 1891, the said contractors covenanted with Her Majesty the Queen, her heirs or successors, to find and provide all the materials, tools, plant, labour, and every other thing requisite and necessary for, and performance of, the various works required in and about the full and proper construction, erection, and completion of Munni-street, Macdonald-street, Mitchell Road to Shea's Creek storm-water channel, known as Contract No. 72, Sydney and Suburbs Storm-water Drainage, in accordance in all things with the printed notice, tender, specification, general conditions, and special conditions thereunto annexed, and the plans or drawings relating thereto, and therein referred to, and to complete and finish the whole of the said works on or before the 28th day of October, 1891. And whereas the said works are still unfinished and not completed, and the said contractors have applied to and requested the said Minister to extend the time for the completion of the said works until the 18th day of August, 1892, which the said Minister hath consented to do. Now these presents witnesseth, that in consideration of the premises the said Minister, acting on behalf of the Government of the said Colony, doth hereby extend the time for completion of the works in the said agreement, tender, specification, general conditions, and special conditions, mentioned or referred to, until the 18th day of August, 1892, and that the said contractors do hereby jointly and severally covenant, promise, and agree with the said Minister that they, the said contractors, shall, and will, well and truly complete the whole of the works mentioned in the specification, general conditions, and special conditions, and the plans or drawings therein referred to, mentioned, or shown, in accordance in all things with the said tender, specification, general conditions, special conditions, and plans or drawings, on or before the 18th day of August, 1892; and further, that at all times hereafter the said agreement shall be read and considered as if the said 18th day of August, 1892, had been named in and by the said agreement, tender, specification, general conditions, and special conditions, as the day on or before which the said works were to be completed and finished by the said contractors; and that the said agreement shall not be considered as altered, or the stipulations, provisoes, and agreements therein or in the said specification, general conditions, and special conditions, in any way barred, waived, or departed from in any respect, other than as to the time within which the said works are to be completed, but that Her Majesty the Queen, her heirs and successors, the said Minister and his successors in office, and the Government of the said Colony, shall have all and every the rights, powers, and authorities, cause and causes of action, and suits, claims, and demands, given to or vested in her, or them, in and by the said agreement, tender, specification, general conditions, and special conditions in all respects against the said contractors, and each and every of them, as if the said 18th day of August, 1892, had been the day or time originally named in and appointed for the completion of the said works; and that all and singular the penalties, forfeitures, sum or sums of money, rights, and privileges which would accrue to, or vest in Her said Majesty the Queen, her heirs or successors, the said Minister and his successors in office, or the Government of the said Colony, for or by reason, or on account of the said works not being completed and finished within the time named, and according to the said tender, specification, general conditions, special conditions, and the said agreement shall accrue to, or vest in Her said Majesty, her heirs or successors, the said Minister and his successors in office, or the Government of the said Colony, if the said works shall not be completed and finished in all things on or before the 18th day of August, 1892; and that the said agreement shall at all times be read and considered as if the said 18th day of August, 1892, was, and is, the time therein named for the completion of the said works, instead of the said 28th day of October, 1891; and, lastly, that in consideration of such extension of time, as aforesaid, the said contractors shall not have any claim or demand against the Crown, or the Colonial Government, or the said Minister, for any alleged failure or delay on the part of the said Government in not setting out the said works, or furnishing plans or detailed drawings, or in not supplying machinery or materials, or otherwise arising out of any supposed failure, neglect, or default on the part of the said Government; and all such claims and demands are hereby expressly waived and surrendered. In witness whereof the said parties to these presents have hereunto set their hands and seals the day and year first before written.

Signed, sealed, and delivered by the said William John Lyne, the Minister }  
for Public Works in and for the Colony of New South Wales, but not }  
so as to incur or come under any personal liability in respect of the }  
premises, in the presence of,—

J. BARLING.

WILLIAM JOHN LYNE.

Signed, sealed, and delivered by the said John Carter, in the presence of,—

HAROLD F. NORRIE, J.P.

JOHN CARTER.

Signed, sealed, and delivered by the said David Graham Snodgrass, in the }  
presence of,—

V. C. LUMSDAINE.

D. G. SNODGRASS.

Signed, sealed, and delivered by the said George Forrest, in the presence }  
of,—

HAROLD F. NORRIE.

GEO. FORREST.

Contract

Contract No. 72.—Munni-street Storm-water Sewer.

Sir,

Box No. 10, North Sydney Post Office, 30 May, 1892.

We have the honor to ask you to be good enough to refund to us a sum of five hundred pounds (£500) of the retention money held by you on the above contract.

The total retention money amounts to nine hundred pounds (£900), and as the work is approaching completion we trust that you will see fit to grant our request.

J. Davis, Esq., Sewerage Department.

We are, &c.,  
CARTER & CO.

Report herewith.—J.D., 1/6/92.

## No. 33.

The Supervising Engineer to The Principal Assistant Engineer for Sewerage.

## MINUTE PAPER.

*Subject*.—Contract No. 72.—Munni-street Storm-water Channel—Recommending that £500 retention money be returned. Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 1 June, 1892.

WHEN the Minister approved of Messrs. Carter & Co. completing this storm-water sewer they had completed the lower portion of the work, and maintained it for three months, in accordance with the contract, with the exception of some slight repairs to the rendering. The value of this completed work is £18,605 3s. 5d., and the amount retained of it is £930 5s. 2d. The contractors ask that £500 of this sum be returned pending the execution of the upper portion of the channel to Munni-street. I do not see any objection to the request of the contractors being complied with, as we have £212 17s. 6d., which has been retained on the upper portion, in addition to the £930 5s. 2d. mentioned above, making a total in the hands of the department of £1,143 2s. 8d.

J. DAVIS.

Mr. Davis to see me with present and previous vouchers.—R.R.P.H., 1/6/92. Progress returns herewith.—F.C.P., 2/6/92. Recommended. If the extension of this contract (£7,000) had not been gone on with contractors, would have been entitled to the return of the whole of the retention money.—R.R.P.H., 3/6/92. Under Secretary. Submitted.—J.B., 4/6/92. Approved.—W.J.L., 6/6/92. Roads.—D.C.McL. (*pro* U.S.), 6/6/92. Noted.—R.R.P.H., 7/6/92. Inform contractors, and then to Mr. Davis for voucher.—F.C.P., 8/6/92. Carter & Co., 8/6/92. Voucher herewith.—J.D., B.C., 10/6/92.

## No. 34.

The Supervising Engineer to The Principal Assistant Engineer for Sewerage.

## MINUTE PAPER.

*Subject*.—Contracts Nos. 72 and 75, Shea's Creek Sewer—Further with reference to repairing rendering in invert of sewer which was washed away in March last.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 8 September, 1892.

WHEN the sewer was finished from the eastern boundary of the Macdonaldtown Park to the open concrete channel below Mitchell Road, a length of about 44 chains, the stormwater had to be turned through before the rendering in the invert of the sewer had been allowed time to harden. It was absolutely imperative that the water should be turned in when it was, because, in consequence of the flood water not having a proper channel, properties were being damaged. Through this large quantities of the rendering were washed away, and before the work can be considered perfect, or in such a state that it can be taken over from the contractor, the invert must be repaired.

I saw Mr. Snodgrass (Messrs. Carter & Co.) and Mr. Farley (Messrs. Parry and Farley) this morning, on the ground. They appear to think that there will be considerable difficulty in keeping the water off the invert of the sewer a sufficient length of time to admit of the rendering hardening so as to resist the wash of the water. With this I agree.

In order to get over this difficulty they propose that 18 inches of the sandstone concrete be cut away along the invert of the sewer, and brickwork be substituted. The contractors, I understand, are willing to turn the water out of the sewer to enable them to effect the repairs, cut out the concrete, and substitute brickwork, provided they are paid for the brickwork at their schedule rates. This would make the extra cost as follows, viz. :—

|   | £    | s. | d. |
|---|------|----|----|
| Messrs. Carter & Co., 17 cubic yards, at 80s. ....    | 68   | 0  | 0  |
| Messrs Parry and Farley, 23 cubic yards, at 61s. .... | 70   | 3  | 0  |
|   | £138 | 3  | 0  |

Considering that the contractors were obliged to use the sewer before it was properly finished, and as a consequence the repairs are necessary, and that the brickwork would make a more durable job than the sandstone concrete and rendering it is proposed to renew, I would recommend that the proposals made by the contractors, Messrs Carter & Co. and Messrs. Parry and Farley, be approved.

J. DAVIS.

When once storm water and household water has passed for a time over concrete work, rendering will not bond with concrete, hence the bricklining would certainly be the best and only remedy. I, therefore, recommend Mr. Davis' proposition to the favourable consideration of the Engineer-in-Chief.—C. H. OHLFSEN BAGGE, 9/9/92. The Engineer-in-Chief. Appd.—R.R.P.H., 9/9/92. Messrs. Carter & Co. and Messrs. Parry and Farley informed.—J.D., 10/9/92.

This work has now been finished, and vouchers are being prepared, but in the case of Parry and Farley, I understand that Mr. Farley waited upon the Engineer-in-Chief and pointed out that their price for brickwork was only 61s. per cubic yard, against 80s. paid to Carter & Co., and asking that they be paid at the same rate as Carter & Co. Will the Engineer-in-Chief please say whether Parry and Farley's brickwork is to be paid at 61s., their schedule rate, or 80s., Messrs. Carter & Co.'s schedule rate?—J.D., 28/11/92.

As the schedule rate (61s.) is a low price, and the repairing referred to in the within minute is something beyond the ordinary brickwork, as it includes excavating some of the cement work, I approve of the schedule rate for this special item being increased by 25 per cent.—R.R.P.H., 28/11/92.

Mr. Weedon to include in voucher.—J.D., 28/11/92.

## No. 35.

Messrs. Carter &amp; Co. to The Supervising Engineer for Sewerage.

Contract No. 72, Shea's Creek Sewerage.—Iron Gratings for Gully Shafts.

Sir,

Box No. 10, North Sydney, 1 November, 1892.

Eleven of the above gratings remain on our hands after completing our contract.

These were ordered as per the original schedule quantity,

From various causes, such as alterations in the design, &amp;c., a fewer number than this quantity was required.

Seeing that these can be used on other of your contracts, and are of no use to us, we would be glad to dispose of them to your department at less than cost price to us (say), £2 10s. each, delivered in good order and condition to your dépôt at Camperdown.

We are, &c.,  
CARTER & CO.

There were thirty-two of these gratings given in the schedule as the probable number required, but only fifteen were used. It appears the contractors procured eleven more than were used. The schedule rate for providing and fixing is £4 10s.; but they offer to deliver to Camperdown store for £2 10s. The price being paid to Messrs. Hoskins for the supply and delivery of the same article is £2 10s., and I think, therefore, considering we shall have to cart the gratings from Camperdown to the contract where they may be required, we could not afford to pay more than 45s. I recommend that the eleven gully gratings be taken over at this price.—J.D., 2/11/92. Mr. Bagge. These

These gratings are frequently required on the works, and might, I think, be safely taken from the contractors. The price (45s.) is very low.—C. H. OHLFSEN-BAGGE, 3/11/92. Engineer-in-Chief. Will we require these gratings? If so, why should we take them at less than their value?—R.R.P.H., 3/11/92.

We shall require the gratings. We can get gratings delivered where they are required for 50s., and to allow for the cost of carting these from Camperdown store, I am proposing to give Carter & Co. 45s. each.—J.D., 7/11/92. Engineer-in-Chief. Approved.—R.R.P.H., 7/11/92. Carter & Co., 8/11/92.

Gentlemen,

8 November, 1892.

In reply to your letter of the 1st instant, offering to sell to the Government eleven gully gratings which remain in your hands after completing Contract No. 72, at (say) £2 10s. each, I have the honor to inform you that I am willing to take the gratings over from you at £2 5s. each, delivered in good order and condition at the depôt at Susan-street, Camperdown.

I have, &c.,

ROBT. HICKSON,

Engineer-in-Chief for Sewerage.

Messrs. Carter & Co., Contractors for Contract No. 72.

No. 36.

Messrs. Carter & Co. to The Supervising Engineer for Sewerage.

Contract No. 72, Shea's Creek Stormwater.

Sir,

Box No. 10, North Sydney, 12 November, 1892.

On our last progress certificate for the above contract the sum of £100 has been deducted for five weeks time penalty.

As the time allowed (four months) for the completion of this work was extremely limited, and seeing that the contract was carried out as expeditiously as possible, to which your supervising officers can testify, we respectfully ask you to be good enough to remit the said penalty.

We are, &c.,

CARTER & CO.

No. 37.

The Crown Solicitor to The Under Secretary for Public Works.

MACNAMARA v. SMITH.

Sir,

Crown Solicitor's Office, Sydney, 1 March, 1894.

As it now appears that the land on which the works are proposed to be carried on has not yet been resumed, and as the works cannot be carried on until the resumption is made, I have granted the plaintiff a postponement for a fortnight, as by that time the resumption will be completed, and the Government will be in a better position to have the injunction dissolved.

Please let me have a copy of the *Gazette* Notice of Resumption as soon as it is issued, as I think it would be advisable to have same before the Court on the application.

I have, &c.,

ERNEST A. SMITH,

Crown Solicitor.

I regret that the Crown Solicitor agreed to a postponement for a fortnight, as it causes great inconvenience, and upsets many arrangements in connection with this department.—W.J.L., 2/3/94. I explained to the Minister that this arose on account of the Crown Solicitor not having been informed, as he should have been, of the fact of the land not having been resumed. We are making arrangements to have this done early next week.—J.B., 3/3/94. Re-submit.

MACNAMARA v. SMITH.

Sir,

Crown Solicitor's Office, Sydney, 28 February, 1894.

In answer to your telephone message of this morning, I think it would be unwise to give any undertaking of any kind as a condition for obtaining the consent of Macnamara to the dissolution of the injunction.

The injunction was obtained before the resumption, and now that the *Gazette* Notice has issued, it is quite clear that the constructing authority has full power under the Act to construct these works.

The injunction, in my opinion, ought to be dissolved absolutely.

I have, &c.,

ERNEST A. SMITH,

Crown Solicitor.

The Under Secretary, Department of Public Works.

Submitted.—J.B., 1/3/94.

No. 38.

The Crown Solicitor to The Under Secretary for Public Works.

MACNAMARA v. SMITH.

Sir,

Crown Solicitor's Office, Sydney, 20 March, 1894.

I have the honor to report that the motion to dissolve the injunction granted herein came before His Honor Mr. Justice Owen yesterday and to-day, and after hearing argument His Honor dissolved the injunction, the Minister, by his Counsel, submitting to pay any damages that may be assessed in respect of any injury done to the plaintiff by the works at Shea's Creek previously to the resumption of the land in the *Gazette* on the 6th March instant. His Honor also awarded such damages (if any) to the plaintiff, and directed that the amount of such damages should be assessed by a jury before him on the 14th May next; the costs of this application to be paid by the Crown.

The order was made in this form, because the plaintiff alleged (what was, however, denied on behalf of the Minister) that the department had, previous to the resumption, some eighteen months ago, proceeded with the work, and this caused the plaintiff much injury.

I thought it better to let the order go in this form, as the judge was disinclined to dissolve the injunction without reserving to the plaintiff his right to compensation for any prior damages done to him by the action of the Government.

I return the papers temporarily herewith, and I shall be glad to have the same back as soon as possible, with full instructions as to the action of the Government before the resumption, in order to enter a defence to the action set down for the 14th May.

I have, &c.,

ERNEST A. SMITH,

Crown Solicitor.

Submitted.—J.B., 22/3/94. Seen.—Let all necessary steps be taken to defend this claim. Mr. Darley, be sure to have the evidence very carefully prepared. I think any serious claim most unwarrantable.—W.J.L., 22/3/94. Mr. Darley.—J.B., 22/3/94. Very urgent.

So far as this branch is concerned, I am not aware on what grounds any claim can be based, but the Sewerage Branch cut a drain through the swamp some time back, and it may be this drain the claimant is referring to. Perhaps the papers had better be referred to Mr. Hickson, so that he may have the matter looked into, and a report obtained from his officers as to how far the work referred to can have injured Macnamara.—C.D., 27/3/94. The Under Secretary for Public Works.

Mr. Hickson, please consult with Mr. Darley upon this matter, which is very urgent.—J.B., B.C., 28/3/94.

Mr. Darley and myself went over the ground this morning, and are therefore seized with all the facts of the case. The papers might now be returned to the Crown Solicitor, and a conference arranged for at an early date.—R.R.P.H., 29/3/94. Papers 92/490 attached. Under Secretary.

Crown Solicitor.—J.B., B.C., 30/3/94.

No. 39.

## No. 39.

## Summing up of His Honor the Chief Judge in Equity.

MACNAMARA v. SMITH.

Before His Honor the Chief Judge in Equity and a Jury of four.

Thursday, 14th June, 1894.

*His Honor*: I find on looking through the exhibits that the statement of claim and the original decree are not in evidence. I do not know whether it is absolutely necessary that they should be in evidence, but it is impossible to find out what the injunction was that was dissolved unless the pleadings are in evidence. I want to refer to these, and I think that these documents ought to be in evidence. The order dissolving the injunction was put in, but it is nonsense standing by itself.

*Mr. Pilcher*: I do not think there could be any possible objection to these documents going in, and these are issues in the suit.

*Mr. Owen*: If your Honor thinks they ought to go in, we have no objection.

*His Honor*: Are they to be defendant's exhibits?

*Mr. Pilcher*: It does not matter an atom. [*Statement of claim and decree put in, Exhibits 21 and 22.*]

*His Honor*, in summing up, said: Gentlemen of the Jury, the issues before you have been referred from the Court of Equity under these circumstances:—In 1889 the Government have constructed a canal up to a point somewhat south of the plaintiff's dam; and the plaintiff, anticipating some possible injury from the construction of the canal, and ascertaining that the Crown had not resumed the land for the purpose of constructing this work, instituted proceedings in Equity against the defendant, the Minister for Works, asking for an injunction to restrain the defendant from continuing the construction of the canal, and from interfering with the water in an ancient watercourse. He states in his statement of claim that through the land which he rented from Mr. Cooper "a certain ancient watercourse runs, and has run from time immemorial, which said watercourse supplies the water necessary for carrying on the said wool-scouring works; and the plaintiff charges that he is well entitled to be unmolested in the use of the water that flows thereby." He then refers to the works that are being carried on by the Government, and says he believes "that it is the intention of the defendant to continue, and is now in the act of continuing, the said watercourse above the lands so leased by the plaintiff, and thereby to draw off and divert the whole of the water which flows and has flowed along the said ancient watercourse through the plaintiff's said land." Of course none of these works now referred to had then been constructed, but what he anticipated was that they would affect the water supply. The Government had not then resumed the land, and there was no evidence before the Court, as there is now, of their having obtained leave or license from the owner of the property to construct these works. The Court in 1889 granted an injunction in these terms: "This Court doth order that the defendant, his officers, contractors, servants, workmen, and agents be hereby restrained from proceeding with the works in the statement of claim mentioned to the north of a line drawn from east to west running through a point two and a half chains south by the southern boundary of the plaintiff's dam." That was the injunction the plaintiff got in 1889 to restrain the defendant from dealing with the canal works, and prevent him from diverting the water in the watercourse. Matters remained in abeyance until 1891, when the Government had it in contemplation to make a storm-water sewer in connection with the general scheme of sewerage for that part of the suburbs of Sydney. For the purpose of constructing this storm-water sewer they proposed to take part of the channel of the old Macdonaldtown Creek, and to run the storm-water sewer, which was to be made of cement, along the old course of the Macdonaldtown Creek. Then there was to be an outlet from that sewer so as to enable the storm-water that came down that sewer to get away, and that outlet was made along the line of what has been spoken of in these proceedings as the extension, so that the water coming down the storm-water sewer would get away through the extension into the canal, which has been formed by the Government, and ultimately find its way into the sea. The extension was not a continuation of the canal, although no doubt the canal itself is ultimately intended to be made along the line of the channel which has been made to carry off the storm-water that came down the sewer. I draw your attention to this because the learned counsel for the plaintiff spoke at one stage of the case of the high-handed action of the Government. He seemed to imply that the Government was defying the Court—acting in a high-handed way, and disregarding the rights of the owners of the property. As far as the injunction of the Court was concerned there was no disregard of that whatsoever. What the Court restrained them from doing was from continuing the canal or diverting the water from the watercourse referred to. Neither of these things were affected by the work directly at any rate or intentionally, which they were then carrying on. So far as the Court was concerned, there was no flying in the face of its jurisdiction. When the Government contemplated the construction of this work there were two courses open to them: They might have resumed the land and paid compensation which would have had to come out of the pockets of the taxpayers, or they might get the leave and license of the owner to make these works. They adopted the latter course, and it appears to me they were doing what a careful and prudent Government certainly ought to have done to save the taxpayers' pockets. They got leave and license from Mr. Cooper without resuming or paying compensation. Having got that leave or license, or thinking that they had got it, they then proceeded with the work. I want to draw your attention to the way in which this leave and license was obtained. Mr. Cooper, the owner of the land, resides in England; and Mr. J. R. Hill represents him here under power of attorney. The power of attorney was put in evidence, and according to my construction of that document, as far as the law is concerned, it did not appear to me that Mr. Hill had authority under it to bind Mr. Cooper in giving this leave to the Crown; but Mr. Hill, when examined, pointed out that as far as he had been able to ascertain, Mr. Cooper had left the entire management of his estate to him. He said that on several occasions he had written to Mr. Cooper to obtain his directions and advice as to things to be done in connection with his estate, but Mr. Cooper had invariably written back to him and said he had left it entirely to him, and trusted entirely to his discretion. Mr. Hill therefore considered that he had power to act for Mr. Cooper, and to give leave and license which Mr. Cooper, if he had been here, might have given. As far as the authority of Mr. Hill is concerned, I think you need not trouble yourselves about it. The leave was given early in 1891, the work was constructed in that year, and finished in September of that year. As far as the evidence goes, there has been no indication that Mr. Cooper has ever repudiated the action of his agent, and therefore, for the purpose of considering this matter, I think you may take it that Mr. Cooper has ratified the action that has been taken by his agent. That possibly might not be the case if this were a contest between Mr. Cooper and the Government, that is to say, that Mr. Cooper might say to the Government, "Mr. Hill had no authority to give this leave, I must insist on your resuming the land and paying me compensation." I think that in a case of that kind Mr. Cooper might set up that he was not bound by Mr. Hill's action. Here, however, it is a question as to how far the Government were acting with due regard to the interests of the property-holders, in carrying these works through their land without resuming it, in the ordinary way under the Act. When the matter was referred to Mr. Hill he consulted Mr. Fisher, who is the surveyor in connection with the Cooper estate. Mr. Fisher went out to the land and examined it carefully with a view, as you will see from the document to which I will refer presently, to a great extent in determining whether this proposed work of the Government would interfere with the water rights of the tenants of Mr. Cooper, because if it did, it might possibly bring Mr. Cooper into conflict with his tenants. Of course Mr. Cooper was anxious that his tenants should have no molestation as to their rights which they might have as tenants from him. You will remember that Mr. Hill said in the witness-box that he impressed it upon the Government that nothing was to be done which would interfere with the water rights of the plaintiff or the other tenants. Accordingly Mr. Fisher went out to look at the proposed work which the Government had in contemplation, and on the 23rd March, 1891, he sent in this report to Mr. Hill. [*Reads Mr. Fisher's report.*] That was the report that was sent in by Mr. Fisher under the directions which he received from Mr. Hill, in order to give Mr. Hill the material for determining whether he would consent to these works or not. Then the next document which was received was a letter from Mr. Hickson, the Engineer-in-Chief for Roads, Bridges, and Sewers, dated the 26th March, 1891. [*Reads letter.*] These are the terms which the Government say they were prepared to carry out, and practically they are the same terms as mentioned in Mr. Fisher's report. On the 31st March Mr. Hill replied to that letter. [*Reads Mr. Hill's letter.*] So Mr. Hill gives his consent to the Government taking this land, so long as the water that flows to Macnamara's establishment is allowed to flow there, and the provisions referred to by Mr. Hickson are carried out. Those provisions were to carry the water over the Macdonaldtown Creek when required to do so, and to carry Shea's Creek across the sewer in a wooden flume. Now that has been carried out to the letter by the Government, with one exception, that they have put a cemented flume instead of a wooden one. In every other case the requirements of Mr. Hill, which were made with a view of safeguarding the plaintiff's water supply, have been.

been carried out by the Government. That shows that, so far, at any rate, from acting in a high handed way, and disregarding the rights of the proprietor, the Government did not interfere with the injunction which the Court granted, nor have they disregarded the rights of the owners of the property. It may be, when you come to consider the evidence, you may find that the plaintiff has suffered injury nevertheless. It may be, that carrying out these works, however carefully the Government may have constructed them, that you may come to the conclusion that the plaintiff has suffered injury, and the arrangement made between Mr Hill and Mr Hickson would not prevent you from returning a verdict in favour of the plaintiff. I bring these matters under your notice to show that the Government have not acted in any way in a high handed manner, so far as the requirements of Mr Hill are concerned, because the Government have carried them out to the letter—and better—by giving a cemented flume instead of a wooden one. Having got this leave and license from Mr Hill in March, 1891, the Government commenced to construct these works, and in September, 1891, they were completed. Early in 1894 the defendant applied to the Court to dissolve the injunction that had been granted, pointing out that when the injunction was granted, the land had not been resumed, but that the Government had, or were about to resume the land. As a matter of fact, the Government did resume the land on the 6th March last. In dissolving the injunction, in order to safeguard any possible right the plaintiff might have against the Government for constructing this work, counsel for the defendant submitted that if any injury had occurred to the plaintiff, the Government was admittedly responsible for it, but I want you distinctly to understand that there was no admission in any shape or form of any liability whatsoever on the part of the Government. All they said was that if injury was proved to be sustained by the plaintiff for which defendant was liable, he submitted to pay what damages might be assessed in respect of that injury. Upon that submission the Court directed that these issues should be tried, (1) whether the plaintiff has sustained any damage in respect of the matter referred to in the order of the 20th March mentioned, and (2) what is the amount of such damage. These issues have been referred to you in order that you may inform the mind of the Court by your findings upon them. Before I go into these issues there is one matter which I wish to mention without laying any stress upon it myself, but merely for the purpose of showing what has been referred to by counsel for the defendant, leaving it to you to give it as much consideration and weight as you may think it entitled to, and nothing more than that—and that is, the delay on the part of the plaintiff in bringing forward his claim. You will remember that the counsel for the defendant spoke of the plaintiff lying by. You know that the plaintiff had an injunction in 1889 for anticipated injury, not real injury, because the works had not been constructed. In the beginning of 1891 he must have known that the works of which he now complains were being constructed. We know, as a matter of fact, that there were interviews with the Government with reference to them. If the plaintiff was so alarmed at anticipated injury when the works had not been done, it may be said that as soon as the works were commenced again he might have taken action, and if it did not fall strictly within the terms of the injunction it was open to him to institute new proceedings and ask for an injunction to restrain the defendant from proceeding with these works. The works were finished in 1891. In the beginning of 1892 the plaintiff says he began to suffer damage, and that this damage continued all 1892, the whole of 1893, and the first four months of 1894, without any action being taken by the plaintiff at all. Even then he does not come into Court to ask for its interference. It is the defendant Minister who comes to ask for the injunction to be dissolved. You have to take these facts into your consideration and give them as much weight as you think they are entitled to. Of course mere delay does not prevent a plaintiff from obtaining a remedy if he is wronged. At the same time you have to consider how far the plaintiff has suffered and whether it really was a serious interference with his business. You will take into consideration that he saw the works going on in 1891, and for nearly two and a half years afterwards without taking any action against the Government. These are matters more with regard to the *bona fides* of the claim than as to the rights of the parties. Notwithstanding that, if you think the plaintiff has really suffered an injury his rights would not be interfered with by this delay. The plaintiff's claim is a peculiar one, and it is a little complex. It was said by one of the witnesses on behalf of the defendant that the plaintiff had said to him that he did not claim for loss of water but for the pollution of the water. Now the pollution complained of is not the act of the Government in dirtying the water. It is not as if the Government were carrying on a business of some filthy description such as boiling down, and that they deposited filth from their works into the stream. What the plaintiff says is that the water originally came into his dam in a cleaner condition than now, for two reasons, one that there was a greater quantity of water in the channel, and the other that there was a greater quantity of water in the swamps surrounding the channel, consequently the water that came into the dam was more diluted. Now he says all this water supply has been cut off, and the water comes into the dam in an undiluted form. Therefore the question of loss is really the pollution of the water. So far as that is concerned he does say that there is a diminution in the supply, but the great point is that it is more polluted. In one respect it is more polluted by the diminution of the water in the swamp, and on the land surrounding the creek, which water formerly diluted the stuff, therefore made it more fit for woolwashing. He says that in this swamp there was a mass of reeds, rushes, flags, water grass, and impure water passing through that became filtered, because the reeds and vegetation arrested the solid matter which was held in suspension and precipitated it to the bottom of the swamp, so that when the water flowed into the dam it came in a cleaner and purer state than it would otherwise have done. The plaintiff says that that is the injury which he has suffered so far as Shea's Creek is concerned. As far as Macdonaldtown Creek is concerned, the plaintiff says that the whole of that water is cut away from him. The present sewer which runs at right angles to the creek cuts off the liquid—I can hardly call it water—that used to come down the creek, and the plaintiff says that the result of the defendant's work has been to alter the position of Shea's Creek. He says that Shea's Creek, before the work was commenced by the Government, stood on lower ground than the present extension, and in consequence of defendant's work the ground between Shea's Creek and the extension has shrunk, consequently Shea's Creek is higher than the extension, and that has had the effect of drawing off the water from Shea's Creek to the extension. He also says that that had the effect of drying up the ground between the creek and the extension, and destroying the reed beds, which he says acted as a filter. The plaintiff further states that as far as the channel of Shea's Creek is concerned the water in the swamp used to act as retaining water—that is to say, there being water on both sides of the channel, that water retained the water in the channel of Shea's Creek, but that water being drained away the ground became dry, and instead of the water being maintained in the channel of Shea's Creek it percolated and ran away to the lower ground, and so diminished the supply that came into the plaintiff's dam. Then there is the further claim which was not much relied upon by counsel, but was mentioned by the witnesses, that a supply of water in heavy rainstorms used to overflow the banks into the swamps, ultimately getting into the dam. The plaintiff relies on the position of the reed beds, and he also says that the sewer which runs at right angles to Shea's Creek diverted the storm water that overflowed the banks and spread over the country to the north of the sewer, so that this water instead of passing into the plaintiff's dam fell into the sewer. There is one other matter which the plaintiff refers to as adding to the impurity of the water, and that is from the diminished supply he was not able to flush out the dam as effectually and as often as he would otherwise have done. The plaintiff says that in former times they could open the sluice gate, and the rush of water carried away the filth in the bottom of the dam, and the dam was kept cleaner than at present. I intend to refer briefly to the way the defendant meets these claims. As far as Macdonaldtown Creek is concerned you have to bear in mind that the sewer which has intercepted the flow that came down the old Macdonaldtown Creek has taken away from the dam the stuff that came down the creek, which has been described as being sewage of the most offensive character. You have to consider whether it really would be an advantage to the plaintiff to have that filth coming down to his dam in dry seasons, and, whether seeing that the plaintiff is claiming more on account of the pollution of the water than of loss of the supply, whether the cutting off of this flow would lead to the pollution of the water in the dam, and make it worse than it would be by having this filth taken away. Of course, if you add dirty water to dirty water you increase the quantity, but you cannot improve the quality. Then there is this paragraph in Mr Fisher's report, in which he says that the overseer of the works is of opinion that it will be decidedly to their advantage to be able to shut off the dirty Macdonaldtown water and only let the stormwater in. Of course, in rainy seasons there would be a considerable flow of water coming down the Macdonaldtown Creek, which would be a good deal diluted, and it might be a great advantage to get that supply into the dam, and the defendant says that Mr Fisher recommended, and Mr Hill insisted upon, stop-gates being put into the sewer by which they could arrest the flow of the stormwater and divert it in the plaintiff's dam. The defendant says that these stop gates were put there, and it was part of the arrangement that they were only to be used when the plaintiff required them, and he had not so required them. The defendant says that if this filth were allowed to run down the Macdonaldtown sewer into the dam, the plaintiff's position would be worse instead of better, but if he wants the stormwater, they have the gates there to throw it off into his dam. That is how the claim as to the Macdonaldtown Creek was met. It is said that some correspondence took place between the department and one of the municipalities in reference to this sewer. If this water was thrown back, as of course it would be if the stop gates were put in, it would possibly do an injury to some of the municipalities adjoining this sewer, and it might lead to litigation. I do not think



you have anything to do with that whatever. No action ever was taken, and it is a mere correspondence between the Government and a municipality. If the Government are willing to run that risk, I do not see that the plaintiff has anything to do with it. If the plaintiff had gone to the Government and said, "Put these stop gates up, as I want the stormwater," and the Government said, "We are quite willing to do so, but the municipality objects to it, therefore we will not do it," the case would be entirely different. No application was ever made to the Government, and there was no refusal on the part of the Government. Now we come to the claim as to Shea's Creek, and one of the first points taken with regard to that was whether that creek was natural or artificial. Neither council seemed to think it was a matter of very great importance; at the same time it is an issue put before you and it is a matter you will have to consider; in fact, it is one of the questions I will ask you to answer for me. If it is an artificial channel there is no evidence to show when it was made, or by whom. The only evidence that I am aware of that in any way bears on it, as far as date is concerned, is furnished by the maps, one of which was prepared in connection with the Sewerage Commission of 1875, in which this creek appears without any name, but there is a channel that appears to run into the swamp before it comes to Eve's. There is another map made by Mr. Parrot, one of the plaintiff's witnesses, which appears to show that at the time that map was made the present channel was not in existence. It appears to me that that is the only evidence when the creek was made, if it is an artificial channel. On the other hand you have a mass of evidence given on behalf of the plaintiff by a large number of witnesses, some of whom have known the channel as far back as fifty years, and they say that the position of the channel of Shea's Creek is the same as it was when they remember it first. The only witness who appears to bear out the statement that it was known as an artificial creek was Mr. William Foster, who was called up on behalf of the plaintiff. He said he never knew it as a creek or a river, but as the Big Swamp or the Little Swamp. You have heard the evidence, and it does not follow that because I cannot recall any other evidence on this point that you cannot, but it is the only evidence that I can remember that in former times there was no channel. Then you have these two maps to which I have just referred—that prepared in connection with the Sewerage Commission, showing the position of the channel above Eve's, and a huge swamp in front of it coming all the way down to the plaintiff's dam. Then the engineers and surveyors, called on behalf of the defendant, say that it must be an artificial channel mainly for two reasons, one is that it stands at a higher level than the surrounding country and the other that on the eastern side of the channel there is an artificial bank. These witnesses comprise a large number of gentlemen who know the locality well and they have been out several times. They say that the bank on the eastern side is formed of the material dug out of the race or channel and thrown up to keep the water in. The plaintiff's witnesses say that that is a natural rise in the ground and that the top of that stuff was taken out in cleaning the creek and not in making it. The plaintiff says that originally Shea's Creek, was lower than the swamp and that the water therefore did flow in its natural way along the lowest part of the ground. The defendant's witnesses say that at any rate as far back as 1889, that is before these were commenced at all, Shea's Creek stood higher than the ground in the swamp where the extension now is, and consequently it must be artificial. Everyone knows that the tendency of water is to flow to the lowest level and it will not unless some artificial means is used, keep on the high ground, so that if you are looking for the old immemorial channel of the stream you always go to the lowest ground. The question whether it was relatively higher in 1889 is one which must be determined by the levels. Mr. Parrot, one of the plaintiff's witnesses, says that when he went out in 1889 the ground was all under water, and a swamp, so that he took no levels; but before that the Government sent out Mr. Halligan, and he took all the levels for the proposed extension, which you have plotted upon Exhibit 3. These levels were taken in 1889. If you believe these levels to be correct, and to have been taken at the time stated, they will solve a great many of the questions arising in this case. You have levels taken along the course of the creek to the point where it debouches into the swamp, and down to the extreme end of the extension. You can compare the levels in the bed of the creek with the levels where the proposed canal was to go, and where this extension now goes, and they will tell you exactly what the levels were if you believe the evidence in respect to them. One of the defendant's witnesses says that the swamp is not a dead level, but that there are little hills and hollows in it, though they are mere depressions. You will bear that in mind in comparing these different levels, when in one place they appear to be a little lower than another. That may arise from the fact that the general level of the ground is not different, but that there is a slight elevation at that particular point. It appears to me that the fairest way is to take the levels all through, and to determine generally what the flow of the water was. I do not want to express any opinion as to the levels, because the figures are before you. It appears that in 1889, except in the part nearest to the storm-water sewer, the land that was on the higher level than the level of the proposed extension. Mr. Hickson, and one or two other witnesses called for the defendant, stated that, although they could not take levels on account of the ground being covered with reeds and water, they could see the water flowing from Shea's Creek to the extension. If you see water flowing in a particular direction from one place towards another, you come to the conclusion that the point from which the water is flowing is higher than the other. It appears to me that, although the difference does not appear to be very great, a comparison of these figures bears this out. It is quite possible that the difference may be so slight as in no way to lead you to suppose that this is an artificial channel. However, that is a matter you have to determine yourselves. Then, it is said, there is a break away at a point marked 200 yards north of Eve's, and from that it appears to be the lowest level. You have seen the place yourselves, and you are better able to form an opinion than I. You have seen the position of the bank which, it is said, was put there to restrain the creek in this channel, and you will be able to say whether it really exists, or whether it can be otherwise accounted for. It was said by one of the defendant's witnesses that there was an old channel there, but that is a matter for your observation. You remember Mr. Godfrey's evidence that what is carrying part of the water there was made by him as late as four or five years ago. I do not think I need trouble you any further on the question as to whether the stream is natural or artificial. The most important question, to my mind, is as to whether there was any loss of water in the channel of the creek or not. I want you to distinguish carefully between loss of water in the channel itself and any loss of water through draining the swamp or diminution of any other water in any other way. The greater part of the defendant's case went to show that as far as the channel was concerned there was, as a matter of fact, no loss. The first point taken in the evidence was as to the flume, which is the only place where any alteration has been made in the creek. The question is whether the flume will carry all the water that the channel will carry. The water may flow over the banks and come back again into the channel, but the question you have to decide is only as to the water that can flow into the channel without overflowing the banks. If you are satisfied that there is no loss of water there, that is an entirely distinct question from any loss of water that may arise from the draining of the swamp. I will deal with the question as to the size of the flume. We have a diagram in evidence, prepared by Mr. Halligan, showing the area of the stream 25 yards north of the flume, 15 yards north of the flume, and 15 yards south of the flume, and showing the area of the flume itself. If you believe this diagram to be correct, it appears to me to be absolutely conclusive of this point. The whole capacity of the flume is 60 12 feet; 25 yards north of the flume the area of the creek is 60 27, and at 15 yards north it is identically the same as the flume itself, namely, 60 12. The area 15 yards south of the flume is 60 27, but that makes very little difference. Then Mr. Gribben, the plaintiff's engineer, who has been there since 1888, says it carries just about the same quantity as before, except when the flume was broken away and allows the water to escape. So far as the flume is at present constructed, I have shown you from the actual measurements that it is exactly the same size as the creek 15 yards north, and we have the evidence of one of the plaintiff's employees to the effect that just about the same quantity of water passes over the flume as along Shea's Creek before the flume was put up. Then, there is the evidence of Mr. Parrot, one of the plaintiff's engineers, on this point. He says he thinks there is about the same quantity of water flowing into the creek in 1894 as in 1892. He is a scientific witness, well acquainted with the locality, he having been there when he prepared the map for Colonel Scratchley. Before I go into the actual tests, I think there is one general observation I ought to make. The plaintiff says that this soil is naturally porous, and consequently the water escapes from the channel of the creek. The Government have not made this soil porous. It is the natural character of the soil, and if that is so, surely a certain amount of percolation must have been going on at all times. If you find from actual test that there has been a certain loss, you must not consider that that loss has been necessarily caused by the Government works, because if a certain amount of percolation has been going on from time immemorial owing to the nature of the soil it would not be fair to attribute it to the canal works. You may consider that although it has been going on from time immemorial the Government works have increased it, and, of course, you are entitled to so find. There is another remark that has no doubt occurred to you, and that is that if the effect of the Government works was to drain away the water, how is it that the swamp as it at present exists is there? If the effect of the Government works is to draw all the water off, one would have thought that the effect would have been to drain this swamp also. However, this is a question for you to consider, and you know a great deal more than I do, because you have been out there. I throw this out merely as an observation, to which you can give what weight you think it is entitled to. It is said that originally there was a swamp all round this channel, and that this swamp had the effect of retaining the water in the channel. That depends on the condition of things before the extension



extension was made. As far as I have seen from the evidence, there appears to be very little conflict as to that, because Mr. Davis says that before he went there there was a swamp within a few feet of the creek, right up the whole of the creek to where the sewer comes down. Mr. Parrot, who drew these maps which were so much before you, showed upon one of them where these waters were in 1889, and he showed that the swamp went up as far as Mr. Davis said it went. I do not think there can be any conflict as to the position of the land now; you know more about it than anybody that has been there lately, and you will be able to contrast what was there in 1889 with the state of things existing now. Although the water may be drained away from the swamp, it does not at all follow that the water has been in any way diminished in the channel, because the question whether there has been percolation or not is really one of tests, or, you may think, of theory; but if the test show that there has been no percolation, that is conclusive, because fact must always conquer theory. Then comes this question of the difference between the engineers as to the gauges. If you believe the gauges taken by the Government officers, they establish not only beyond all controversy, as far as their gauges are concerned, that there has been no loss of water in this channel, but a gain. They gauged the channel in a great number of places from beyond the flume to the dam, and although in one gauging there was some loss, in all of the others there was an actual gain. That may possibly appear to throw some doubt on the accuracy of the gaugings, but I do not see why it should, because they say that the increase would be water percolating into the channel from the swamp, which, of course, they could not in any way gauge. There is a distinction between the quantity of water coming in from the swamp and the quantity actually flowing along the channel. If you take their gaugings as correct as far as the bed of the channel is concerned there was no loss of water at all. Not satisfied with that they took gaugings in the extension itself, right from a point above the junction with the sewer to about half way along the extension, and there they have determined whether or not there is any gain of water in the extension, because the theory of the plaintiff is that there is a loss in the creek, and the ground in the extension being lower, the water percolates from the creek into the extension, and, therefore, must appear in the extension. If that is so, there would be an increase of water in the extension, whereas these gentlemen, the defendant's witnesses, prove that there was no loss in the creek, and in the extension there is no gain. Further, they have put down certain test holes, and they say that if the water was percolating from the creek towards the extension it would appear in the sides of the test holes, whereas there is none. Mr. Simpson and Mr. Cardew, engineering witnesses, on behalf of the plaintiff, took gaugings, and the result of them was that there was a very great loss of water in the channel, and a very great gain of water in the extension. As far as the extension is concerned, I will deal with the evidence of the plaintiff's witnesses first, because it appears to me that their evidence is, at any rate, rather strange. All they did was to take gaugings about the middle of the extension. They found the quantity of water flowing there to be 1,766 gallons per minute, and they said a very small portion of that came from the sewer, and all the rest of it must have come from Shea's Creek. When the Government witnesses go there they see that there are no less than four different places where the water comes into the extension in addition to the sewer; it makes just all the difference. I will refer to Mr. Simpson's evidence, because it appears to me that I am right in what I stated. [*Reads Mr. Simpson's evidence, at page 219.*] Then Mr. Cardew, who took the gaugings with Mr. Simpson, says exactly the same thing. You see, they say distinctly that they do not know how much water came from the Macdonaldtown sewer, but it was very small, and no other source of water was coming into the extension, with the exception of percolation from Shea's Creek. Therefore the great bulk of the 1,700 gallons must have been percolation from Shea's Creek. When you come to the gaugings on this extension you find that they, the Government officers, gauged at six different places from H 1 to H 6, and also two overflows that came from the flume at the Chinaman's gardens, at G 3 and G 2. At H 1 there were 825 gallons per minute passing, and at H 5, which was the outfall of the Macdonaldtown sewer, there were 322 gallons per minute passing. Mr. Simpson takes only in two places; he takes the total and the quantity from the Macdonaldtown sewer. He does not gauge the quantity in the Macdonaldtown sewer; he guesses it. When you come to the actual gauging of the defendant's witnesses the outflow from the Macdonaldtown sewer was 322 gallons. That left about 500 gallons to be accounted for. According to Mr. Simpson, that must come by percolation from Shea's Creek. The defendant's engineers say no, there are a whole lot of other sources you have not taken into consideration; for instance, H 6, which is the water that comes down from Godfrey's at the junction, and that is 279 gallons, and this was wholly ignored by Mr. Simpson, as were the flows from G 3 (131 gallons), at G 2 (42 gallons), and three others, amounting to 10, 3, and 14 gallons respectively, so they actually gauged every source of water coming into the extension, and they find it comes to 810 gallons, as against 825 gallons going out. If Mr. Simpson's gauging is taken it really appears to me to be no test. He does not give any quantity of water coming down the Macdonaldtown Creek, and he wholly ignores these other sources of supply. It appears to me that there can be no doubt whatever that it is no test at all. If you take the gauging by the defendant's witnesses there is only a difference of 15 gallons out of 825 gallons, and that 810 gallons flow in from the creeks, watercourses, and streams coming down on the surface. Therefore, there was no addition to the extension according to their evidence. Now, I come to the gauging on Shea's Creek. Mr. Cardew's evidence, which I think is practically the same as Mr. Simpson's, shows that 2,222 gallons were passing at the flume, and that there was an actual loss of 557 gallons in the channel of Shea's Creek. On the 15th May there were 1,151 gallons per minute passing in the flume, and at a point 250 feet further down in the channel 891 gallons per minute, showing a loss of 258 gallons in that distance. If you take the evidence of these gentlemen as correct, there was a very considerable loss of water in Shea's Creek. Mr. Simpson makes it a little less. He says it was 541 gallons on the first day, instead of 557, as given by Mr. Cardew, and on the second day 248, instead of 258. The gaugings were taken on behalf of the defendant by Messrs. Carleton, Davis, Grimshaw, Chamier, Napier Bell, and Stayton, and although the results are very much the same, they do not actually coincide. With the exception of one of these gaugings, they all show a gain of water. Then comes the question which of these two gaugings is the more reliable. Properly speaking, this is not a question for you to answer, because it is really a scientific matter, but a great deal of evidence has been given upon it, and as the question is really thrown upon you, you will have to answer it. The mode adopted by the plaintiff's engineers was to take the sectional area of the creek, and what was ascertained to be the velocity of the stream by multiplying one with the other. They say that that gives the best results in this creek, because they say that, in the mode of gauging adopted by the Government, namely, that by weir, there is apt to be a loss of water through percolation getting under the weir or round the weir at the side. Therefore, the weir mode in a channel like this is not so satisfactory as that adopted by the plaintiff's engineers. The plaintiff called Mr. Knibbs, a gentleman who occupies the position of lecturer at the University, a gentleman who has no doubt considerable theoretical knowledge, and is, I have not the slightest doubt, a very able man. Mr. Knibbs says, "In my opinion the most accurate method of gauging would be to find the velocity on the surface and the sectional area, and then to multiply each factor into the sectional or into the symmetrical line on each side of it, and then to multiply the velocity by '9.' You find the surface velocity in the centre filament of the stream of a given sectional area. You multiply the velocity by '9.' Assuming that Mr. Simpson and Mr. Cardew did not multiply by '9,' their calculation would be in excess, I should say, by a maximum of 10 per cent. That is what Mr. Knibbs says is the proper method, but it is not the method adopted by the plaintiff's witnesses. Mr. Knibbs says: "The result of multiplying the sectional area by the velocity should be multiplied by '9,'" so that the plaintiff's engineers left out one multiplier altogether in their calculations, the result of which, Mr. Knibbs says, was to make their calculations in excess by 10 per cent. Mr. Stayton was afterwards called, and he said he had actually made this calculation, and that it throws Messrs. Simpson and Cardew's calculation out 28 per cent. Mr. Knibbs was then asked about the weir system, and he said that it would be inapplicable to that particular stream. Although the weir system gives a far better result, in his opinion, there would be a loss of water from what he saw of the banks of the stream. If that is so, it becomes a question of fact whether the weir system is adapted to the stream. You have heard the evidence as to what was done by the defendant's witnesses, and it is a question of fact clearly, because, if they could make the weir absolutely water-tight, it undoubtedly, according to Mr. Knibbs, would give the best results. I will also refer you to the evidence of Mr. Grimshaw, who fixed these weirs and took the gauges, and also to the evidence of Mr. Davis, to show how the gauging was done. [*Reads Mr. Grimshaw's evidence as to the fixing of the weirs.*] If you believe Mr. Grimshaw's evidence, there was no possibility of any escape. Mr. Davis gives a description of what was done a little more in detail, because he speaks of puddling. It is for you to consider the question of fact as to whether the weir was put down properly, so that water could not escape. Of course, if there is an escape of the water the weir system must be absolutely fallacious in this case. Then you have, in addition to the evidence which I have already read from, what Mr. Knibbs said, the practical experience of Messrs. Carleton, Davis, Grimshaw, Chamier, Napier Bell, and Stayton, that the weir system is the best for that particular stream, and you also have the evidence of Mr. Darley, the Engineer-in-Chief for Harbours and Rivers, and of Mr. Hickson, the Engineer-in-Chief for Roads, Bridges, and Sewerage, and they also say that it is the best for this kind of stream. Mr. Hickson says that to have a true test in the way in which the plaintiff's engineers have proceeded you must have a uniform section, such as in a sewer, and then the question was asked whether the flume would not furnish such a section, but Mr. Hickson said

it would be as far as it went, but it did not go far enough, because, in order to get a proper estimate, you must have at least 40 or 50 feet to get a reliable result, whereas there was only 20 feet in the flume. In addition to this, you have the authority of certain writers whose names I do not remember, who all speak of the weir system as the best. That appears to me to be the whole of the evidence on this question of gauging. It is for you to determine which was most applicable for this stream and which gives the most reliable results. If you adopt the mode used by the plaintiff, there was a considerable loss of water in the channel of Shea's Creek and a gain in the extension; if you take the defendant's method, there was practically no loss in the channel, and in the extension there was practically no gain. The only other two matters are with reference to the swamp and the reed bed, and, as I said, that depends on the condition of things in 1892 and at the present moment. I need not trouble you on that point, because that is a matter within your cognisance, and you will be able to determine it. On the other point as to whether the plaintiff had the water to flush out his dam, there is the evidence that as it is at present the dam will fill in eleven hours. That is sworn to by the man who watched it, and also by Mr. Davis. If you come to the conclusion that this could be done, it becomes a question whether the plaintiff could not have flushed out his dam if he had wanted to have done, and whether he could not have flushed it out on Saturday night and filled again and ready for work on Monday morning. On the other hand it is said that if all the mud were cleaned out it would take as much as fifty hours to fill. I do not think you have really got to deal with that, because the question is whether, from 1892 up to the present, he could have gone on flushing the dam so as to clear out the dirt that came in in that time, he could not expect to make his dam cleaner than it was in 1892, and if he could have relieved it of the impurities that came in since that time, and he did not exercise that power, he cannot come against the Government for that. Then there is one general remark with reference to this alleged pollution of the water which I think I should make, and that is, that if these reed-beds and places really do act as a filter, it appears to me that the filth must have gone on accumulating from year to year. These works have been there for a very long time. The plaintiff has had them for thirteen or fourteen years, and a great many people had them before him. If these reed-beds have been filtering the water for fifteen years or more, must that not have made them more and more filthy, so that every year the water coming into the dam would become more and more impure? I do not think there are any other matters I wish to draw your attention to. Mr. Smith, the counsel for the plaintiff, has gone at very great length into the plaintiff's evidence, quoting from it; and I should only be wearying you by drawing your attention to it again. Because I do not do so, do not imagine that I pass the evidence of these gentlemen over negligently; what they said is fresh in your memory, and you will give it all the weight you think it deserves. Then as to the question of damages, it appears to me that the only way in which the defendant met this part of the case was by the evidence of Mr. Robertson, the accountant, and Mr. Hawksworth. As far as Mr. Robertson is concerned, he said simply that the books referred to him did not enable him to make out all the particulars of the plaintiff's claim. Whether they do or do not, you have the evidence of the plaintiff's witnesses as to the amount of wool treated and sold, and as to the quality of the wool previous to 1892 as compared with the quality since that time, and from that evidence you can form your opinion. Although the books may be badly kept, and it may be impossible for a skilled accountant to trace every item, it is a matter for you to consider whether the fact that the evidence was not in the books is evidence of the non-existence of the item. You can prove it outside the books as well as inside the books. A great deal has been said about the account sales, but it appears to me that if they had been put in they would not have proved anything. When a plaintiff gives particulars of his claim the case is entirely different from one wherein damages are sought for trespass or libel, and the jury are simply asked to give what they think fit. But here the plaintiff has claimed that he actually suffered certain specified injuries. Of course, if he wants to establish these he must prove them, and if he does not prove them you may take it that there is no evidence on the subject. If you see that the plaintiff has suffered some injury and he is entitled to some damages, you may discard the particulars altogether and give him what you think he ought to have. These account sales were simply a report made by the agent of the bare results of the sale. If the bare results were given by a witness in the box there would be no real difference, because, as was pointed out to you, the value of wool fluctuates so. You have to get all the circumstances attending the sale, whether there was a large attendance or a small attendance, and whether there was a demand or not for that particular kind of wool, or fifty other different things. For instance, inferior wool might sell on Tuesday at a much higher price than the very best wool sold on Monday. You are entitled to bear this in mind, that when these two classes of wool were submitted to Mr. Moore and the other experts they said that one wool was superior to another, and they valued one wool as so much and the other at so much, and they said there was a loss in the quality of the wool of so much. Then, on the other hand, there is the evidence of Mr. Hawksworth, who says that he got a bottle or two of this water out of the dam. There is no question as to its being a fair sample. He says he washed two samples of the wool in that water. One of them undoubtedly is very dirty, but the other is a good colour. He was asked how he got that good colour, and he said that he washed it in the water at a temperature of 95 degrees with a good deal of soap. If you are satisfied that that result was fairly obtained with the water, and that the plaintiff could have done the same but did not do so, he cannot claim anything from the Government for that. Mr. Moore was called to examine the quality of the wool by Mr. Hawksworth, and he said that he did not think it was good, but was tender, and consequently depreciated in value. He seemed to think that the extra scouring had caused it. That appears to be all the evidence on these questions. Having thus pointed out what appears to me to be the salient points in this case, I will leave the whole matter in your hands as regards the facts, but as there may be points of law, and I understand that there will be, I want you to answer certain questions, and to assess the damages separately. Of course, the first question is whether the plaintiff has suffered damage, and it comes to a question of ascertaining damages. I will ask you to assess them, so that if the points of law are decided one way or the other it will not be necessary to go back to a jury. For instance, if the Court were to think that, with reference to one part of the claim, the plaintiff is not entitled to succeed, the amount you award as to that will be struck out and the remainder stand. I take it that the points of law will be with reference to the water in the channel, the water in the swamp, and the reed-bed. I want you to answer these questions separately. I want you to assess the damages separately arising from the water in the Macdonaldtown sewer. My last words of these matters are that they are entirely for your determination alone. You must not imagine that I am expressing or intimating any opinion. Of course, it is very hard to refer to the evidence on one side or the other without appearing possibly to express an opinion in favour of one side or the other. That may arise possibly through mere intonation. You will understand that I have neither expressed nor intimated an opinion of my own. I leave the whole matter in your hands, and I have no doubt you will be able to answer these questions for me, so that if any points of law arise they can be decided.

The jury retired at 12.15 p.m., and at 7.30 p.m. returned to Court, and the foreman intimated that they found for the plaintiff, damages £10,000.

The questions submitted by His Honor were as follows:—

1. Is Shea's Creek natural or artificial? Natural.
2. Is there now as full a supply of water in the channel of Shea's Creek as before the extension and the sewer were constructed? No.
3. Has the work of the extension had the effect of drying the ground to the east of Shea's Creek, between the creek and the extension? If so, has there been any consequent diminution of water going into plaintiff's dam? Yes.
4. Has the area of the reed-bed between the extension and Shea's Creek been diminished by these works? Yes.
6. If so, has it had the effect of making the water in the dam less pure? Yes.

The damages were distributed as follows:—

|  |        |
|--|--------|
| 1. Arising from loss of water in the channel of the Macdonaldtown Creek and Shea's Creek ..... | £3,000 |
| 2. From loss of storm-water overflowing the banks of these creeks, or either of them .....     | 1,000  |
| 3. The loss of water from diminution of the swamp .....  | 4,000  |
| 4. From loss of reed-bed .....   | 2,000  |

His Honor thanked the jury for their patient attention to the case, and said he would fix an early day for hearing the argument.

The Court then adjourned.

## No. 40.

H. S. Williams, Esq., to The Secretary for Public Works.  
Macnamara v. The Minister for Works.

Dear Sir,

39, Castlereagh-street, Sydney, 26 October, 1894.

My client has desired me to prepare and forward to you a short summary of the facts of this case, as set forth in the official report of the proceedings, in the hope that a thoroughly impartial statement of the facts may lead you to see the plaintiff's position from a more favourable standpoint.

He ventures to think that hitherto you have depended for your information as to the nature of the proceedings upon the reports of the officers of your department, who obviously take a partisan view of the facts, and it is hoped that the course indicated may serve to satisfy you that the judgment of the Chief Judge in Equity is one that ought to be regarded as a final solution of the matters in dispute.

You are, of course, aware that so far back as 1889, Mr. Macnamara predicted all the difficulty which has since arisen, and gave your predecessor (Mr. Bruce Smith) due notice of those anticipations in his statement of claim, which was filed in Equity on the 27th of April of that year.

Shortly summarised, that statement of claim alleged that for more than twenty years certain wool-scouring works had been carried on on the property leased by him, that a certain ancient watercourse had run through the property from time immemorial, and that he was entitled to the unmolested use of that watercourse. It was further stated that your predecessor (Mr. Bruce Smith), by his servants, had caused a canal to be made through certain lands adjoining the land leased by him, and that he was then informed that it was the intention of your predecessor (Mr. Bruce Smith) to continue the work, which was then proceeding, to a point above his leased lands. The statement further set forth that the bottom level of the canal was below the bottom level of the said watercourse, and that the effect of the said canal would be to wholly divert the water, which then flowed on to the plaintiff's leased land, so as to wholly deprive him of the source of water supply for his wool-scouring works, and stop the industry he was carrying on.

I am desired to direct your attention to the fact that this fear was deliberately expressed five years ago, and at a time when the damage complained of had not actually taken place.

The statement referred to concludes by pointing out to the Court that, as due notice to desist had been given and disregarded, the plaintiff had no alternative but to ask the Court to restrain the defendant, your predecessor (Mr. Bruce Smith), from continuing the canal works.

The whole matter was by this statement of claim placed clearly before the Chief Judge in Equity, who, on the 30th April of the same year, 1889, after hearing counsel for the plaintiff and counsel for the defendant (Mr. Bruce Smith), restrained the latter from proceeding with the work or from otherwise diverting the water from the watercourse mentioned, leave being then reserved to the defendant to come in at any time and move that the order should be dissolved.

Five years were allowed to elapse before any further legal proceedings were taken; but, meanwhile, portion of the work complained of had been proceeded with, and the waters of the Macdonaldtown Creek had been diverted from the plaintiff's dam and carried into the then terminus of the canal, the further construction of which had been stopped by the Court.

In February, 1894, notice was given to the plaintiff of an intended application to the Chief Judge in Equity for the purpose of dissolving the injunction of the Court.

By this time your predecessor (Mr. Bruce Smith) had been succeeded first by yourself and afterwards by Mr. W. J. Lyne, who sought to proceed with the work, and with that view to remove the restriction which the Court had imposed. Counsel were again heard on both sides; and on the 20th March of this year the Chief Judge in Equity dissolved the injunction which had hitherto stopped the progress of the works; but the action of the Chief Judge was so taken on the distinct agreement between the parties, put into the form of a submission, by counsel for your predecessor, Mr. Lyne, that the question of damage as predicted in 1889, and as alleged in 1894 to have taken place, should be assessed by a jury before the Chief Judge in Equity. The issue then settled was "whether the plaintiff has suffered damages by reason of the matters in the order of the 24th March mentioned, and, if so, what is the amount of such damages."

Pursuant to the statement of this issue, the plaintiff was called upon to file particulars of his claim, which he accordingly did, under three heads, viz., damage to wool, damage to skins, &c., and general and incidental damage. Under the first head the plaintiff claimed that between the 1st January, 1892 (three years after the injury had been predicted), and 5th March, 1894 (the date of resumption), the wool scoured on the plaintiff's premises had suffered a deterioration of one halfpenny per lb., and that extra cost to the extent of one farthing per lb. had been involved in consequence of the pollution of the water by the lessening of the quantity running into the dam.

It was claimed that on the 8,779 bales (the quantity which had been dealt with by the plaintiff between the dates mentioned) the loss and extra cost amounted to £7,147. Under the second head it was claimed that between the same dates a loss of upwards of £3,000 had resulted in connection with skins, pelts, and basils; and under the third head it was claimed that £3,000 had been lost in various ways, therein set out in detail.

On these particulars the assessment of damages (if any) by the jury was commenced on the 14th May, 1894.

The Chief Judge in Equity pointed out, before the evidence was entered upon, that the submission by the Minister was only to pay the damages assessed in the event of any damage being found to have been caused by the works in question. That position was at once acquiesced in by the leading counsel for the plaintiff.

Without attempting even to summarise the immense mass of evidence which was gone into during the nineteen days which preceded the addresses of counsel, it may not be out of place to state for your information that the principal cause of loss, viz., the deterioration in the quality of the wool between the dates mentioned, was evidenced by Mr. Moore, the manager of Messrs. Harrison, Jones, and Devlin (Limited), who had passed through his hands for many years the whole of the wool fellmongered at the plaintiff's works, and who was therefore able to swear positively to the sudden and distinct falling off in quality from a certain date, at which the damage was alleged to have begun to operate. That evidence was practically uncontradicted.

At the end of nineteen days counsel began their addresses to the jury. A large part of these nineteen days was occupied by a purposeless conflict of professional testimony as to the most trustworthy method of gauging streams, in which conflict many engineers were involved on both sides, and many engineering treatises were produced and commented upon. This controversy, however interesting to the professional men engaged in it, had very little bearing upon the alleged facts as to the practical effect of the works upon the plaintiff's water supply, but it certainly stirred up an immense amount of professional feeling, especially on the side of the engineers who espoused the departmental cause, who seemed to forget the practical issue which was at stake in their endeavour to vindicate their professional superiority over the opposing witnesses. My client cannot resist the conclusion that the feeling engendered by this professional controversy lies at the root of the disinclination to recognise the justice of his claim.

In addition to the evidence of a theoretical and practical character, which was placed before the jury, the jury had several opportunities of visiting the locality and the works, and of seeing for themselves the various features which had been so frequently referred to by numerous witnesses.

Putting counsel's addresses out of the question, which of necessity were partial in their character, I desire to draw your attention to the summing up of the Chief Judge in Equity, the impartiality of whose attitude is best testified to by the fact that he desired that even his "mere intonation," if it appeared to the jury to favour one side or the other, should be disregarded. That learned Judge told the jury how the issue which they had to try had come to be placed before them. He explained that the Minister for Works had "submitted to pay whatever damages might be assessed in respect of the injury done"; and he added, "upon that submission the Court has directed that these issues should be tried—1st, Whether the plaintiff has sustained any damage in respect to the matters referred to in the order of the 20th March mentioned; 2nd, What is the amount of such damage?" "These issues," he said, "have been referred to you in order that you may inform the mind of the Court by your findings upon them."

After dealing most exhaustively with the mass of engineering evidence referred to, he said, "Of course the first question is whether the plaintiff has suffered damage, and it comes to a question of ascertaining damages. I will ask you to assess them so that if the points of law are decided one way or the other it will not be necessary to go back to a jury. For instance, if the Court were to think that with reference to one part of the claim the plaintiff is not entitled to succeed, the amount you award as to that will be struck out and the remainder stand . . . I want you to answer these questions separately."

"My last word on these matters is that they are entirely for your determination alone."

The

The questions then submitted by His Honor were as follows, to which are appended the answers given to each and all of them by the jury :—

1. Is Shea's Creek natural or artificial? Natural.
2. Is there now as full a supply of water in the channel of Shea's Creek as before the extension and the sewer were constructed? No.
3. Has the work at the extension had the effect of drying the ground to the east of Shea's Creek, between the creek and the extension? Yes.
4. If so, has there been any consequent diminution in the quantity of water going into the dam? Yes.
5. If there is any diminution in the quantity of water, has such diminution had the effect of making the water in the dam less pure? Yes.
6. Has the area of the reed-bed, between the extension and Shea's Creek, been diminished by the works? Yes.
7. If so, has it had the effect of making the water in the dam less pure? Yes.

The damages found in plaintiff's favour were distributed as follows :—

|  |        |
|--|--------|
| 1. Arising from loss of water in the channel of Macdonaldtown Creek and Shea's Creek ..... | £3,000 |
| 2. From loss of storm-water overflowing the banks of these creeks, or either of them ..... | 1,000  |
| 3. The loss of water from diminution of the swamp .....                                    | 4,000  |
| 4. From loss of reed-bed .....   | 2,000  |

His Honor then thanked the jury for their patient attention to the case.

On the 15th June, 1894, the plaintiff gave the defendant notice of his intention to move for a decree upon the findings of the jury, while the defendant gave the plaintiff notice, on the 16th June, of his intention to move for a new trial. The grounds on which the application for a new trial was made to the Chief Judge in Equity were :—

1. That there was no evidence, or not sufficient evidence, that the plaintiff suffered any damage at law.
2. That the findings of the jury were against evidence and the weight of evidence.
3. That the damages were excessive.

Arguments of counsel on these two motions lasted several days, both matters being dealt with together. On the 25th June, arguments of counsel being concluded, the Chief Judge in Equity said, "I uphold and repeat my decision, that all through this case it has been assumed that the defendant is the Minister for Works, acting on behalf of the Crown. \* \* \*

"I have said over and over again that when a Minister is sued he should not be sued in his own name, but as the Minister for Works, or the Attorney-General, as the case may be. \* \* \* Some questions of law might arise if that point were taken at the proper time, but both parties throughout this case, not merely on the trial of the issues, but before the issues were settled, when the injunction was applied for, and in all other proceedings, treated the action as being against the Minister for Works. I allow an amendment by striking out the name of the Honorable Bruce Smith."

He said further, in reference to the propriety of interfering with the finding of the jury :—"If, therefore, the Judge thinks that the matter has not been investigated properly by the jury, he has power to refer it to another jury; in other words, to grant a new trial with much greater latitude than the Court of common law possesses. \* \* \* It appears to me that the true limitations which govern the Court are as follows. \* \* \* If the Judge sees that the question is one of grave doubt—one on which different minds might come to different conclusions; that the facts were all put fairly to the jurors, so that it must be assumed that they fully understood them; that there was no misdirection; and that the Judge properly explained to them the points on which they were to decide, then the Court, directing the issue, would pause before it would order a new trial. These appear to me to be the principles on which the Court should act in determining whether a case is one in which it ought to grant a new trial. \* \* \* However, all these matters were before the jury, and the jury came to the conclusion that the plaintiff's witnesses were right. \* \* \*

"If the verdict of the jury had in every instance to be such a verdict as the Judge himself would have brought, it would be a farce to refer the matter to the jury; it would be much simpler for the Court itself to decide the matter in the first instance. Where it is a matter of doubt, and the whole matter has been fully before the jury, I think the Court ought to refuse to interfere with the verdict. That being the only matter upon which a question of new trial arises, I must dismiss the application for a new trial, with costs."

Again, dealing with the manner in which the issue had come to be submitted to the jury, His Honor made the following observations, and as the facts which these express constitute the kernel, so to speak, of these proceedings, I desire, on behalf of my client, to bring them most prominently under your notice :—"When the defendant applied to the Court to have the injunction dissolved, it was pointed out that the Crown had resumed the land necessary for the construction of the canal, and therefore the plaintiff could not retain the injunction; all he could do was to claim compensation for any injury he had suffered. It was then pointed out that already, owing to the construction of the works, he had suffered great damage, and then counsel for the defendant submitted to pay whatever compensation the plaintiff was entitled to in respect of these works. That is the way the matter comes before me. \* \* \* It arises out of the submission of counsel for the Minister for Works to pay whatever compensation the plaintiff might be held to be entitled to. That also gets over the difficulty which has occurred to me, as to how far the plaintiff, who is only a tenant, can claim for the injury alleged to be done to the land. It appears to me that but for the submission I have just referred to, there might be a question raised on that point. But if there is anything in that point it appears to me to be cured by that submission. \* \* \* I am satisfied that it is necessary for the plaintiff to establish a right for which an action would have lain independently of the statute, before he could show that he was entitled to any compensation."

The last words of the quotation will satisfy you that the plaintiff had been subjected in the Judge's mind to the most rigid test in the proof of the defendant's liability.

In dealing with the four heads of damage under which the jury had distributed the £10,000 (the amount at which they estimated the plaintiff's loss), the Judge disallowed the second, £1,000, the third, £4,000, and the fourth, £2,000 for each of which he practically held the defendant could not be made legally liable; but with regard to the first head, His Honor said "so far as the plaintiff's application is concerned, I think he is entitled to damages to the extent of £3,000, which is the amount the jury have assessed for the loss of water in the channel of Shea's Creek and Macdonaldtown Creek," and he concluded his judgment by saying "I, therefore, make a decree for the plaintiff for £3,000 damages, the defendant to pay the costs of the issues."

I desire now to point out to you, on behalf of my client, that this matter is in the nature of a reference to arbitration, to which your predecessor (Mr. Lyne) voluntarily submitted, as a condition to the plaintiff withdrawing his opposition to the dissolution of the injunction; if the matter had been referred by the parties in the ordinary way to one or more arbitrators, finality would have been provided for by some clause in the reference. Here, however, it must be obvious that by the mere fact of submission to the finding of a jury, whether for better or for worse as regards the result, your predecessor bound himself to accept the conclusion which that jury should arrive at.

If there were any doubt about the matter having been put fairly before the jury, or about the jury having understood the evidence, or if the matter had not been fully gone into on both sides, my client could understand your hesitation to abide by the result; but no such objection can be taken. The Judge himself, one of the ablest upon our Bench, considered that everything that could be done to fully elucidate the questions involved had been done; he himself said that if the Judge thinks that the matter has not been investigated properly by the jury, he has power to refer it to another jury—in other words, to grant a new trial with much greater latitude than the Court of common law possesses. He said, further, "that where it is a matter of doubt and the whole matter has been fully before the jury, I think the Court ought to refuse to interfere with the verdict." As a fact, His Honor refused to grant a new trial, upon the ground that no reason had been shown why such an application should be acceded to, so that the proceedings as a whole show first, the submission of your predecessor to the finding of the jury; second, the finding of the jury; third, the confirmation of that finding by the Judge to the extent of the amount for which he gave judgment.

On behalf of my client, I submit that the rights and dignity of the department have been sufficiently vindicated by the jury, with whom the Judge himself could find no fault, and whose finding has been confirmed by the Judge, one of the ablest and most impartial on our Bench, as a finding which is supported by law.

Allow me to express the hope that after the trouble I have taken to summarise the salient features of this long and wearisome inquiry you will give the above your careful perusal and impartial consideration, and thus perhaps lead to a satisfactory settlement of the whole matter.

In conclusion, I should like to remind you that, although the Chief Judge in Equity, having regard to the strict legal limitations which surround the plaintiff's claim, has reduced the amount of damages to £3,000, the jury themselves, with whom the Judge can find no fault, and to the finding of which your predecessor agreed to submit the case, found that my client had actually suffered damage to the extent of £10,000.

The absence of a legal right for the £7,000 by which the finding of the jury was reduced by the Judge does not alter the fact that the loss has been suffered by the plaintiff, and by no fault of his own. Seeing this, it appears to be reasonable that my client should look upon the £3,000, amount of decree as, after all, only a small compensation for the damage he has suffered by reason of the action of the department.

I have, &c.,  
H. S. WILLIAMS.

Acknowledged.—J.B., 30/10/94. Before dealing with this the Minister will be obliged if the Crown Solicitor will kindly give him the benefit of his views on the statements made herein.—J.B., 30/10/94.

No. 41.

The Crown Solicitor to The Under Secretary for Public Works.

Macnamara v. The Minister for Works.

Sir,

Crown Solicitor's Office, Sydney, 13 November, 1894.

I have the honor to acknowledge the receipt of your B.C. communication of the 30th ultimo, forwarding a letter from Mr. Williams, solicitor for the plaintiff in this suit, purporting to be a summary of the facts in this case, and requesting to be furnished with my opinion thereon.

After a careful perusal of the letter it seems to me to have been written, and naturally so, entirely from the plaintiff's point of view of the case. Although it cannot quite be said that it amounts to a misstatement of the facts, it certainly does contain a very garbled interpretation of the merits of the case.

I disagree entirely with Mr. Williams in his allegation that the department's officers are influenced by partisanship. On the contrary, I must state that in my opinion the verdict in this case was, to use the words of Mr. Pilcher, Q.C., "a wicked verdict." Had the matter been fought out between private parties, I have not the slightest hesitation in saying that the plaintiff would not have been awarded by any impartial jury one farthing's damages; but in the unfortunate state of things which exists it is, as I have before pointed out, almost impossible to obtain a verdict where the Government is defendant.

Much stress is laid by the plaintiff upon the fact that the Minister consented, by his counsel, to pay any damages that may have been incurred by the plaintiff, but this only amounted to a consent to pay any legal damages which he could have recovered by any other proceedings, and not, as in this case, damages which, as the defendant contends, he had not incurred, nor for which he had no right to claim compensation, he not being the owner of the land.

Mr. Williams' statement of the facts is in the main correct, if the incorrect construction put upon them is disregarded, but they are all contained in a very clear manner in the Appeal Book, of which the Minister has a copy.

I may state, however, that the contention as to the method of gauging adopted by the plaintiff's and defendant's witnesses respectively was not immaterial, as Mr. Williams suggests, but, on the contrary, was most important, as going to show the primitive and utterly unreliable way in which the plaintiff's expert witnesses attempted to support their evidence. For the time taken up by this controversy the plaintiff's leading counsel is chiefly responsible, as indeed he was for the greater part of the time absolutely wasted in the case, and I submit that any impartial person, upon perusal of the evidence as to the method of gauging adopted by the plaintiff's and the defendant's witnesses respectively, could not but be convinced that the latter's method was the correct one, and consequently that the evidence upon the loss of water in Shea's and Macdonaldtown Creeks, the only items upon which the plaintiff could recover, falls to the ground, and the verdict should have gone to the defendant, and I am of opinion, upon a careful perusal of the summing up, that this was also the opinion of the Judge, but he was reluctant to interfere with the finding of the jury, who had had the same facilities of hearing the evidence as he had, and should have been able to come to a correct conclusion upon the same, and as you are aware, from seeing the grounds of the appeal, the contention of the defendant is that the Judge should have disregarded entirely the verdict of the jury, opposed as it was to the evidence and the weight of evidence, and given a verdict for the defendant; and this view I think—and I am strongly supported by the defendant's counsel—to be the correct one.

As to the evidence given by Mr. Moore, the manager for Messrs. Harrison, Jones, and Devlin, I can only say it is not in any way correct that his evidence was "practically uncontradicted." On the contrary, the evidence of Mr. Hawksworth, the wool-expert of the Hawkesbury Agricultural College, went wholly to contradict it, and I may add that conclusive evidence in support of Mr. Hawksworth, and in flat contradiction of Mr. Moore, could have been given by one of the most eminent experts in Sydney had he not been unwilling to give it, and in fact refused to go into the box and attest to what he had previously told my clerk, owing to the fact, I presume, that the plaintiff is one of the largest wool suppliers in Sydney, and he did not wish to run counter to him. The fact that Messrs. Harrison, Jones, and Devlin are the sole agents for Mr. Macnamara also greatly tends to prejudice the evidence given by Mr. Moore.

In conclusion, though I do not wish to be too diffusive on this matter, I feel it my duty to say, in reply to Mr. Williams' most unwarrantable assertion with regard to the evidence given by the Government officers and the defendant's professional witnesses that their evidence was given in the fairest possible manner, and that the statement "that the professional feeling stirred up by the controversy as to the gauging is at the root of their disinclination to recognise the justice of the plaintiff's claim" is as unjust as it is untrue. In my opinion, their views of the case were not warped in the slightest degree, and the evidence given by them conclusively proves that the case got up by the plaintiff was purely a try-on, and it should be resisted to the utmost.

A perusal of the Appeal Book will, I am sure, bear out the view which I have taken of the case, and in which, as before mentioned, counsel for the defendant heartily concurs.

I return Mr. Williams' letter herewith.

I have, &c.,  
GEO. COLQUHOUN,  
Crown Solicitor.

Submitted.—J.B., 14/11/94. Forwarded for the perusal of my hon. colleague, the Premier.—J.H.Y., 14/11/94.  
Under Secretary, Finance and Trade.—J.B., B.C., 14/11/94. Seen.—G.H.R., 19/11/94. Return to the Public Works  
Dept.—G.H.R., 19/11/94. The Under Secretary for Public Works.—F.K., 19/11/94. Shall any reply be sent to Mr.  
S. H. Williams?—J.B., 20/11/94. Not at present.—J.H.Y., 20/11/94.

No. 42.

Précis.

MACNAMARA v. THE MINISTER FOR WORKS.

THIS suit was commenced on the 27th April, 1889, by the plaintiff, Henry Macnamara, filing a statement of claim in equity against "The Honorable Bruce Smith, Minister for Works, defendant," asking for an injunction to restrain the defendant from diverting the water from Shea's Creek, so as to prevent same from flowing on the plaintiff's land and from continuing the canal so as to diminish the flow of water on the said land. (*See Statement of Claim, Appeal Book, p. V.*)

The defendant appeared to this Statement of Claim, but owing to the fact that the Government of the day was not in a pecuniary position to go on with the works, and accordingly had no objection to the injunction going, the defendant, by his counsel, Mr. A. H. Simpson, consented to the injunction, leave being reserved to the defendant to come in at any time and apply to have same dissolved, and an order to that effect was accordingly made on 30th of April, 1889. (*See Order for Injunction, Appeal Book, p. VII.*)

The matter rested here till 27th February, 1894, when the then Minister, Mr. Lyne, wished to go on with the work, and applied to have the injunction dissolved. On the argument on the matter it was contended by the plaintiff that much damage had already been done to his property by the canal, and that the Government had, in spite of the injunction, gone on with the canal, which had had the effect of diverting the water from Shea's Creek, from which he got his water supply.

The



The plaintiff was a monthly tenant of the Cooper Estate, under lease from Mr. J. R. Hill, and carried on a wool-washing establishment at Shea's Creek. Mr. A. H. Simpson, counsel for the defendant, said that the land having been resumed since the order for the injunction was made that injunction must inevitably be dissolved, but the defendant was willing to pay any damages that might have been done to the land. An order, dated 20th March, 1894, was accordingly made by consent dissolving the injunction (*see Appeal Book, p. 9*), "the Minister for Works, by his counsel, submitting to pay any damages that may be assessed in respect of any injury done to the plaintiff by the works at Shea's Creek, previously to the resumption of the land in the *Gazette* on the 6th day of March instant," and the assessment of the damages was set down for 14th May, before the Chief Judge in Equity and a jury of four. The issues fixed were—(1) Whether the plaintiff had suffered damages by reason of the matters in the order of 24th March mentioned; (2) and, if so, what is the amount of such damages.

The plaintiff filed particulars of claim (*see Appeal Book, p. 10*), amounting to £13,614 14s. 7d., claiming for depreciation in wool for damage to skins on account of impure water and for loss of water caused by the canal and incidental expenses and interest.

The case duly came on for hearing on 14th May, and the taking of evidence lasted till 14th June, when an immense amount of evidence was taken on both sides. The case for the plaintiff, shortly, was that the digging of the canal had had the effect of draining off the water from Shea's Creek and from a swamp from both of which he got his supply, and to prove this he brought expert witnesses to prove that a canal would have this effect—that Shea's Creek was a natural water-course—to gauge the flow of the water, and to speak as to the nature of the ground which was peat and, as he averred, extremely porous. He also brought forward old residents, who spoke to the former bountiful supply of water, and his wool agents to prove the loss of wool, &c.

The defendant's evidence consisted mainly of levels which were taken at different times before the statement of claim was filed, and at the present time, and which showed that the land through which Shea's Creek ran was higher than that where the canal was situated, and, therefore, the making of the canal could not have the effect of draining the supply of water of Shea's Creek. That the soil was very retentive of water—that by different gaugings taken it was clear no water could have been lost—that the evidence of damage was unsatisfactory—that the water was still adapted for wool-washing—that Shea's Creek itself was an artificial channel. A great deal of time was taken up by a controversy as to the different methods of gauging adopted by the plaintiff's and defendant's witnesses. The former using the float and velocity method—the latter the weir method. On 14th June, his Honor summed up to the jury. The tendency of this summing-up was in favour of the defendant, but a verdict was returned for the plaintiff in the sum of £10,000 made up as follows:—

1. Arising from loss of water in the channel of Macdonaldtown Creek and Shea's Creek, £3,000.
2. From loss of stormwater overflowing the banks of these Creeks or either of them, £1,000.
3. The loss of water from diminution of the swamp, £4,000.
4. From loss of reed-bed, £2,000.

On 16th June, 1894, the defendant filed a motion for new trial (*Appeal Book, p. 486*), and the suit was set down for further consideration.

On 25th June his Honor made an order that the pleading should be amended by striking out the name of the Honorable Bruce Smith (*see Order Appeal Book, p. 500*), thus leaving the Minister for Works defendant. He also dismissed the application for the new trial (*Appeal Book, p. 499*), and made a decree reducing the verdict to £3,000 (*Appeal Book, p. 500*), holding that the plaintiff could not recover under items 2, 3, and 4, the defendant to pay the cost of the issues, *i.e.* all the issues. From this judgment the defendant filed notice of appeal to the Full Court on the 9th July, 1894 (*see Appeal Book, pp. 3, 5*). The defendant all through the suit having been treated by the Equity Judge as being in reality the Crown, and the pleadings amended with that object it was thought that no security for appeal need be given, the Crown being the appellant and such was accordingly not given, but the other requirements of the 14th section of the Equity Act were complied with.

No written opinion as to the advisability of appealing was given by the defendant's counsel, Mr. Pilcher, Q.C., and Mr. Garland, but the notice of appeal was lodged as a matter of course, both counsel being greatly dissatisfied with the verdict, and strongly advising an appeal. Mr. Pilcher in particular characterised the verdict as a monstrous one, and in several consultations which we had with him he expressed the opinion that the defendant would succeed on the appeal. Sir Julian Salomons and Mr. A. H. Simpson, who were briefed on the appeal, also gave opinions in consultation that the defendant had a good chance of succeeding, but Sir Julian was not as confident as the other counsel.

On the motion for appeal coming on before the Full Court, on the 14th August, the Court refused the same, with costs, they being of opinion that the defendant should have given the security required by the Equity Act. The Court said that in this case the defendant was not the Crown, as the proceedings had not been properly instituted in the first instance under the claims against the Colonial Government Act, and no submission to pay by counsel could make the Crown liable, nor had the Judge any power to make an order to that effect. The verdict was, therefore, against the Minister for Works as such, and he should accordingly have lodged a security.

As the case now stands, therefore, it is submitted that plaintiff cannot recover anything unless the Government thinks fit to pay, and his verdict is practically useless to him. A final order for leave to appeal to the Privy Council from the judgment of the Full Court was obtained on the 13th November instant, and the transcript is now being prepared.

The plaintiff lodged no notice of appeal against the reduction of the verdict to £3,000.

It has been suggested by counsel (Sir Julian and Mr. Pilcher) that instructions should be given to the home agent of the Crown that if the appeal is dismissed on the point of security a petition should then be filed for leave to appeal direct to the Privy Council on the merits of the case.

The evidence given at the hearing was of such immense length that it is impossible to give even a summary of the same without covering many pages of foolscap, but it may be shortly stated that the evidence for the plaintiff was, for the most part, flatly contradicted by the witnesses for the defendant, and the case resolves itself simply into the question as to which side the jury should have believed.

Counsel for the defendant impressed upon the Judge that the Jury were only there to satisfy the conscience of the Court, and if he was not satisfied in every particular with their verdict he should disregard it, and give a decree accordingly. His Honor, however, held that such a state of the law would make the presence of a jury useless, and the only ground upon which a Judge could disregard their verdict would be if it was clearly and demonstrably wrong, being the same principle as that upon which the Court will grant a new trial at Common Law.

The fact of the Judge not having seen fit to find a decree for the defendant appears to be the strongest argument against the appeal.

A perusal of the grounds of appeal on page 3 of the Appeal Book, and of His Honor's summing up on page 469, and judgment, page 490, will show more fully the chances of success or otherwise of the appeal.

I may also add that immediately after the judgment of the Full Court was delivered, dismissing the appeal for want of security, a consultation was held with the Crown counsel, Sir Julian Salomons, Mr. Pilcher, Mr. A. H. Simpson, and Mr. Garland, when they all expressed a strong opinion that an appeal to the Privy Council upon the point of the security would be upheld, but that at any rate if such appeal was dismissed the Privy Council would certainly, owing to the peculiar position and the importance of the case, entertain an application for special leave to appeal upon the merits of the case from Mr. Justice Owen's judgment. It might be mentioned that when the matter was before the Full Court Sir Julian during the argument pointed out to the Judges the peculiar position in which the case would be left if they gave the judgment before mentioned, and the Chief Justice, I think it was, incidentally mentioned that he did not think the Privy Council would refuse an application for special leave to appeal if the circumstances of the case were pointed out to them.

It is unfortunate that the Equity Act does not provide for an extension of time for payment of security in special cases, but in the recent case, *Rodd v. Municipality of Hamilton, S.C.W.N.*, vol. x, p. 91, where the bond was filed a day late, the Court held that they had no power, however much they might wish to do so, to entertain the appeal, the Act having taken the matter out of their hands. I do not think there would be any difficulty in getting the other side to consent to waive the point of the security, seeing that it is to their interest to get the appeal heard, and allow the Full Court here to decide the appeal if the Court would do so, and a suggestion to this effect was thrown out by Mr. Langer Owen, counsel for the plaintiff, after the judgment of the Full Court had been delivered, but pending the proposals for a settlement the matter had not yet been definitely settled.

The plaintiff's taxed costs of the issues would probably amount to £2,500, as fully £1,500 were incurred for counsel's fees, and the witnesses' expenses were very heavy.

Costs of the appeal on the point of security should not amount to more than £300, as to save expense the transcript is being prepared by my office and the department.

But see memo. of Crown Solicitor of 3rd December, 1894, post, as to Privy Council appeal. G.B.S., 17/12/94.

See memo. of Crown Solicitor of 3rd December, 1894, post. G.B.S., 17/12/94.

Interlocutory

Interlocutory costs, amounting to £107 12s., have already been taxed (under protest), but the plaintiff has not brought in his bill for the cost of the issues.

The interlocutory costs were for the costs of having the injunction dissolved, which, of course, had to be paid by the defendant (£92 0s. 6d.), and the costs of an application by the defendant for further and better particulars of plaintiff's claim, which was dismissed with costs (£15 11s. 6d.)

The question as to whether or not an appeal should be made direct to the Privy Council, supposing that the Crown's appeal upon the point of security is not dismissed, was not discussed with counsel. It was presumed that the appeal would be relegated to this Court.

An appeal could, of course, be made direct to the Privy Council, but it would, I think, have to be done by special petition. The 79th section of the Equity Act of 1880 shows that an appeal may be taken direct, and this has been acted upon (see notes to section 79 in Walker and Rich's Equity Practice, page 91).

I cannot say whether or not the Court here could or would adopt the course suggested by Mr. Langer Owen, viz., if the other side waived the question of security, and consented to the appeal being heard, the appeal might be heard by our Supreme Court sitting as an Appeal Court. The Court might be induced to do this, but my own opinion is that our Court has no power to hear the appeal in the manner indicated.

See Crown  
Solicitor's  
memo., 3/12/94,  
post.—G. B. S.

Sir Julian Salomons, Mr. Pilcher, Q.C., Mr. A. H. Simpson, and Mr. Garland all advised that the Crown have a good chance of succeeding if the Supreme Court will entertain the appeal, but Sir Julian was not so confident as the other counsel.

All the above counsel have advised that the Crown ought to succeed on the question of security before the Privy Council.

No express opinion was obtained as to the chances of success before the Privy Council upon the merits, but it is presumed that if the Crown has a good chance on the appeal here, it would have the same before the Privy Council.

The whole amount of fees paid out of pocket up to date is as follows:—

|  | £           | s. | d. |
|--|-------------|----|----|
| Counsels' fees.....  | 1,201       | 0  | 6  |
| Shorthand notes, half cost .....                                   | 258         | 4  | 9  |
| Typewriting, copying Judge's notes, and other small expenses ..... | 18          | 8  | 1  |
| Jurors' fees .....   | 48          | 6  | 0  |
| Cost of transcript .....   | 20          | 0  | 0  |
|  | £1,545 19 4 |    |    |

£300 has also been paid into Court as security for costs, which will be paid out if the Crown succeeds before the Privy Council.

The above sum includes the briefs delivered on the appeal before the Full Court, which, of course, has not been heard. It must be borne in mind that, in addition to the sum of £1,545 19s. 4d., the department has had to pay heavy costs for payment of expert witnesses, but the amount I cannot state, as the payment did not come through this office.

Amended précis  
submitted,  
28/1/94.—GEO.  
COLQUHOUN, C.S.

I am unable to give very exact particulars of the different costs, as the bills are not made up in this office until the Crown is successful, and they have to be prepared for taxation.

A perusal of

of 26th October, and my report thereon of 13th November, is suggested.

GEO. COLQUHOUN.

The costs of the appeal to the Privy Council upon the point of the security should not amount to more than £200 for each party.

The costs of an appeal to the Privy Council direct upon the merits from the judgment of Mr. Justice Owen, supposing that the appeal on the point of security is dismissed, would be about £500 for each party.

Having attended a consultation in the presence of the Attorney-General, and between him and Sir Julian Salomons, Mr. A. H. Simpson, and Mr. Garland, I find that my impression of the opinions of the different Crown counsel, expressed in the first paragraph of page 7, requires some modification.

Mr. A. H. Simpson does not think that the Crown would succeed before the Privy Council on the point of security, he being of opinion that the Crown ought to give security, but Sir Julian Salomons and Mr. Garland think the Crown has a fair chance of success.

Mr. Pilcher has expressed a very strong opinion that the Crown will succeed.

All the counsel agree that the Full Court were wrong in holding that the Minister for Works was not the Crown.

Mr. A. H. Simpson is also doubtful that the Privy Council would grant special leave to appeal direct to them upon the merits, if the appeal on the question of the security is dismissed, but the other counsel are of opinion that such leave would probably be granted.

GEO. COLQUHOUN,  
Crown Solicitor.

3rd December, 1894.

**Appendix No. 77.**  
PAPERS—CONTRACT No. 79A.

No. 1.

E. M. Clark, Esq., M.P., to The Under Secretary for Public Works.

Sir,

Legislative Assembly, N.S.W., Sydney, 6 March, 1894.

As the portion of the North Shore sewerage works contained on Messrs. Carter & Co.'s contract is now nearly completed, I desire to bring under the notice of the Minister for Works that this work will be perfectly useless until that portion connecting Milson's Point, at Jeffrey-street, is completed, and to urge upon him the necessity for at once carrying out this part of the work. I may point out that it will serve a very large population, besides assisting to get rid of the offensive matter now finding its way into the harbour through the storm-water sewer at Careening Cove and other places becoming more offensive every day, and a source of very numerous complaints. I understand that Messrs. Carter & Co., having the plant, would be able to carry out this work on very advantageous terms, to provide work for a large number of men now employed on their present works, who will otherwise be thrown on an overcrowded labour market by the completion of their present contract. As this work is absolutely necessary to the completion of the North Shore sewerage scheme, I would urge its being put in hand at once.

Yours, &c.,  
EDWARD M. CLARK.

Commissioner for Roads,—D. McL. (for U.S.), B.C., 7/3/94. For report.—R.R.P.H., 9/3/94. Report here with.—O. BAGGE, 15/3/94.

No. 2.

The Principal Assistant Engineer to The Engineer-in-Chief for Sewerage.

Necessity for doing that portion of the North Shore Sewerage Works which connects Milson's Point at Jeffrey-street. THE present contract, No. 79, comprising a length of 1 mile 25·3 chains of the main North Shore outfall sewer from Willoughby Bay to junction of Alfred and Mount Streets is the first section of the North Shore sewerage works.

The second section should be the "Outlet Works," and the third section, which might be proceeded with simultaneously with the outlet works, would be the extension of the main outfall sewer now asked for, from junction of Alfred and Mount Streets southwards to the junction of Campbell and Jeffrey Streets, being (including some minor branches) a total length of about 76·90 chains.

By way of comparison, I have prepared an office estimate of the cost of this extension, according to present prices, amounting, as per detail statement attached, approximately to £12,831 19s. 6d., and an estimate of the same work in accordance with the contract prices of Contract No. 79 of the main outfall sewer in progress, which, as per detail statement attached, amounts approximately to £16,307 17s. 8d.

The detail plans of the outlet works are unavoidably very intricate, and it will take at least another month (if no other works come between) to complete the quantities.

The designs of the main outfall sewer extension between Mount and Jeffrey Streets, excepting general plan and section, have not yet been commenced.

15 March, 1894.

C. H. O. BAGGE.  
There



There is no reason why this extension should not be gone on with at once; I cannot, however, see my way to recommend that it be carried out as an extension of the existing contract, which at schedule rates would amount to £16,307 17s. 8d., whereas the office estimate is £12,831 19s. 6d. The greater part of this difference lies in one item—"excavations in shafts"—which in present contract, owing to their great depth, carries a very high price, viz., 78s. per cubic yard. This Messrs. Carter & Co. are prepared to reduce to 40s. per cubic yard, which would reduce the total cost to £13,700, or about £1,000 above the office estimate. I believe, however, if tenders were invited, we could get the work done under the office estimate.—R.R.P.H., 22/3/94. Under Secretary. Submitted.—J.B., 28/3/94.

Referring to the Minister's intimation this morning that he was prepared to let Messrs. Carter & Co. carry out this work as an extension of their present contract, provided they agreed to do so for the departmental estimate of £12,831 19s. 6d., no claims whatsoever to be made for extras, and all payments to be made at the allowed schedule rates, I have had an interview with Mr. Carter, who is prepared on the part of his firm to comply with the Minister's decision. Submitted for formal approval.—R.R.P.H., 29/3/94. For approval.—J.B., 30/3/94. Approved.—W.J.L., 30/3/94. Accept.—J.B., 30/3/94.

## No. 3.

## OFFICE ESTIMATE.

Proposed Contract No. 79, extension from Mount-street to Junction of Campbell and Jeffrey Streets, with branches.

SCHEDULE of quantities and prices for constructing and completing 76-90 chains, more or less, of the main outfall sewer extension, North Shore, branch and pipe sewers, shafts, junctions, &c., subject to omissions, extras, extensions, additions, enlargements, deviations, or alterations, as provided by the conditions of contract.

The quantities in this schedule are not guaranteed as correct, but are merely given for the guidance of intending contractors, this being a schedule of Prices Contract.

| No. of Item. | Description of Works.  | Unit.       | Probable Quantity. | Rate. | Amount.          |
|--------------|--|-------------|--------------------|-------|------------------|
|              | Excavation in tunnels, in hard rock, for sewer, branches, pipe-sewers, junctions, curves, &c., as specified in clauses 38, 42, 45, 48 to 68, including subducts, timbering, unwatering, and removing the excavated materials beyond actual site of works, as viz. :—                         |             |                    |       | £ s. d.          |
| 1            | Excavation in hard rock, where gadding only is permitted.....  | cubic yard  | 305                | 72/-  | 1,098 0 0 — 63/- |
| 2            | Excavation in hard rock, where charges of powder 2 inches in length by 1½ inch in diameter, and such depths of bore-holes as shall be directed only are permitted .....  | "           | 305                | 63/-  | 960 15 0 — 61/-  |
| 3            | Excavation in hard rock, where charges of powder 4 inches in length by 1½ inch in diameter, and such depth of boreholes as shall be directed only are permitted .....  | "           | 1,220              | 55/-  | 3,355 0 0 — 60/- |
|              | Excavation in shafts, shaft-chambers, and sumps, as specified in clauses 39, 52, 53, 71, and 72, including timbering, unwatering, and removing the excavated materials beyond actual site of works, as viz. :—   |             |                    |       |                  |
| 4            | Excavation in road surfaces, sand, soil, clay, pipeclay, shale, and soft rock only .....   | "           | 50                 | 6/-   | 15 0 0 — 78/-    |
| 5            | Excavation in hard rock, where gadding only is permitted.....  | "           | 160                | 40/-  | 320 0 0 — 83/-   |
| 6            | Excavation in hard rock, where charges of powder 2 inches in length by 1½ inch in diameter, and such depths of boreholes as shall be directed only are permitted.....  | "           | 200                | 34/6  | 345 0 0 — 79/-   |
| 7            | Excavation in hard rock, where charges of powder 4 inches in length by 1½ inch in diameter, and such depths of boreholes as shall be directed only are permitted .....   | "           | 940                | 30/-  | 1,410 0 0 — 78/- |
| 8            | Filling in round brick and concrete work of ventilating and intercepting shafts and chambers, manholes, and into all shafts as specified in clauses 40, 41, 42, 43, 71, and 72, including withdrawing of timber, depositing in layers, replacing road and other surfaces, ramming, &c.....   | "           | 780                | 1/3   | 48 15 0 — 1/-    |
| 9            | Timber ordered in writing to be left in tunnels, shafts, as specified in clauses 36 and 37, including all iron used in fixing same .....   | cubic foot  | 700                | 2/-   | 70 0 0 — -/1     |
| 10           | Subduct in hard rock, with tile covers, as specified in clauses 76 and 77  | lineal yard | 67                 | 3/6   | 11 14 6 — -/1    |
|              | Subduct, as specified in clauses 76 and 78, in more or less hard material, including dry or cement jointing for stoneware pipes, &c. :—  |             |                    |       |                  |
| 11           | Of 6-inch internal diameter .....  | "           | .....              | ...   | .....            |
| 12           | Of 9-inch internal diameter .....  | "           | .....              | ...   | .....            |
|              | Subduct in water-charged loose ground, as specified in clause 76, including hardwood boxes with packing in same, and dry or cement jointing for pipes of :—  |             |                    |       |                  |
| 13           | 6-inch internal diameter .....   | "           | .....              | ...   | .....            |
| 14           | 9-inch internal diameter .....   | "           | .....              | ...   | .....            |
| 15           | 10-inch internal diameter .....  | "           | .....              | ...   | .....            |
| 16           | Hand-packed stone-filling, 4-inch gauge, as specified in clauses 17, 69, 76 to 78, over subducts, and, when ordered, round sewers and pipe-sewers in tunnels, including depositing, packing, and ramming .....   | cubic yard  | 405                | 4/-   | 81 0 0 — -/-     |
| 17           | Sandstone concrete, any shape, form, or thickness, in shafts, tunnels, sumps, round stoneware pipes, and where ordered in any situation in the construction of these works, as specified in clauses 26, 27, 93 to 109, including washing dry surfaces, wetting, and grouting, complete ..... | "           | 405                | 30/-  | 510 0 0 — 37/6   |
| 18           | Bluestone concrete, any shape, form, thickness, arched, circular or otherwise, in sewer, curved junctions, arches, manholes, &c., as specified in clauses 24, 27, 93 to 109, including washing dry surfaces, wetting, and grouting, complete .....   | "           | 900                | 50/-  | 2,250 0 0 — 56/- |
|              | Brickwork in cement in sewer, junctions, shaft-chambers, circular, curved, arched, or otherwise, any shape or form or thickness, as specified in clauses 110 to 113, including wetting, flushing, grouting, collar-joints, pointing, where ordered, &c. :—                                   |             |                    |       |                  |
| 19           | Of one ring or portion of ring.....  | "           | 260                | 60/-  | 780 0 0 — 50/-   |
| 20           | Of two or more rings, straight, arched, &c. ....   | "           | .....              | ...   | .....            |
| 21           | Cement facing in two thicknesses, ½ inch thick when finished, as specified in clause 114, to all internal (and external, where ordered) surfaces of sewer, junctions, shaft-chambers, culverts, manholes, and where ordered in any situation in the construction of these works .....        | square yard | 3,000              | 2/6   | 375 0 0 — 2/1    |

| No of Item                  | Description of Works  | Unit.       | Probable Quantity | Rate. | Amount           |
|-----------------------------|---|-------------|-------------------|-------|------------------|
| 22                          | Bluestone concrete, any shape, form, or thickness, arched, circular, or otherwise, in shafts, over shaft-chambers, as specified in clauses 93 to 109, including washing dry surfaces, wetting, and grouting, complete .....   | cubic yard  | 40                | 50/-  | £ 100 0 0 — 60/- |
| 23                          | Brickwork in cement, circular, arched, curved, or otherwise, any shape, form, or thickness, as specified in clauses 110 to 113, in shafts, over shaft-chambers, including wetting, flushing, grouting, pointing where ordered, collar-joints, &c, complete ..   | "           | 280               | 60/-  | 840 0 0 — 65/-   |
| 24                          | Cement facing in two thicknesses $\frac{3}{8}$ inch thick when finished, to all internal and external surfaces of shafts, where ordered, as specified in clause 114 .....   | square yard | 50                | 2/6   | 6 5 0 — 2/-      |
| 25                          | Plymouth sandstone ashlar, set in cement on top of ventilating shafts and where ordered, as specified in clauses 16 and 115, complete ..  | cubic foot  | .....             | ...   | .....            |
| 26                          | Squared bluestone pitchers, 9 inches deep, set in sand, round cast-iron ventilating grates of shafts, where ordered, as specified in clause 116, complete .....   | square yard | .....             | ...   | .....            |
|                             | Providing, laying, and jointing glazed stoneware, plain pipes, in trenches, and where ordered, including fixing discs, as specified, and including bed joints, in mortar, where required —  |             |                   |       |                  |
| 27                          | 12 inch diameter .....  | lineal foot | 450               | 3/-   | 67 10 0 — 3/-    |
| 28                          | 9-inch diameter .....   | "           | 850               | 2/-   | 35 0 0 — 2/-     |
| <b>SURPLUS MATERIALS.</b>   |   |             |                   |       |                  |
|                             | Removal of surplus materials from the various excavations throughout this Contract, as tunnels and open trenches, including subducts shafts, sumps, &c, as specified in clauses 40, 42, 43, and 45, as viz —  |             |                   |       |                  |
| 29                          | For the first half-mile of lead .....   | cubic yard  | 2,400             | 1/-   | 120 0 0 — 1/-    |
| 30                          | For every further quarter of a mile of lead .....   | "           | ..                | ..    | .. .. .          |
| <b>GOVERNMENT PROPERTY.</b> |   |             |                   |       |                  |
| 31                          | Placing, building in, fixing, and jointing only, any metal work, as cast iron oval and circular pipes, junctions, branches, flanged, and with spigot and faucet ends, gas-checks, ventilating grates, lamp-hole boxes, manhole-covers, staples, step irons, earthenware covers &c, supplied by the Government, including carriage, as specified in clauses 91, 121, 131 to 133 complete ..... | ton         | 11                | 60/-  | 33 0 0 — 60/-    |
| 32                          | Closing of branch sewers and intercepting pipes with earthenware or cast iron covers, set in cement, labour only, as specified in clause 131, complete .....  | each        | .....             | ...   | .....            |
| 33                          | Trapped junction blocks, taking delivery of, and building in .....  | "           | ...               | ...   | .....            |
| <b>GENERAL.</b>             |   |             |                   |       |                  |
| 34                          | Permanent puddle where ordered in any situation in the construction of these works (temporary puddle ordered for purposes of execution of work not to be paid for), as specified in clause 29, including spreading in 9-inch layers, and ramming, complete .....  | cubic yard  | .....             | ...   | .....            |
| 35                          | Special bluestone concrete, as specified in clause 25, where ordered in any situation, in the construction of the works .....   | "           | ...               | ...   | .....            |
| 36                          | Bluestone metal (clause 18), 1 $\frac{1}{2}$ -inch gauge, stacked .....   | "           | ...               | ...   | .....            |
| 37                          | Sandstone metal (clause 26), 2 $\frac{1}{2}$ inch gauge, stacked .....  | "           | ...               | ...   | .....            |
| 38                          | Bluestone metal (clause 32), 2 $\frac{1}{2}$ inch gauge, stacked .....  | "           | ...               | ...   | .....            |
| 39                          | Sharp, clean-washed sand (clause 19) stacked .....  | "           | ...               | ...   | .....            |
| 40                          | Sawn hardwood, in scantlings or planks (clause 30) .....  | cubic foot  | .....             | ...   | .....            |
| 41                          | Oregon timber, in scantlings or planks .....  | "           | .....             | ...   | .....            |
| 42                          | Wrought-iron in bolts, galvanised step-irons, screws, nails, spikes, straps, &c. (clause 31) .....  | cwt.        | .....             | ...   | .....            |
| 43                          | Portland cement .....   | cask        | .....             | ...   | .....            |
| 44                          | Artisan or mechanic, supplied by Contractor .....   | day         | ...               | ...   | .....            |
| 45                          | Quarryman or other skilled labourer, supplied by contractor ..  | "           | ...               | ...   | .....            |
| 46                          | Ordinary labourer, supplied by Contractor .....   | "           | ...               | ...   | .....            |
| 47                          | Cart, with one horse and driver, supplied by Contractor .....   | "           | ...               | ...   | .....            |
| 48                          | One additional horse, supplied by Contractor .....  | "           | .....             | ..    | .....            |
| <b>MAINTENANCE.</b>         |   |             |                   |       |                  |
| 49                          | Three months' maintenance after formal delivery of works .....  | lump sum    | ...               | ...   | .....            |
|                             | Total .....   | .....       | ..                | ..    | £ 12,831 19 6    |

## NOTES.

1 All work herein enumerated shall be understood as being placed in position where specified and ordered, and in complete working condition, in strict accordance with the specification.

2. The above schedule prices include, in every case, continual maintenance of the works during the whole time of construction, and up to the day of their being formally taken over by the Engineer.

3. Items Nos 31, 32, and 33 to include the cost of conveying the Government property from the contractor's store or field office to the various sites of works along line of main and branch sewers, at manholes, gas-check, and shaft-chamber, &c.

4. Prices for items Nos. 36, 37, 38, 39, 40, 41, 42, and 43 are to be for materials in strict accordance with specification, delivered on the works ready for use, and only the actual net quantities ordered and approved of shall be paid for. In case contractor's prices are considered too high by the Engineer at the time such materials may be required, or if the Contractor fail to deliver such materials at the time required and ordered, then the Engineer shall have the power to supply the same from any other source, and the contractor shall have no claim for loss or compensation on account of the exercise of such power by the Engineer.

5. Prices for items Nos 44, 45, 46, 47, and 48 are to be for such as are able-bodied and efficient. The schedule rates per day are for the day of eight hours. In the event of overtime and night work being ordered, it is to be paid for at 25 per cent. advance on the time rates set down for day-work.

6. The whole of the foregoing prices to include all labour, tools, implements, plant, machinery, shoring, timbering, centering, concrete-boxes, unwatering, dams, fluming, temporary bridges, roads, pumping, gasket filling, diverting water-courses and surface water, diverting and maintaining the traffic along roads crossing over main and pipe sewers, reinstating all road and other surfaces, &c., or any other thing necessary in executing and completing each respective item, in strict accordance with plans and specifications.

## No. 4.

## The Supervising Engineer to The Engineer-in-Chief for Sewerage.

Minute Paper.

*Subject* :—Contract No. 79A, North Sydney. Recommending that 33 feet of the High-street branch be driven in conjunction with this contract.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 22 November, 1894. In constructing the main sewers it is usual, in order to prevent the concrete and brickwork being damaged by blasting, to drive at least 33 feet of tunnel for the branch sewers at the same time as the tunnel for the main sewer is driven.

In the case of High-street, North Sydney, this appears to have been overlooked when the contract drawings were prepared. The cost of driving 33 feet at schedule rates will be £31 12s. 6d., and I recommend that at least this length should be done. J.D.

Approved.—R.P.H., 22/11/94. Mr. Weedon to note.—J.D., 23/11/94. Noted.—S.H.W., 26/11/94. File.—J.D., 26/11/94. Messrs. Carter & Co., 28/11/94. Mr. Weedon to note.—J.D., 28/11/94. Previously noted.—S.H.W. File.—J.D., 30/11/94. What will driving alone cost per chain for High-street Branch at schedule rates, Contract No. 79A?—J.D. The cost of driving alone for sewer 3 ft. 3 in. x 2 ft. 2 in. will be £63 5s. (if 4-inch charges of powder are allowed) per chain.—W.E.A., 21/11/94. Mr. Bagge. The lining is taken at 4½ inches thick, for the excavation, beyond the 3 ft. 3 in. x 2 ft. 2 in. sewer, in rock.—C.H.O.B., 21/11/94. Mr. Davis.

## No. 5.

## The Supervising Engineer to Messrs. Carter &amp; Co.

Gentlemen,

Public Works Department, Sewerage Branch, 28 November, 1894.

Referring to the conversation I had with your Mr. Snodgrass relative to doing a portion of the High-street branch in connection with your sewerage contract No. 79A, and to your offer to drive the same at your schedule price No. 3, I have the honor to inform you that the Engineer-in-Chief has approved of this being done. Will you please proceed with the tunnel for at least 33 feet for a 3 ft. 3 in x 2 ft. 2 in. sewer, allowing for a 5-inch lining.

I have, &amp;c.,

J. DAVIS,

Supervising Engineer for Sewerage.

## No. 6.

## Messrs. Carter &amp; Co. to The Engineer-in-Chief for Sewerage.

Sir,

North Sydney, 10 January, 1895.

Being anxious to complete Contract No. 79A, North Sydney Sewerage, as quickly as possible, we have to ask your permission to drive the tunnel from No. 12 shaft on Contract No. 79 towards shaft No. 13 on Contract No. 79A.

As shaft No. 12 is built up in brickwork, we are willing to excavate 33 feet from the end of the drive from No. 12 by guttering and gadding to remove the risk of damage to completed work.

We are, &amp;c.,

CARTER, GUMMOW, &amp; CO.

Register.—J.D., 12/1/95.

## No. 7.

## The Supervising Engineer to The Engineer-in-Chief for Sewerage.

Minute Paper.

*Subject* :—Contract No. 79A, North Shore Outfall. Contractors write asking that they be allowed to drive from shaft at foot of Mount-street.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 15 January, 1895. THE shaft at the foot of Mount-street, referred to in the contractors' letter, was built under Contract No. 79, and 5 feet of sewer lining was put in on the south side of the shaft. The tunnel was driven 50 feet beyond the lining. The contractors ask that they be allowed to continue the drive from this shaft, and undertake to gutter and gad the first 33 feet. I think the request might be granted, as it will greatly facilitate the completion of Contract No. 79A, conditionally, however, upon the contractors consenting to use no blasting powder in excavating the tunnel until they have driven 99 lineal feet from the south end of the lining, and further undertake to leave the sewer and shaft constructed under Contract No. 79 in the same condition as they are at present. J.D.

Approved.—R.P.H., 16/1/95. Messrs. Carter & Co., 16/1/95. Mr. Weedon to see.—J.D., 16/1/95. Seen.—S.H.W., 17/1/95. Mr. Davis. File.—J.D., 18/1/95.

## No. 8.

## The Engineer-in-Chief for Sewerage to Messrs. Carter &amp; Co.

Gentlemen,

Public Works Department, Sewerage Branch, 16 January, 1895.

In reply to your letter of the 10th instant, asking permission to drive the tunnel from the shaft at the foot of Mount-street, I have the honor to inform you that you may do as you ask, conditionally upon your completing the driving of the tunnel to 99 feet south of the sewer lining without the use of blasting powder, and leave the sewer and shaft constructed under Contract No. 79 in the same condition as they are at present.

I have, &amp;c.,

ROBERT HICKSON,

Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage.

## No. 9.

## Messrs. Carter &amp; Co. to The Supervising Engineer.

Sir,

North Sydney, 1 March, 1895.

Seeing that certain drives on Contract No. 79A, North Sydney Sewerage, will not be completed for some months, and having gathered from a conversation with you that the length along High-street might be completed to advantage at the present time, we hereby offer to complete such work at the present schedule rates for Contract No. 79A.

We are, &amp;c.,

CARTER &amp; CO.

Will Mr. Weedon please let me have tracing and estimate of the High-street branch to open cutting?—J.D., 1/3/95. Mr. Weedon.

## No. 10.

## The Supervising-Engineer to The Engineer-in-Chief for Sewerage.

Minute Paper.

*Subject* :—Contract No. 79A, North Shore—High-street extension.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 12 March, 1895.

THE contractors write offering to construct at their schedule rates for Contract No. 79A, 13 chains of the High-street sub-main.

It seems to me that it will be advisable to have this length of sewer constructed as proposed by the contractors. By doing so one shaft will be saved, which will cost £163, in addition to which it will enable the reticulating sewers for a large district to be proceeded with at an earlier date than they otherwise would be.

Although

Although Contract No. 79A is a lump sum contract, there is a schedule of prices attached thereto, which would apply to the whole of the work comprised in the proposed extension.  
The cost, as per estimate attached, will be about £1,800. The schedule rates are reasonable, and as low as would probably be obtained if tenders were invited.

Recommended.—R. R. P. H., 14/3/95. Will Mr. Davis please see me.—J. B., 15/3/95. Seen.—R. R. P. H., 19/3/95.  
For approval.—J. B., 16/3/95. Approved.—J. H. Y., 18/3/95. Mr. Hickson, B. C., J. B., 18/3/95. Please hand attached letter and tracing to contractors.—J. D., 27/3/95. Mr. Weedon. Accordingly.—S. H. W., 28/3/95. Mr. Davis. File.—J. D., 29/3/95. Mr. Griffith.—J. D., 8/4/95. Seen. See the contractor is informed.—C. D., 11/4/95. Action completed. File.—J. M. S., A. E. in-C., 16/4/95.

## No. 11.

## The Resident-Engineer Weedon to The Supervising-Engineer.

8 March, 1895.

ESTIMATE North Shore Sewerage Extension, High-street branch:—

|                       |  | £    | s.    | d. | £ | s.     | d. |   |
|-----------------------|--|------|-------|----|---|--------|----|---|
| 757 lineal feet ..... | Rock tunnelling complete—4-in. powder ; size of sewer 3 ft. 3 in. x 2 ft. 2 in. ....                   | 36/- | 1,380 | 12 | 0 |        |    |   |
| 100 ,, .....          | Rock tunnelling complete—4-in. powder ; 9-in. dia. pipes .....   | 27/- | 135   | 0  | 0 |        |    |   |
| 90 cubic yards .....  | Shaft excavation.....  | 30/- | 135   | 0  | 0 |        |    |   |
| 60 square yards.....  | Cement facing.....   | 2/6  | 7     | 10 | 0 |        |    |   |
| 13½ cubic yards.....  | Sandstone concrete.....  | 30/- | 20    | 0  | 0 |        |    |   |
| 33 ,, .....           | Bluestone concrete.....  | 60/- | 99    | 0  | 0 |        |    |   |
| 45 ,, .....           | Filling .....  | 1/3  | 2     | 16 | 3 |        |    |   |
| 360 ,, .....          | Surplus material .....   | 1/-  | 18    | 0  | 0 |        |    |   |
| 2 No.....             | Manhole covers (6).....  | 3/-  | 0     | 18 | 0 |        |    |   |
| 1·2 square yards..... | Bluestone setts .....  | 30/- | 1     | 16 | 0 |        |    |   |
|                       |  |      |       |    |   | 1,800  | 12 | 3 |
|                       | Estimated cost of 3 ft. 3 in. x 2 ft. 2 in. sewer complete, between 1 m. 38·028 and 1 m. 51·1,923..... |      |       |    |   | £1,800 | 12 | 3 |

Tracing herewith.

STEPHEN H. WEEDON,  
Resident Engineer.

## No. 12.

## Messrs. Carter &amp; Co. to The Engineer, Board of Water Supply and Sewerage.

North Sydney, 1 July, 1895.

Contract, No. 79A, North Sydney Sewerage.

Sir,

We desire to draw your attention to the fact that the above contract is almost completed, the value of the remaining work not exceeding £1,000 ; which with the sum of £8,514, received by us as progress payments makes a total of £9,514, against our lump sum price of £12,831 19s. 6d, a difference of £3,317 19s. 6d.

You also hold our fixed deposit security of £650 as a guarantee for this work.

Under these circumstances, and seeing that we have been carrying on the contract at a direct loss for some time back, we ask you to be good enough to pay us a sum of £3,000 from the above amount of £3,317 19s. 6d.

Trusting that you will grant our request.

We are, &c.,  
CARTER & CO.

Forwarded to Engineer-in-Chief, Metropolitan Construction.—Mr. Cook could report on this application.—J. M. S., 2/7/95. Mr. Cook informed me about a week ago that he estimated that about £1,800 would complete the works.—MR. SMAL. Bond herewith.—S. A., 25/7/95. This contract, according to the bond, is for a "lump sum" of £12,831 19s. 6d. with a schedule of rates marked G, in which progress payments were to be made. The progress payments made under contract to date of application aggregated £8,514 which is assumed to be on the basis of the above schedule of rates. The District Engineer estimates that the cost of completing the works will be £1,800. The financial statement of the contract stands thus:—

|  | £      | s. | d. | £      | s. | d. |
|--|--------|----|----|--------|----|----|
| 1. Amount of contract "lump sum" ..... | 12,831 | 19 | 6  |        |    |    |
| ,, cash deposit .....                  | 650    | 0  | 0  |        |    |    |
|  |        |    |    | 13,481 | 19 | 6  |
|  |        |    |    |        |    |    |
|  | £      | s. | d. |        |    |    |
| 2. Amount paid to contractor .....     | 8,514  | 0  | 0  |        |    |    |
| Value of work to be completed .....    | 1,800  | 0  | 0  |        |    |    |
|  |        |    |    | 10,314 | 0  | 0  |
|  |        |    |    | £3,167 | 19 | 6  |

Would recommend that £2,000 be advanced to the contractors as a progress payment.—J. M. S., 2/8/95. Engineer-in-Chief, Government Construction Works. Approved.—C. D. Mr. Cook to prepare voucher.—M. S., 6/8/95. Voucher herewith.—M. S. Engineer-in-Chief, 13/8/95. Voucher herewith.—W. E. C., 13/8/95.

## No. 13.

## The Supervising Engineer to The Engineer-in-Chief for Sewerage.

Department of Public Works, Engineer-in-Chief's Office, Sydney, 28 August, 1895.

Minute Paper.

Subject:—Contract 79A, North Sydney Sewerage.

As these works have exceeded the estimated cost, it would be as well to have the papers approving of the extensions in High-street at schedule rates.

T. GRIFFITHS,  
Supervising Engineer, Metropolitan Sewerage Construction.

Mr. Adams.—Obtain and attach papers.—C. D., 28/8/95. I have tried to get these papers from the Works Department, and was told they cannot be found.—S. ADAMS, 28/8/95. The Engineer-in-Chief. Are the papers with the Board? Let me see the contract documents.—C. D., 29/8/95. The Under Secretary, Public Works. Mr. Davis for papers required by Mr. Darley.—Jno. P., 29/8/95. On inquiry I find that the bond referred to was handed over to the Metropolitan Board of Water Supply and Sewerage, with others, on 28/6/95.—T. P., Principal Assistant Engineer, Country Towns Water Supply and Sewerage, 3/9/95. Engineer-in-Chief, Metropolitan Sewerage Construction. As the papers cannot be found we must pass in the voucher without them.—C. D., 5/9/95. Vouchers herewith.—T. G., Supervising Engineer, Metropolitan Sewerage Construction, 7/9/95. Engineer-in-Chief, Metropolitan Sewerage Construction. Voucher for £194 15s. 2d. forwarded to the Treasury on 10/9/95.—S. A.

## No. 14.

## The Supervising Engineer to The Engineer-in-Chief for Sewerage.

## MINUTE PAPER.

*Subject* :—Contract No. 79A, North Sydney. Messrs. Jones and Jones—Further *re* damage to Mr. Foster's property, Broughton-street.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 25 August, 1894.

MESSRS. Jones and Jones' first letter was replied to on the 16th inst. It would appear that the letters crossed.

With reference to the blasting being more severe than when they wrote their first letter, I can only say that on the occasion of our inspection on the 13th inst. one of the tenants stated that there had been an improvement since the Italians had been driving the tunnels.

I scarcely think the letter requires an answer, except an acknowledgment.

J.D.

File.—R.R.P.H., 27/8/94.

## No. 15.

## The Supervising Engineer to The Engineer-in-Chief for Sewerage.

## MINUTE PAPER.

*Subject* :—Contract No. 79A, North Sydney. Alleged damage by blasting to Nos. 1 and 3, "Viola Cottages," Broughton-street.

Department of Public Works, Roads and Bridges and Sewerage Branch, Sydney, 15 August, 1894.

MR. BAGGE and I examined these cottages on Monday last, which it is alleged have been damaged by the blasting in the tunnel running down the street in front of the cottages.

At No. 1 cottage slight cracks were pointed out to us in the plastering under the windows in the front, and a crack in the cornice in the front sitting-room, which had been caused, it was said, by a gas explosion, but the crack had extended, it was stated, since the commencement of the blasting. In the back sitting-room and kitchen there are slight cracks in the ceiling, and in the bedroom off the kitchen a small portion of the ceiling has been down, and had been repaired some time before the commencement of the sewerage works.

The tenant in No. 3 cottage pointed out small cracks in the plastering under the front windows similar to those in No. 1 cottage. The lath and plaster wall in the front sitting-room was cracked, and there were slight cracks in most of the ceilings. In the back bedroom the partition wall was cracked, and about 3 feet by 1 foot of the ceiling in the bedroom off the kitchen had fallen, it was stated, about two weeks ago.

From the careful examination that we made we are decidedly of opinion that the whole of the cracks are old, and have been caused by settlement and shrinkage which usually occurs in lightly built houses of this description, and have not been affected by the blasting. The blasting may have caused the ceiling in the bedroom off the kitchen to fall in cottage No. 1, but even this, judging by the condition of the ceiling, is improbable.

There is no evidence that the property has been injured by the sewerage works.

I attach a draft letter, which might be forwarded to Messrs. Jones and Jones.

J. DAVIS.

I concur with Mr. Davis.—C.H. OHLFSEN BAGGE, 16/8/94. Write.—R.R.P.H., 16/8/94. Messrs. Jones and Jones.—J.D., 16/8/94. Mr. Weedon. Noted.—S.H.W., 25/8/94. Mr. Davis,—I find that I was mistaken *re* having returned the first papers from Jones and Jones; will attend to your instructions in the future.—S.H.W., 25/8/94.

## No. 16.

## Messrs. Jones and Jones to The Secretary, Board of Water Supply and Sewerage.

Sir,

Lincoln's Inn Chambers, 38, Elizabeth-street, Sydney, 3 August, 1894.

We are instructed by Mr. Robert Foster, of Annandale, that owing to the very careless and negligent manner in which the sewers in Broughton-street, St. Leonards, are being executed and constructed, the ceiling in Nos. 1 and 3 of his cottages, known as Avolia Cottages, have come down, the walls cracked, cornices damaged, and the property shaken to its very foundations, whereby he has been considerably injured and damaged. Unless, therefore, such damages be made good, and compensation paid our client for any other loss he may have sustained, with £1 ls. costs, legal proceedings will be instituted against your Board without further notice.

Yours, &c.,

JONES & JONES.

Sewerage Engineer.—W.H., 4/8/94. This refers to works now being constructed by Government Sewerage Branch Engineer.—T.G., 6/8/94. Should be forwarded to Mr. Hickson.—J.M.S., 6/8/94. Secretary. Forward to Engineer-in-Chief for Sewerage, and inform.—W.H., 7/8/94. Informed.—No. 768, of 7/8/94. Engineer-in-Chief for Sewerage, 8/8/94. Mr. Davis for report.—R.R.P.H., 10/8/94.

## No. 17.

## Messrs. Jones and Jones to The Engineer-in-Chief for Sewerage.

*Re* Forster and Metropolitan Board of Water Supply and Sewerage.

Sir,

Lincoln's Inn Chambers, 38, Elizabeth-street, Sydney, 22 August, 1894.

We forward you copy letter sent by us to the Secretary of the Metropolitan Board of Water Supply and Sewerage, who requested us to communicate the contents thereof to you.

Yours, &c.,

JONES & JONES.

Mr. Davis.—R.R.P.H., 23/8/94.

[Copy.]

*Re* Forster and Metropolitan Board of Water Supply and Sewerage.

Sir,

16 August, 1894.

We are in receipt of your letter herein, of the 7th instant, intimating, *inter alia*, that our letter of the 3rd instant had been referred to the Engineer-in-Chief for Sewerage, but beyond that we have heard nothing further of the matter. Our client has called upon us, and has instructed us again to communicate with you, and inform you that since the date of our letter to you the sewerage work complained of has gone on much more negligently and carelessly than heretofore. The outer walls of two of the cottages have thereby been cracked from the foundations to the windows, and thence to the roof, as also the inner partitions of the bedrooms.

We understand that he has remonstrated with the men on the work, most of whom are Italians, without avail. Unless the property be reinstated, and all damages made good at once, and our former demand complied with in other respects, our instructions are to initiate proceedings in the Supreme Court, or otherwise, as counsel may advise.

Yours, &c.,

JONES & JONES.

To Reginald Bloxome, Esq.,

Secretary, Metropolitan Water and Sewerage Board, 341, Pitt-street, Sydney.

Previous papers, 94/1396, Mr. Davis, 10/8/94.—F.C.P., 23/8/94. Let me have papers. Mr. Weedon to return papers as soon as possible after receipt of same.—J.D., 23/8/94. Accordingly.—S.H.W., 25/8/94.

## No. 18.

## The Supervising Engineer for Sewerage to Resident-Engineer Boys.

Department of Public Works, Roads, Bridges, and Sewerage Branch, Sydney, 12 June, 1894.  
 GEORGE GEAR, J. W. Thornton, R. Wakefield, and G. W. Bowen called this morning from Contract No. 79A, to represent that they had been employed on this contract as miners, and that they had not been paid for the last fortnight's wages. It appears that a man named Stoddart had received the pay for the work that these men had been doing, and had left without paying them. They inform me that they have seen Mr. Carter, and that he has refused to pay, and that he merely offered them the retention money—£3 10s.—whereas £20 12s. is due. Will Mr. Boys please make full inquiries, and have the report with me by 9 o'clock to-morrow, as the men are to call again? He had better see Mr. Carter, and tell him I shall be obliged if he will give the necessary information. J.D.

## No. 19.

## Resident-Engineer Boys to The Supervising Engineer for Sewerage.

*Subject:*—George Gear, J. W. Thornton, R. Wakefield, and G. W. Bowen state they have not received last fortnight's pay on this contract for sinking part of shaft at 74·07 ch., Contract 79A.

Department of Public Works, Roads and Bridges and Sewerage Branch, 12 June, 1894.  
 GEORGE GEAR and party made complaint to Mr. Boys at his office that a man named Stoddart had drawn their fortnight's money with his own, and could not be found.

Messrs. Carter & Co. inform me that at the beginning of May, 1894, Stoddart and another started sinking the shaft in Fitzroy-street, at 74·07 chains, and that these two men continued the work until the end of May, 1894, drawing two fortnightly pays.

Stoddart and another then took in three other men to help them, making the arrangement amongst themselves; and these three men made no arrangement with the contractors.

It is the custom on all the shaft and drive work for one man in a gang to go to the contractor's office and receive the pay for all, and divide it with his mates; the contractors do not divide the money unless especially requested to do so. Both the contractors and the men inform me that Stoddart received the money for the last fortnight's work.

The amount of the pay was £13 15s.

I would also mention that Stoddart and one of these men were working together as mates for two or three months on the Western Suburbs Sewerage, sinking Shaft No. 5, for Messrs. Carter, Gummow, & Co.'s present contract.

J. W. T. BOYS.

The department cannot interfere in this case.—R.R.P.H., 13/6/94. Mr. Boys to see.—J.D., 13/6/94.

## Appendix No. 78.

## The Acting Secretary, Australian Gas-light Company, to The Engineer-in-Chief for Sewerage.

Sir, Australian Gas-light Company's Office, Sydney, 13 October, 1894.

I do myself the honor to acknowledge the receipt of your letter of the 12th instant, on the subject of the removal of a 9-inch gas main which crosses the Illawarra Road at its intersection with Addison Road, Marrickville, and to inform you that it shall have attention without unnecessary delay.

I have, &c.,

R. J. LUKEY,  
 Acting Secretary,  
 (per J.W.J.)

## Resident-Engineer Millner to The Supervising Engineer for Sewerage.

Resident Engineer's Office, Arncliffe, 8 October, 1894.

Contract No. 69.—Raising Gas Main at Illawarra and Addison Roads, Marrickville.

THE 9-in. gas main crossing the Illawarra Road, at its junction with Addison Road, will require to be raised as per accompanying tracing. W. J. MILLNER.

This was shown to be raised in contract drawings. The Gas Company might be instructed to do the work.—J. D., 9/10/94. Commissioner and Engineer-in-Chief for Roads, Bridges, and Sewerage. Write.—R.H., 10/10/94. Mr. Davis.—Australian Gas Company, 11/10/94. Mr. Millner to see.—J.D., 12/10/94. Seen.—W.J.M., 22/10/94. File.—J.D., 26/10/94.

## Appendix No. 79.

## E. M. Clark, Esq., M.P., to The Under Secretary for Public Works.

Sir, Legislative Assembly, N.S.W., Sydney, 18 September, 1895.

Referring to my former letter on the subject of the extension of Carter, Gummow, & Co.'s contract at Marrickville, I should be glad to know what has been done in this matter, as the people in my electorate requiring this kind of work are still unemployed. I have spoken to Mr. McLean, M.P., who is also interesting himself on the extension referred to, and he is anxious that the work should be pushed on, in connection with this particular scheme, as speedily as possible. I understand it would also give employment to a large number of men in his own and the adjoining electorate.

Yours, &c.,

EDWARD M. CLARK.

A similar reply to that authorised to be sent to Mr. McLean on the 17th instant (see 95-823), may be forwarded to Mr. Clark.—J. BARLING, Under Secretary for Public Works, 20/9/95. Approved.—J.H.Y., 23/9/95. Inform.—23/9/95. E. M. Clark, Esq., M.P., informed.—24/9/95. Mr. Darley for U.S.—Jno. P., 25/9/95. Seen.—C.D., 27/9/95.

## E. M. Clark, Esq., M.P., to The Under Secretary for Public Works.

Sir, Legislative Assembly, N.S.W., Sydney, 21 August, 1895.

In view of the fact that a large number of sewerage labourers, living in my electorate, are at present idle, I would respectfully urge that something might be done to facilitate the necessary work for this kind of labour. I understand that the only work of the kind immediately available is an extension of the Northern Branch of the Western Suburbs at Marrickville. As this would absorb nearly 250 men, and the present adjoining contractors—Messrs. Carter, Gummow, & Co.—have all the necessary plant available, I would suggest they be allowed to extend their present contract as in the case of the North Sydney work early last year. If this were done I am sure it would be appreciated by a large number of men especially suited for this kind of work, and remove them from competition with less skilled labour.

Trusting you will give this matter consideration.

Yours, &c.,

EDWARD M. CLARK.

Mr. Darley for report.—J.B., 23/8/95. For report, when can the plans for first section of the extension be ready.—C.D., 26/8/95. The Supervising Engineer. See action in 95-438 herewith.—T.G., 12/9/95. Engineer-in-Chief Metropolitan Sewerage Construction.

## F. E. McLean, Esq., M.P., to the Secretary for Public Works.

Sir,

I desire to urge upon your notice the importance of proceeding with that portion of the western suburbs sewerage scheme, which may be described as the northern branch, extending from Premier-street, Marrickville, to the Old Canterbury Road. I may point out that the present contract is now so nearly completed that a number of men have been paid off and are now idle. If the northern branch is proceeded with at once a large number of these men will receive early employment.

Marrickville, 26 August, 1895.

I have, &amp;c.,

F. E. McLEAN.

The Hon. Minister for Public Works.

Mr. Darley for report.—J.B., 29/8/95. For report.—C.D., 31/8/95.

Permanent surveys have been prepared of the portion referred to, and contract drawings for same might be gone on with; but as a modification of the system embraced by northern and western branches is now being considered, it is very probable that the size of sewer will be altered from that originally designed, and it would not therefore be advisable to take action before the modified scheme has been finally considered.—T.G., 12/8/95. Supervising Engineer, Metropolitan Sewerage Construction. Engineer-in-Chief, Metropolitan Sewerage Construction.

Forwarded for the information of the Minister. I found it necessary to delay proceeding with the main northern branch to enable me to reconsider an alteration to the western branch, which may necessitate a modification of a portion of the northern branch. I am now looking into the question, and soon after it is decided we can invite tenders for the first section.—C.D., Engineer-in-Chief, Metropolitan Sewerage Construction, 13/9/95. The U.S., P.W.

May be so informed.—J. BARLING, Under Secretary for Public Works, 16/9/95. Approved.—J.H.Y., 17/9/95. Inform, 17-18/9/95. E. M. Clark, Esq., M.P., and F. E. McLean, Esq., M.P., informed, 23/9/95.

## Appendix No. 80.

## The Supervising Engineer to The Engineer-in-Chief for Sewerage.

MINUTE PAPER.

Subject:—Contract No. 69, Eastern Branch, Western Suburbs, Surplus Material.

Department of Public Works, Roads and Bridges and Sewerage Branch,

Sydney, 18 January, 1894.

THE surplus material from the excavation of shafts, open cutting, and tunnels is not required by the department. I beg to recommend that the contractors be informed that they may dispose of it as they think fit, and that they shall be paid for the work under schedule item No. 43.

J. DAVIS.

Approved.—R.H., 19/1/94. Messrs. Carter, Gummow, & Co.—19/1/94. Mr. Millner to note.—J.D., 19/1/94. Noted.—W.J.M., 23/1/94.

## Appendix No. 81.

## The Accountant, Department of Public Works, to The Acting Engineer-in-Chief, Board of Water Supply and Sewerage.

Contract No. 69.

Sydney, 29 May, 1895.

|   | £       | s. | d. |
|---|---------|----|----|
| Value of Work to date of last measurement (20/5/95) ..... | 47,841  | 17 | 3  |
| Amount of contract as per tender .....                    | 45,207  | 3  | 11 |
| Excess .....  | £ 2,634 | 13 | 4  |

It will be necessary to obtain Ministerial authority for the excess, or the vouchers will be in danger of being returned by the Treasury.

E. HUNGERFORD.

Urgent. Will Mr. Griffiths report as to cause or particulars *re* excess over contract.—J.M.S., 30/5/95.

The original estimate was based on the assumption that the work would chiefly be in rock, whereas it has been in soft ground, necessitating a larger amount of excavation to provide for timbering, &c. This applies specially in tunnel work, where the price is high.—T.G., 3/6/95. Supervising Engineer, Metropolitan Sewerage Construction. Acting Engineer-in-Chief, Metropolitan Sewerage Construction.

## The Acting Engineer-in-Chief, Metropolitan Sewerage Construction, to The Under Secretary for Public Works.

MINUTE PAPER.

Subject:—Contract No. 69, Western Suburbs Sewerage Scheme.

Department of Public Works, Engineer-in-Chief's Office, Metropolitan Sewerage Construction,

Sydney, 3 May, 1895.

It will be necessary to obtain Minister's approval before Treasury will pay the enclosed progress payment on above contract.

|   | £       | s. | d. |
|---|---------|----|----|
| The aggregate amount of original tender is .....                            | 45,207  | 3  | 11 |
| The value of work on last measurement, 20/5/95, at schedule rates, is ..... | 47,841  | 17 | 3  |
| Being an excess of .....  | £ 2,634 | 13 | 4  |

Of this amount it is proposed to advance contractor £2,420.

The Supervising Engineer reports that the excess is due to the contract quantities being based on the assumption that work would be chiefly in rock, whereas it turned out to be in soft ground, necessitating a larger amount of excavation, the excess being chiefly on the item for tunnelling, where the rate was high. As the contract is at schedule rates, the actual amount of contract cannot be finally ascertained until final adjustment of quantities is made, when a full report will be submitted. I recommend payment of this advance.

J. M. S.,

Acting Engineer-in-Chief, Metropolitan Sewerage Construction.

For approval to pass this excess pending a full report.—J. BARLING, Under Secretary for Public Works, 4/6/95. Approved.—J.H.Y., 5/6/95. B.C., Mr. Smail.—J.B., 5/6/95. Voucher forwarded to the Treasury, 6/6/95.—S. ADAMS. Mr. Griffiths to note.—J.M.S., 6/6/95. Noted.—T.G., 6/6/95.

This contract is now approaching completion. I estimate that about £2,000 more will complete the works.

|                        | £      | s. | d. |
|------------------------|--------|----|----|
| Total cost (say) ..... | 51,370 | 0  | 0  |
| Estimate .....         | 45,207 | 3  | 11 |

Excess over estimate .....

£ 6,162 16 8

T.G., Supervising Engineer, Metropolitan Sewerage Construction, 8/7/95.  
Engineer-in-Chief, Metropolitan Sewerage Construction.

The





Appendix No. 84.

CONTRACT No. 72.—CEMENT TESTS.

| No. of Test. | Brand.             | No. of Casks. | Date of Testing.   | No. of Test. | Brand.          | No. of Casks. | Date of Testing.     |
|--------------|--------------------|---------------|--------------------|--------------|-----------------|---------------|----------------------|
| 477          | Germania .....     | 396           | 1891.<br>28 April. | 595          | Germania .....  | 390           | 1891.<br>21 October. |
| 480          | Globe .....        | 350           | 6 May.             |              |                 |               | 1892.<br>16 March.   |
| 476          | Tunnel.....        | 222           | 27 April.          | 668          | " .....         | 360           | 18 "                 |
| 481          | Germania .....     | 568           | 6 May.             | 670          | Camel .....     | 700           | 5 May.               |
| 508          | Globe .....        | 636           | 19 June.           | 680          | Germania .....  | 339           | 19 "                 |
| 502          | " .....            | 525           | 13 "               | 689          | " .....         | 1,030         | 12 "                 |
| 527          | Tunnel.....        | 528           | 28 "               | 684          | " .....         | 600           | 11 "                 |
| 528          | Globe .....        | 830           | 28 July.           | 682          | Globe .....     | 390           | 20 June.             |
| 534          | Germania .....     | 630           | 5 August.          | 703          | Germania .....  | 194           | 25 July.             |
| 565          | " .....            | 550           | 16 September.      | 729          | Globe .....     | 90            | 8 September.         |
| 584          | Camel .....        | 500           | 13 October.        | 763          | Germania .....  | 410           | 5 August.            |
| 596          | Red Cross .....    | 350           | 22 "               | 742          | Red Cross ..... | 200           |                      |
| 560          | Germania .....     | 800           | 8 September.       |              |                 |               |                      |
| 609          | Hamburg Arms ..... | 300           | 15 November.       |              | Total .....     | 11,888        |                      |

RETURN of Cement used, taking from Inspector's daily reports.

| Date.            | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors. | Date.           | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors. |
|------------------|---------------------------|----------------------------|----------------------------|-------------|-----------------|---------------------------|----------------------------|----------------------------|-------------|
| 1891.<br>13 July | 63                        | .....                      | .....                      | G. Wagg.    | 1891.<br>7 Oct. | 44                        | .....                      | 1                          | G. Wagg.    |
| 14 "             | 52                        | .....                      | .....                      | "           | 8 "             | 64                        | .....                      | 3½                         | "           |
| 15 "             | 86                        | .....                      | .....                      | "           | 9 "             | 76                        | .....                      | 2½                         | "           |
| 16 "             | 52                        | .....                      | .....                      | "           | 10 "            | 40                        | .....                      | 2                          | "           |
| 17 "             | 82                        | .....                      | .....                      | "           | 12 "            | 78                        | .....                      | 4                          | "           |
| 20 "             | 73                        | .....                      | .....                      | "           | 13 "            | 53                        | .....                      | 3                          | "           |
| 21 "             | 85                        | .....                      | .....                      | "           | 14 "            | 48                        | .....                      | 2                          | "           |
| 22 "             | 80                        | .....                      | .....                      | "           | 15 "            | 35                        | .....                      | 3                          | "           |
| 23 "             | 67                        | .....                      | .....                      | "           | 16 "            | 77                        | .....                      | 3½                         | "           |
| 24 "             | 86                        | .....                      | .....                      | "           | 17 "            | 70                        | .....                      | 2                          | "           |
| 25 "             | 58                        | .....                      | .....                      | "           | 19 "            | 74                        | .....                      | 2                          | "           |
| 28 "             | 66                        | .....                      | .....                      | "           | 20 "            | 71                        | .....                      | 2½                         | "           |
| 29 "             | 50                        | .....                      | .....                      | "           | 21 "            | 51                        | .....                      | 2                          | "           |
| 30 "             | 30                        | .....                      | .....                      | "           | 24 "            | 27                        | .....                      | 1                          | "           |
| 31 "             | 56                        | .....                      | .....                      | "           | 26 "            | 74                        | .....                      | 2                          | "           |
| 1 Aug.           | 40                        | .....                      | .....                      | "           | 27 "            | 74                        | .....                      | 3                          | "           |
| 2 "              | 75                        | .....                      | 6                          | "           | 28 "            | 80                        | .....                      | 3                          | "           |
| 3 "              | 68                        | .....                      | .....                      | "           | 29 "            | 53                        | .....                      | 1½                         | "           |
| 4 "              | 87                        | .....                      | .....                      | "           | 30 "            | 57                        | .....                      | 1½                         | "           |
| 5 "              | 63                        | .....                      | .....                      | "           | 31 "            | 55                        | .....                      | 1                          | "           |
| 6 "              | 69                        | .....                      | .....                      | "           | 2 Nov.          | 4                         | .....                      | 18                         | "           |
| 8 "              | 49                        | .....                      | .....                      | "           | 4 "             | 37½                       | .....                      | 4½                         | "           |
| 10 "             | 69                        | .....                      | .....                      | "           | 5 "             | 27                        | .....                      | 4                          | "           |
| 11 "             | 71                        | .....                      | .....                      | "           | 6 "             | 63                        | .....                      | 4                          | "           |
| 12 "             | 72                        | .....                      | .....                      | "           | 7 "             | 37                        | .....                      | 3                          | "           |
| 13 "             | 70                        | .....                      | .....                      | "           | 9 "             | 32                        | .....                      | 5½                         | "           |
| 14 "             | 77                        | .....                      | 6                          | "           | 11 "            | 41                        | .....                      | 2½                         | "           |
| 15 "             | 37                        | .....                      | .....                      | "           | 12 "            | .....                     | .....                      | 3                          | "           |
| 17 "             | 65                        | .....                      | .....                      | "           | 13 "            | 34                        | .....                      | 1½                         | "           |
| 18 "             | 56                        | .....                      | .....                      | "           | 14 "            | 28                        | .....                      | 2½                         | "           |
| 19 "             | 80                        | .....                      | 6                          | "           | 16 "            | .....                     | .....                      | 3½                         | "           |
| 21 "             | 76                        | .....                      | 1                          | "           | 17 "            | .....                     | .....                      | 4½                         | "           |
| 22 "             | 69                        | .....                      | ½                          | "           | 18 "            | .....                     | .....                      | 4                          | "           |
| 24 "             | 15½                       | .....                      | 3¼                         | "           | 19 "            | .....                     | .....                      | 2½                         | "           |
| 25 "             | 80                        | .....                      | 5                          | "           | 20 "            | .....                     | .....                      | 2½                         | "           |
| 26 "             | 69                        | .....                      | 5                          | "           | 21 "            | 15                        | .....                      | 2                          | "           |
| 27 "             | 19                        | .....                      | ½                          | "           | 22 "            | .....                     | .....                      | 10½                        | "           |
| 28 "             | 59                        | .....                      | 4½                         | "           | 25 "            | 15                        | .....                      | 6½                         | "           |
| 29 "             | 50                        | .....                      | 2                          | "           | 26 "            | 13                        | .....                      | 5½                         | "           |
| 31 "             | 71                        | .....                      | 5½                         | "           | 27 "            | .....                     | .....                      | 4½                         | "           |
| 1 Sept.          | 72                        | .....                      | 7                          | "           | 28 "            | .....                     | .....                      | 13½                        | "           |
| 3 "              | 75                        | .....                      | 5                          | "           | 30 "            | .....                     | .....                      | 11½                        | "           |
| 4 "              | 83                        | .....                      | 6                          | "           | 1 Dec.          | ½                         | .....                      | 9½                         | "           |
| 5 "              | 52                        | .....                      | .....                      | "           | 2 "             | .....                     | .....                      | 4                          | "           |
| 8 "              | 69                        | .....                      | .....                      | "           | 3 "             | .....                     | .....                      | 7½                         | "           |
| 10 "             | 80                        | .....                      | 2½                         | "           | 4 "             | 4                         | .....                      | 5½                         | "           |
| 11 "             | 56                        | .....                      | 5                          | "           | 5 "             | 13                        | .....                      | 7                          | "           |
| 12 "             | 76                        | .....                      | 6                          | "           | 7 "             | 5                         | .....                      | 10½                        | "           |
| 14 "             | 36                        | .....                      | 4                          | "           | 8 "             | .....                     | .....                      | 10½                        | "           |
| 15 "             | 61                        | .....                      | 1                          | "           | 9 "             | .....                     | .....                      | 16½                        | "           |
| 16 "             | 75                        | .....                      | 5½                         | "           | 10 "            | .....                     | .....                      | 9                          | "           |
| 17 "             | 68                        | .....                      | 2½                         | "           | 11 & 12 Dec.    | .....                     | .....                      | 11                         | "           |
| 18 "             | 40                        | .....                      | 6                          | "           | 14 Dec.         | .....                     | .....                      | 9                          | "           |
| 19 "             | .....                     | .....                      | 7                          | "           | 15 "            | .....                     | .....                      | 10                         | "           |
| 23 "             | 56                        | .....                      | 4                          | "           | 16 "            | .....                     | .....                      | 13½                        | "           |
| 26 "             | 80                        | .....                      | 5                          | "           | 17 "            | .....                     | .....                      | 4½                         | "           |
| 28 "             | 30                        | .....                      | 6                          | "           | 18 "            | .....                     | .....                      | 13                         | "           |
| 29 "             | 61                        | .....                      | 4                          | "           | 19 "            | .....                     | .....                      | 15½                        | "           |
| 30 "             | 46                        | .....                      | 2                          | "           | 20 "            | .....                     | .....                      | 14                         | "           |
| 1 Oct.           | 106                       | .....                      | 3                          | "           | 21 "            | .....                     | .....                      | 8                          | "           |
| 2 "              | 98                        | .....                      | 3½                         | "           | 22 "            | .....                     | .....                      | 8½                         | "           |
| 3 "              | 97                        | .....                      | 4                          | "           | 23 "            | .....                     | .....                      | 14                         | "           |
| 6 "              | 90                        | .....                      | 2½                         | "           | 24 "            | .....                     | .....                      | 14                         | "           |
|                  | 30                        | .....                      | 2                          | "           | 28 "            | .....                     | .....                      | 14                         | "           |
|                  | 65                        | .....                      | 1½                         | "           | 29 "            | .....                     | .....                      | 13                         | "           |
|                  |                           | .....                      |                            | "           | 30 "            | .....                     | .....                      |                            | "           |

| Date.    | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors.  | Date.   | No. of casks in concrete. | No. of casks in brickwork. | No. of casks in rendering. | Inspectors.  |
|----------|---------------------------|----------------------------|----------------------------|--------------|---------|---------------------------|----------------------------|----------------------------|--------------|
| 1891.    |                           |                            |                            |              | 1892.   |                           |                            |                            |              |
| 31 Dec.  |                           |                            | 6                          | G. Wagg.     | 5 July  | 30                        |                            | 2½                         | J. Gledhill. |
| 1892.    |                           |                            |                            |              | 6 "     | 36                        |                            | 1                          | "            |
| 4 Jan.   |                           |                            | 6½                         | "            | 7 "     | 30                        |                            | 5                          | "            |
| 5 "      |                           |                            | 7                          | "            | 8 "     | 19                        |                            | 5                          | "            |
| 6 "      |                           |                            | 5½                         | "            | 9 "     | 16                        |                            | 2                          | "            |
| 7 "      |                           |                            | 4½                         | "            | 11 "    | 36                        |                            | 5                          | "            |
| 8 "      |                           |                            | 3¾                         | "            | 12 "    | 17                        |                            | 2                          | "            |
| 9 "      |                           |                            | 1½                         | "            | 15 "    | 23                        |                            | 2                          | "            |
| 11 "     |                           |                            | 1¼                         | "            | 16 "    | 21                        |                            | 2                          | "            |
| 13 "     |                           |                            | 2                          | "            | 18 "    | 22                        |                            | 4                          | "            |
| 14 "     |                           |                            | 5½                         | "            | 19 "    | 14                        |                            | 1                          | "            |
| 15 "     |                           |                            | 3                          | "            | 20 "    | 1                         |                            | 1                          | "            |
| 16 "     |                           |                            | 1                          | "            | 21 "    | ½                         |                            | 3                          | "            |
| 18 "     |                           |                            | 2                          | "            | 22 "    | 21                        | 3                          | 3                          | "            |
| 19 "     |                           |                            | 2½                         | "            | 23 "    | 13                        |                            | 1                          | "            |
| 20 "     |                           |                            | 3½                         | "            | 25 "    | 4                         |                            | 3                          | "            |
| 21 "     |                           |                            | 7                          | "            | 27 "    | 11                        |                            | 3                          | "            |
| 22 "     |                           |                            | 5                          | "            | 28 "    | 16                        | 11½                        | 3                          | "            |
| 23 "     |                           |                            | 4½                         | "            | 29 "    | 9                         | 1                          | 3                          | "            |
| 25 "     |                           |                            | 5½                         | "            | 30 "    | 11                        | 1                          | 1                          | "            |
| 27 "     |                           |                            | 5                          | "            | 1 Aug.  | 11                        |                            |                            | "            |
| 28 "     | 1                         |                            | 7                          | "            | 2 "     | 10                        |                            | 2                          | "            |
| 29 "     | 1½                        |                            | 3                          | "            | 3 "     | 9½                        |                            | 3                          | "            |
| 30 "     |                           |                            | ¾                          | "            | 4 "     | 3                         |                            |                            | "            |
| 1 Feb.   |                           |                            | ¾                          | "            | 5 "     | 20                        |                            | 2                          | "            |
| 2 "      |                           |                            | ¾                          | "            | 6 "     | 10                        |                            | 2                          | "            |
| 3 "      |                           |                            | ¾                          | "            | 7 "     | 11½                       |                            | 4                          | "            |
| 16 "     |                           |                            | ½                          | "            | 8 "     | 2                         |                            |                            | "            |
| 28 April | 45                        |                            |                            | A. Inwood.   | 9 "     | 4                         |                            |                            | "            |
| 29 "     | 51                        |                            |                            | J. Gledhill. | 10 "    | 4                         |                            |                            | "            |
| 30 "     | 40                        |                            |                            | "            | 11 "    |                           |                            | 5                          | "            |
| 2 May    | 64                        |                            |                            | "            | 12 "    | 10                        |                            | 2                          | "            |
| 3 "      | 70                        |                            |                            | "            | 13 "    | 12                        |                            | 4                          | "            |
| 4 "      | 10                        |                            |                            | "            | 15 "    | 18                        |                            | 4                          | "            |
| 5 "      | 64                        |                            |                            | "            | 17 "    |                           |                            | 2                          | "            |
| 6 "      | 50                        |                            |                            | "            | 23 "    |                           |                            | 1                          | "            |
| 7 "      | 37                        |                            |                            | "            | 24 "    |                           |                            | 3                          | "            |
| 9 "      | 58                        |                            |                            | "            | 25 "    |                           |                            | 3½                         | "            |
| 10 "     | 67                        |                            |                            | "            | 26 "    |                           |                            | 1                          | "            |
| 11 "     | 75                        |                            |                            | "            | 27 "    |                           |                            | 1                          | "            |
| 12 "     | 50                        |                            |                            | "            | 29 "    |                           |                            | ½                          | "            |
| 13 "     | 27                        |                            |                            | "            | 1 Sept. |                           |                            | 1                          | "            |
| 14 "     | 51                        |                            | 2½                         | "            | 2 "     |                           |                            | ½                          | "            |
| 16 "     | 32                        |                            | 3                          | "            | 3 "     |                           |                            | 1                          | "            |
| 17 "     | 80                        |                            | 3                          | "            | 5 "     |                           |                            | 1                          | "            |
| 18 "     | 58                        |                            | 2½                         | "            | 6 "     |                           |                            | 2½                         | "            |
| 19 "     | 80                        |                            | 1                          | "            | 7 "     |                           |                            | 3½                         | "            |
| 20 "     | 53                        |                            | 2                          | "            | 8 "     |                           |                            | 3                          | "            |
| 21 "     | 20                        |                            | 2                          | "            | 9 "     |                           |                            | 3                          | "            |
| 23 "     | 24                        |                            | 2½                         | "            | 10 "    |                           |                            | 1                          | "            |
| 24 "     |                           |                            | 1                          | "            | 12 "    |                           |                            | 2                          | "            |
| 25 "     | 54                        |                            | 2                          | "            | 13 "    |                           |                            | 3                          | "            |
| 26 "     | 66                        |                            | 2                          | "            | 15 "    |                           |                            | 2½                         | "            |
| 27 "     | 17                        |                            | 2                          | "            | 16 "    |                           |                            | 3                          | "            |
| 28 "     | 43                        |                            | 2                          | "            | 17 "    |                           |                            | 1½                         | "            |
| 30 "     | 52                        |                            | 2½                         | "            | 19 "    |                           |                            | 2½                         | "            |
| 31 "     | 58                        |                            | 3                          | "            | 20 "    |                           |                            | 3                          | "            |
| 1 June   | 31                        |                            | 3                          | "            | 21 "    |                           |                            | 3½                         | "            |
| 2 "      | 50                        |                            | 3                          | "            | 22 "    |                           |                            | 3                          | "            |
| 3 "      | 70                        |                            | 3                          | "            | 23 "    |                           |                            | 3½                         | "            |
| 4 "      | 46                        |                            | 2                          | "            | 26 "    |                           |                            | 3½                         | "            |
| 6 "      | 70                        |                            | 12                         | "            | 27 "    |                           |                            | 1½                         | "            |
| 7 "      |                           |                            | 4½                         | "            | 28 "    |                           |                            | 4½                         | "            |
| 8 "      | 32                        |                            | 4                          | "            | 30 "    |                           |                            | 4                          | "            |
| 9 "      | 13                        |                            | 2                          | "            | 1 Oct.  |                           |                            | 1½                         | "            |
| 10 "     |                           |                            | 3                          | "            | 5 "     |                           | 2                          |                            | "            |
| 11 "     |                           |                            | 2                          | "            | 6 "     |                           | 3                          |                            | "            |
| 13 "     | 42                        |                            | 3                          | "            | 7 "     |                           | 3                          |                            | "            |
| 14 "     | 67                        |                            | 3                          | "            | 8 "     |                           | 3                          |                            | "            |
| 16 "     | 38                        |                            | 3                          | "            | 10 "    |                           | 2½                         |                            | "            |
| 17 "     | 4                         |                            | 62                         | "            | 11 "    |                           | 3                          |                            | "            |
| 18 "     | 20                        |                            | 2                          | "            | 12 "    |                           | 3                          |                            | "            |
| 20 "     |                           |                            | 4                          | "            | 13 "    |                           | 3½                         |                            | "            |
| 21 "     | 50                        |                            | 4                          | "            | 14 "    |                           | 4                          |                            | "            |
| 22 "     | 54                        |                            | 4                          | "            | 15 "    |                           | ½                          |                            | "            |
| 23 "     |                           |                            | 4                          | "            | 18 "    |                           | 2½                         |                            | "            |
| 24 "     | 61                        |                            | 2½                         | "            | 19 "    |                           | 2                          |                            | "            |
| 25 "     | 41                        |                            | 2                          | "            | 20 "    |                           | 3                          |                            | "            |
| 27 "     | 45                        |                            | 4                          | "            | 21 "    |                           |                            |                            | "            |
| 28 "     |                           |                            | 4                          | "            | 22 "    |                           |                            |                            | "            |
| 29 "     |                           |                            | 4                          | "            | 24 "    |                           | 2½                         |                            | "            |
| 30 "     |                           |                            | 4                          | "            | 31 "    |                           |                            |                            | "            |
| 1 July   | 58                        |                            | 3                          | "            | 1 Nov.  |                           | ½                          |                            | "            |
| 2 "      | 21                        |                            | 2                          | "            | 2 "     |                           | ½                          |                            | "            |
| 4 "      |                           |                            | 2                          | "            | Totals  | 8,411½                    | 55                         | 955½                       |              |

| SUMMARY.  |               |
|---|---------------|
| Number of casks of cement used in concrete.....   | 8,411½        |
| Number of casks of cement used in brickwork ..... | 55            |
| Number of casks of cement used in rendering ..... | 955½          |
| <b>Total .....</b>                                | <b>9,421¾</b> |

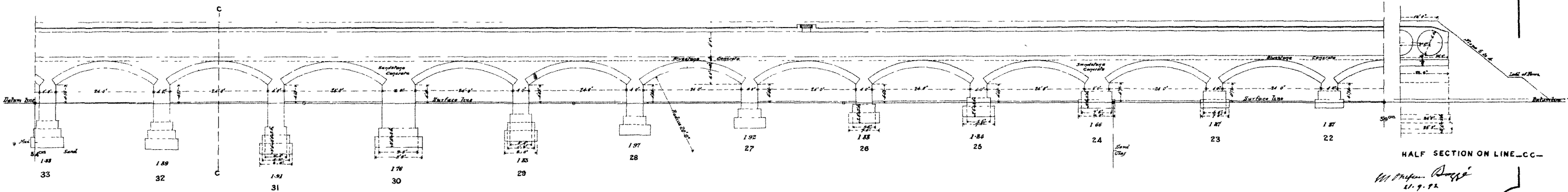
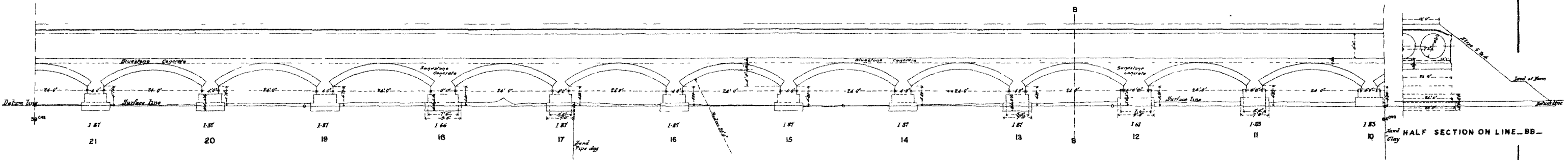
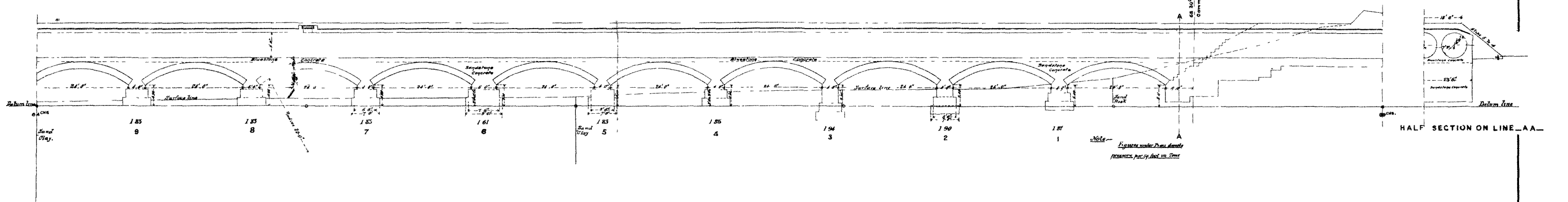
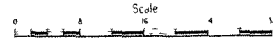
# WESTERN SUBURBS SEWERAGE

## WESTERN OUTFALL SEWER DETAIL OF TRIPPLICATE SEWER FROM 68.30 CHS TO 54 CHS

CONTRACT NO. 101

DRAWING NO. 2

NOTE  
The Embankment as shown  
is not to be executed



W. H. Thompson  
11.9.92

# WESTERN SUBURBS SEWERAGE

CONTRACT NO. 101

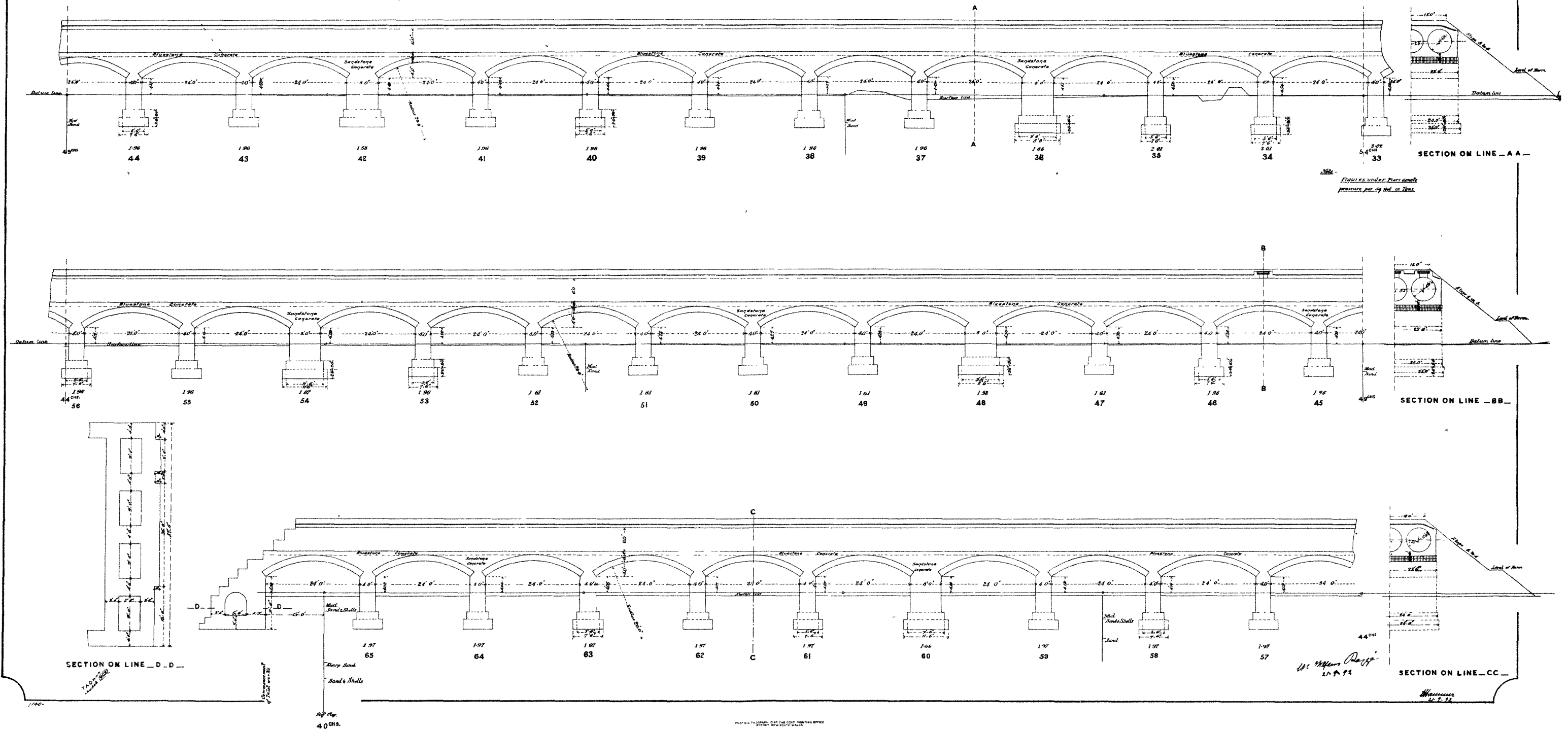
DRAWING NO. 3

## WESTERN OUTFALL SEWER DETAIL OF TRIPPLICATE SEWER FROM 54CH<sup>S</sup> TO COMMENCEMENT OF INLETWORKS



NOTE

The Embankment as shown  
is not to be executed



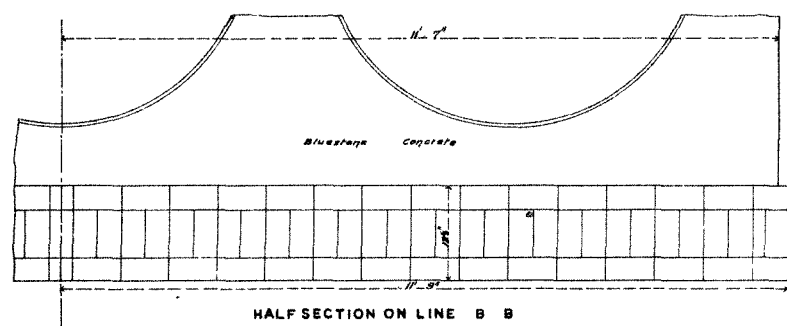
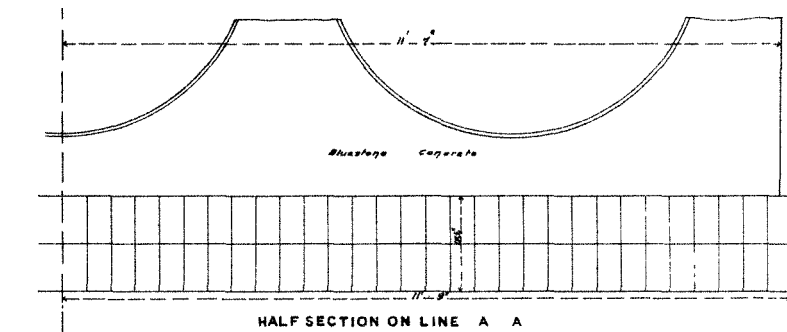
# WESTERN SUBURBS SEWERAGE

## WESTERN OUTFALL SEWER

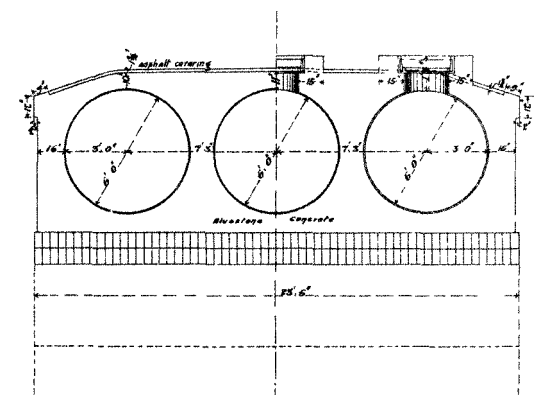
### DETAILS OF ARCHES & PILING UNDER PIERS

CONTRACT NO. 101  
DRAWING NO. 4

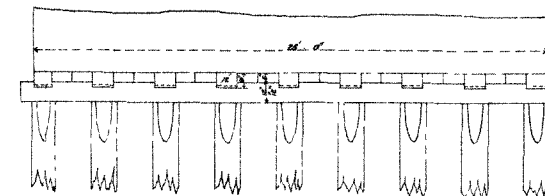
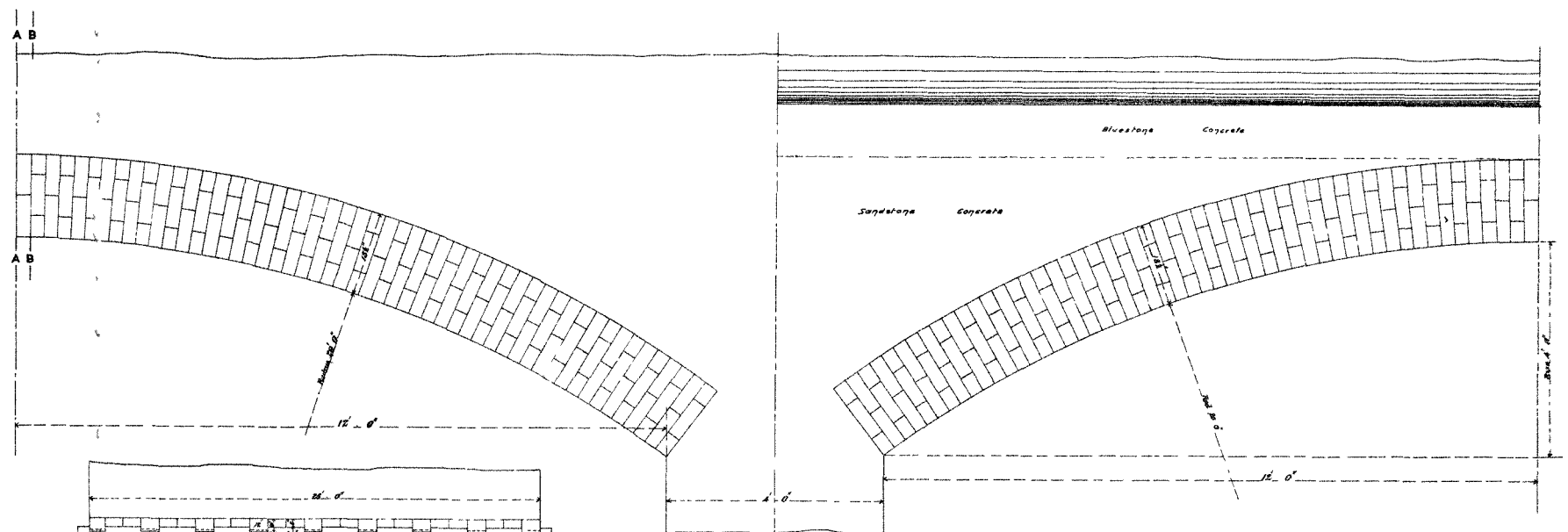
Scale  
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27



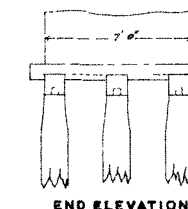
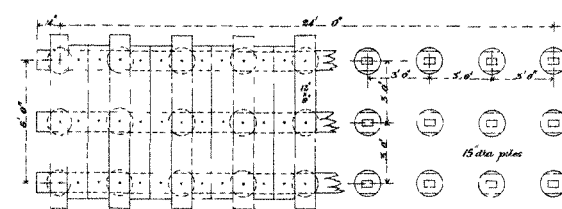
HALF SECTION ON LINE B B



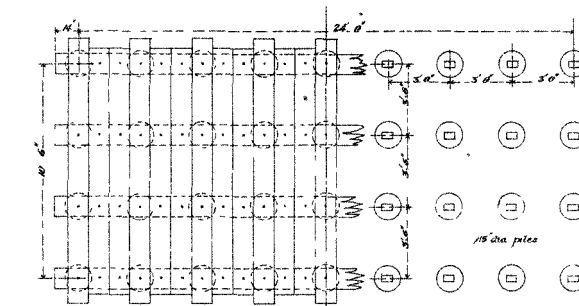
Note  
The Embankment as shown is not to be executed



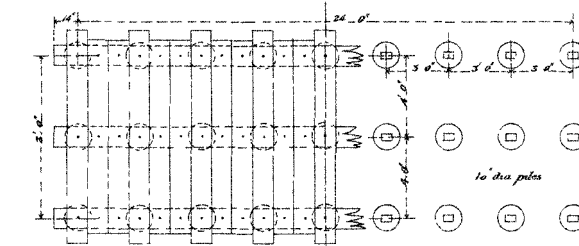
PLATFORM FOR 7' 0" X 25' 0" BASE  
SIDE ELEVATION  
If ORDERED



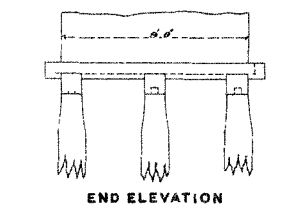
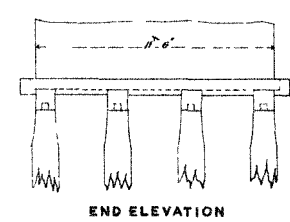
Scale  
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27



PLATFORM FOR 11'-6" X 25' 0" BASE  
If ORDERED



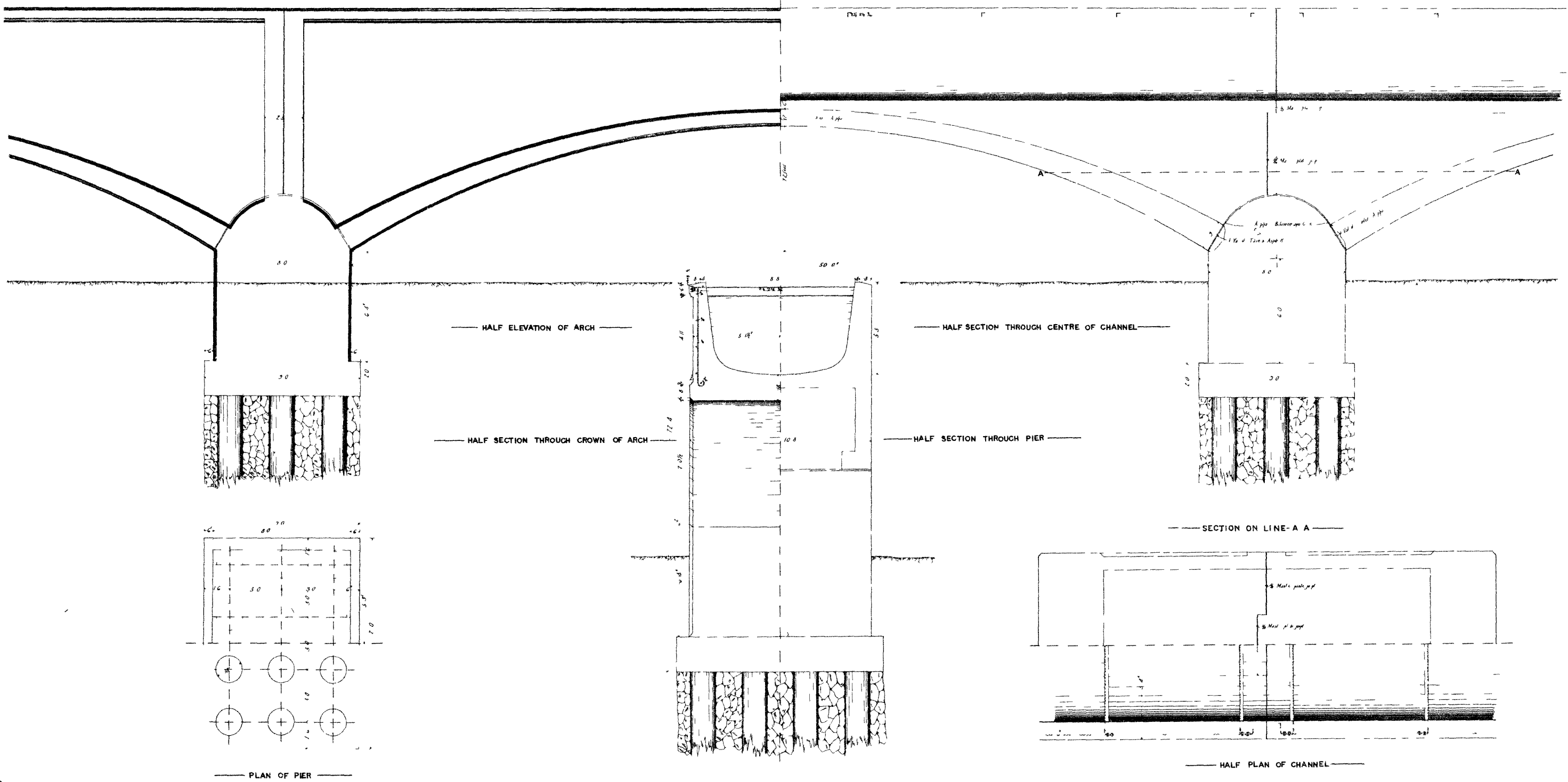
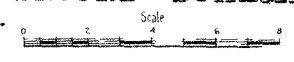
PLATFORM FOR 9' 0" X 25' 0" BASE  
If ORDERED



W. H. H. H. H.  
21.9.92

H. H. H. H.  
21.9.92

WESTERN OUTFALL SEWER  
 FOURTH DIVISION  
 SECOND SCHEME





——— WESTERN OUTFALL SEWER ———  
 ——— FOURTH DIVISION ———  
 ——— FIRST SCHEME ———

Scale

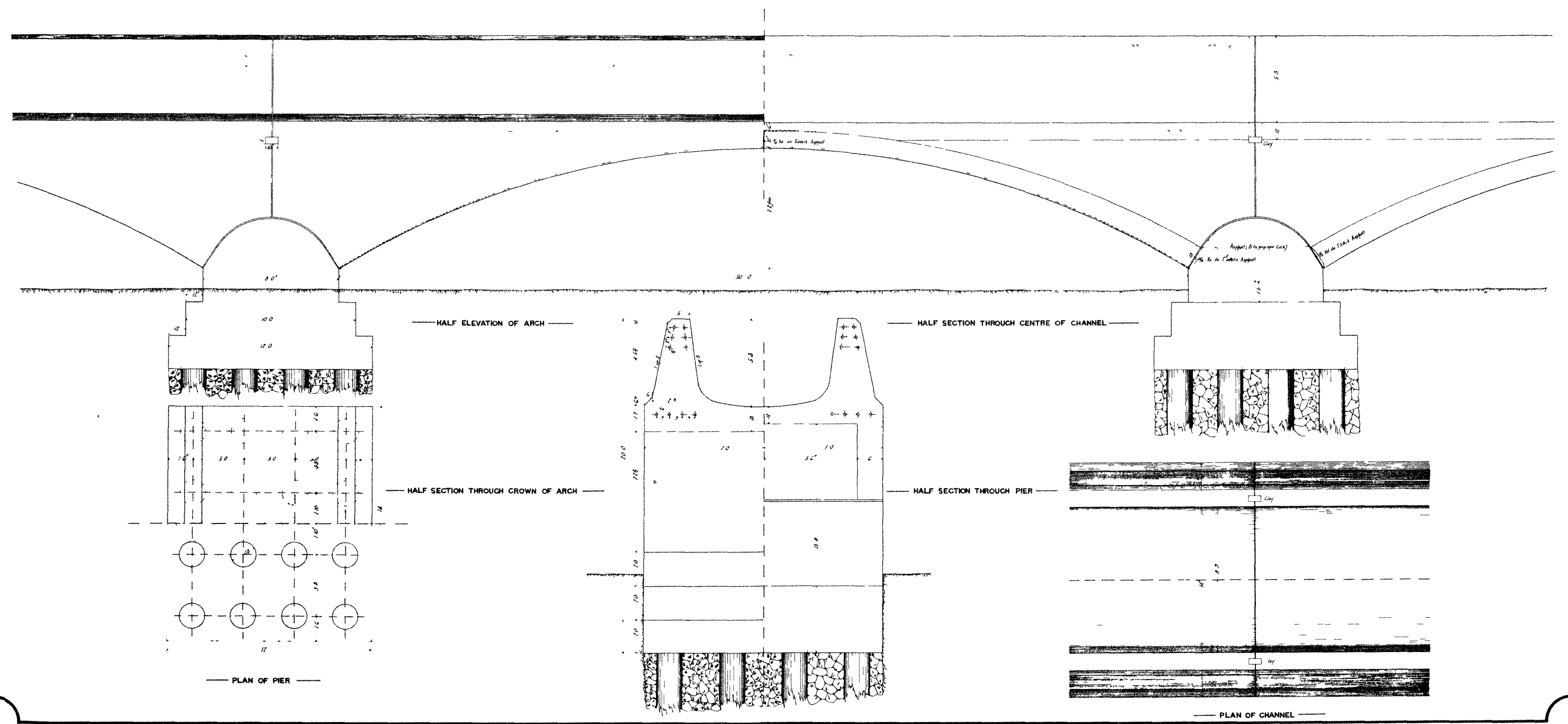
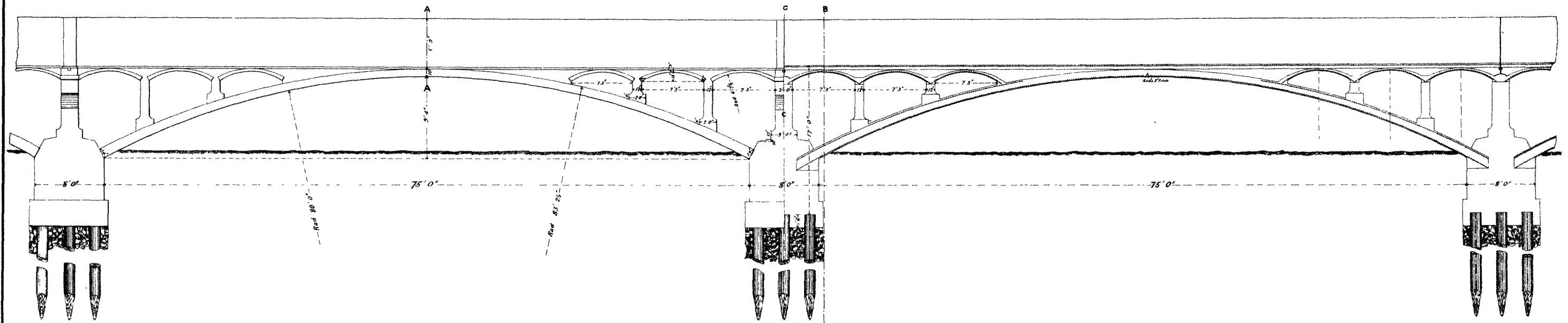
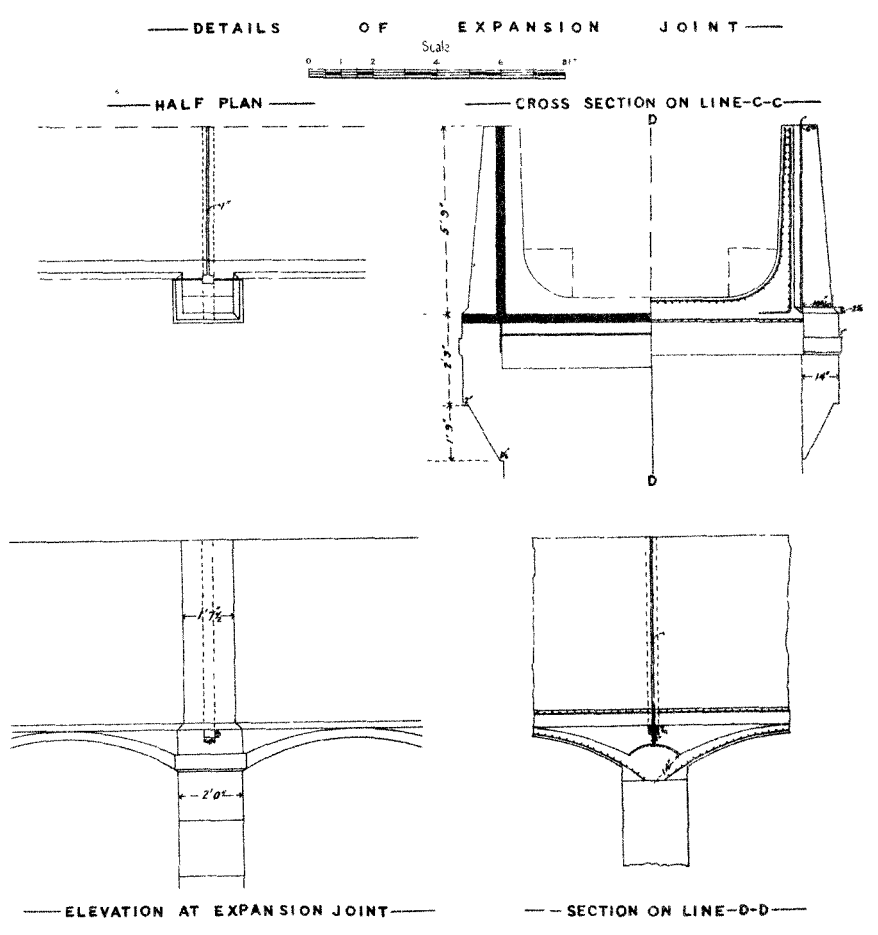
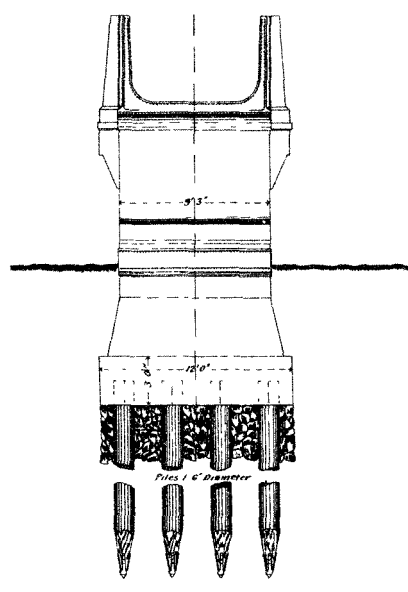
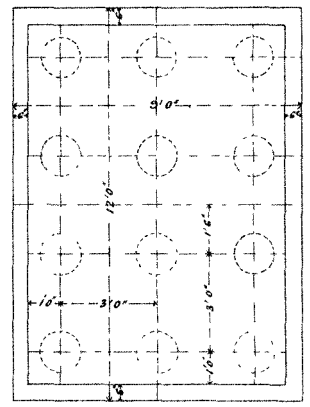
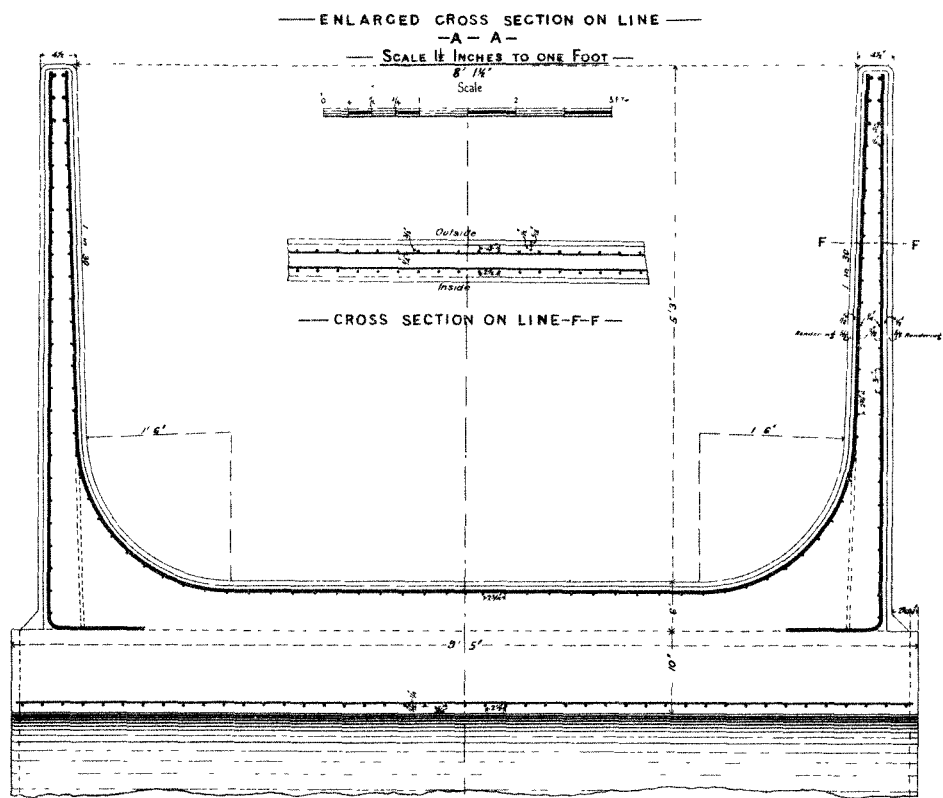


PHOTO: THE ARCHITECTS' OFFICE

# —WESTERN OUTFALL SEWER—

## —FOURTH DIVISION— —THIRD SCHEME—



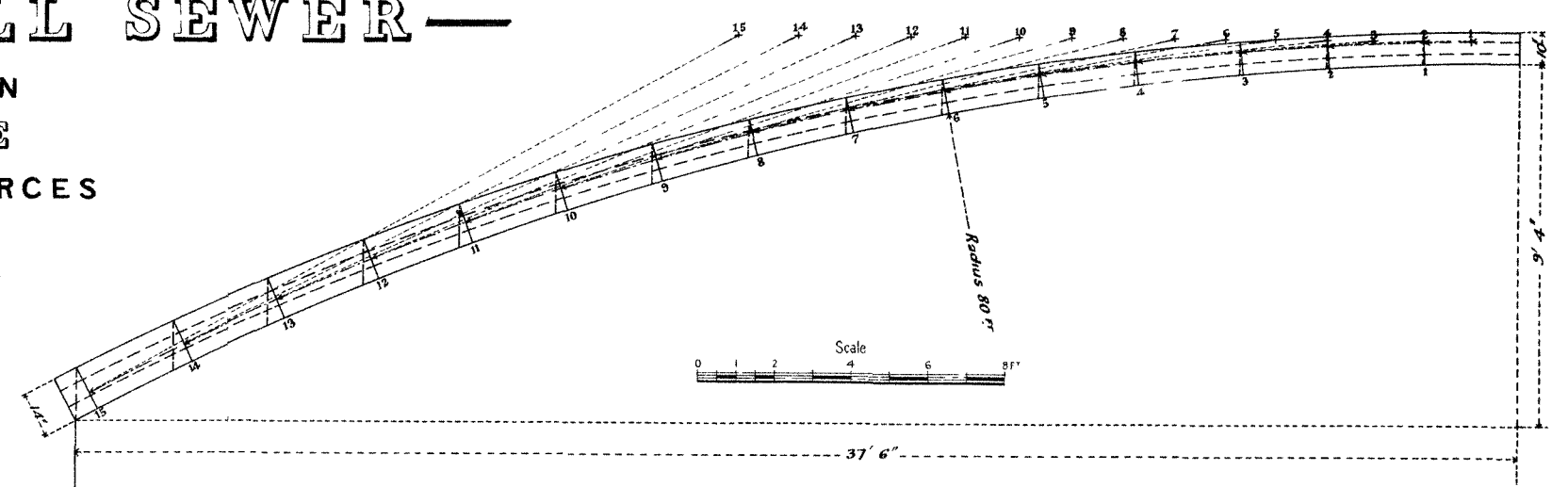
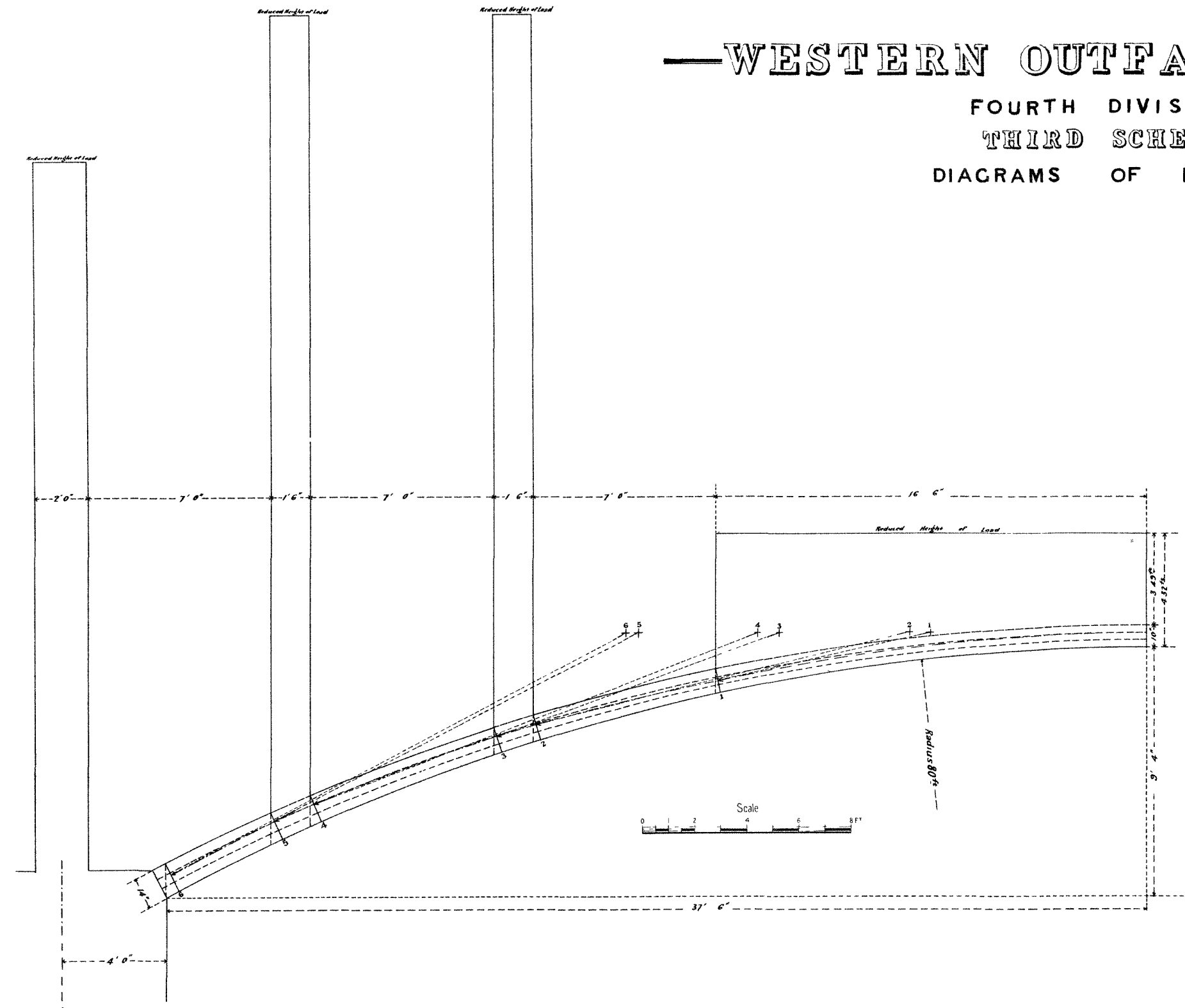
—LONGITUDINAL ELEVATION AND SECTION—

(140-)

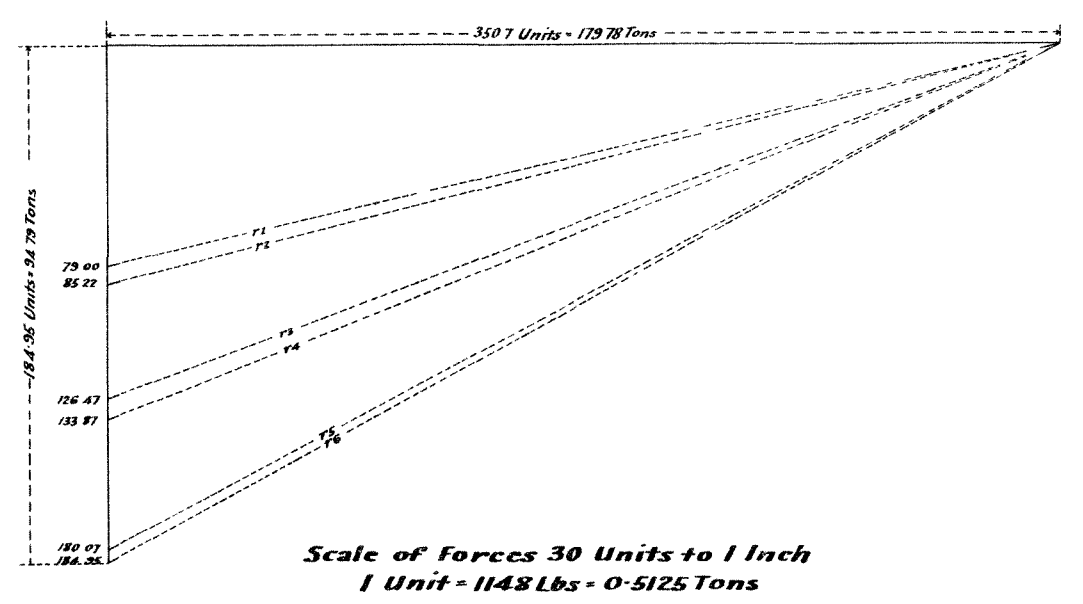
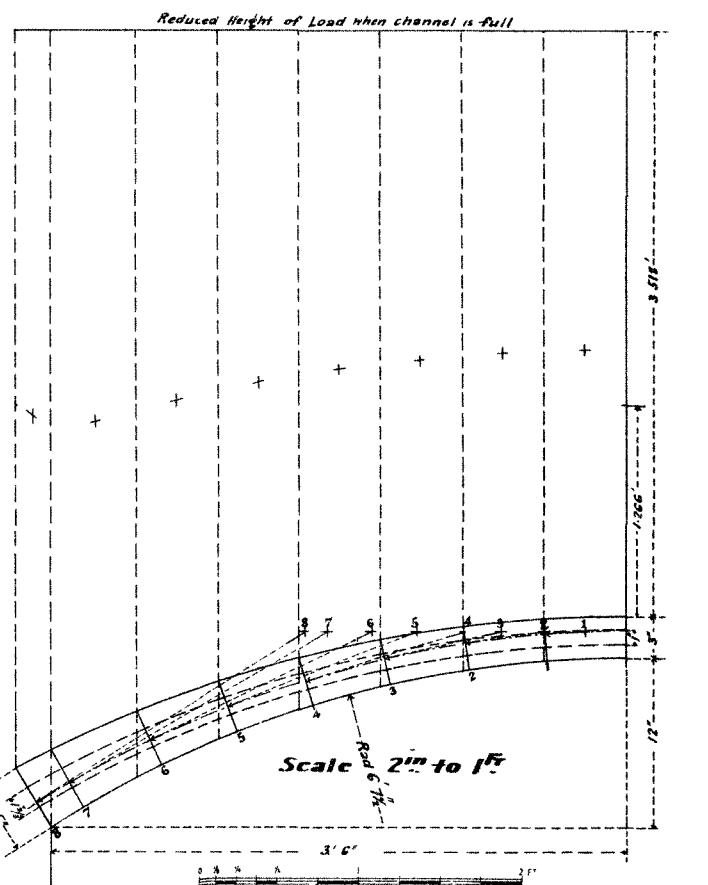
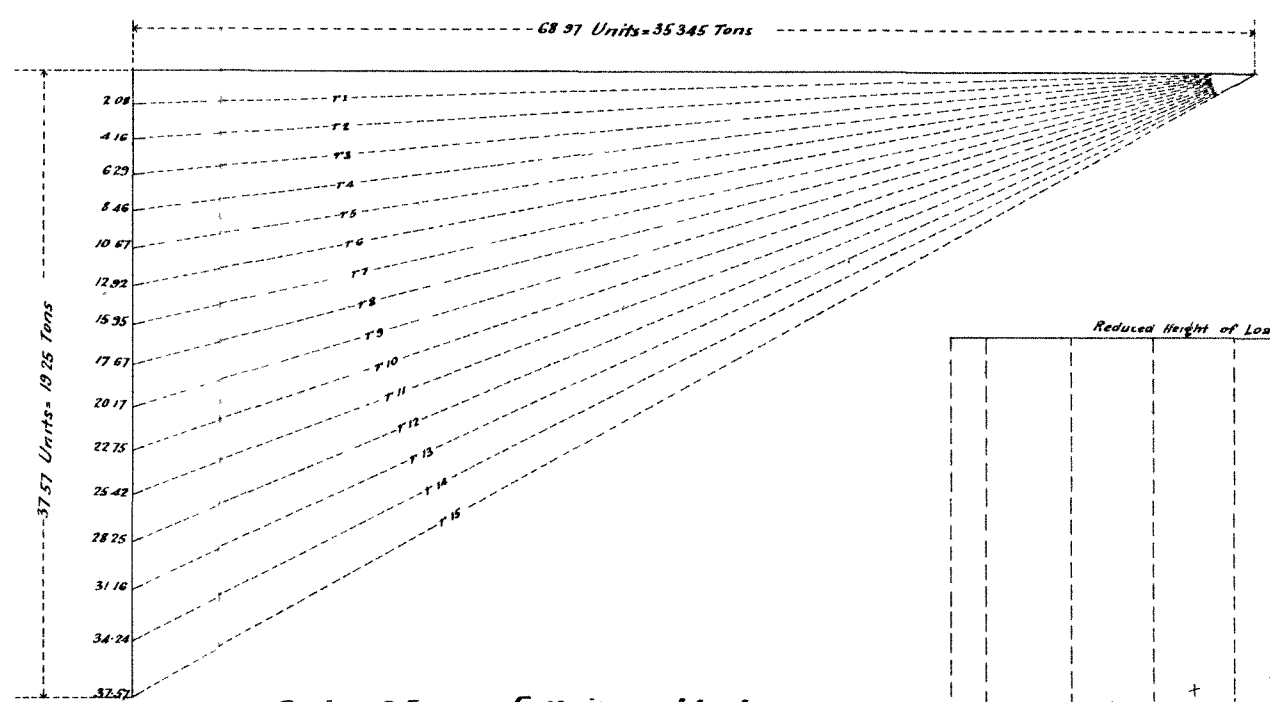
W. H. ... ARCHT. & CIV. ENGRS. OFFICE ...

# WESTERN OUTFALL SEWER

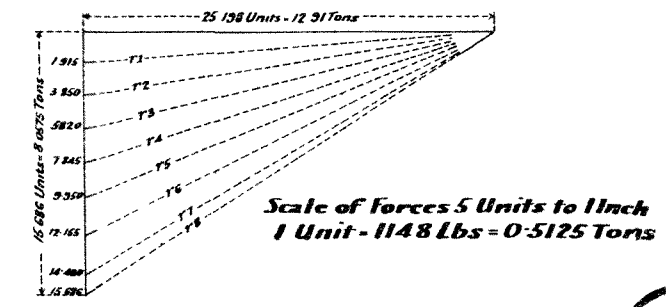
FOURTH DIVISION  
THIRD SCHEME  
DIAGRAMS OF FORCES



Arch Unloaded

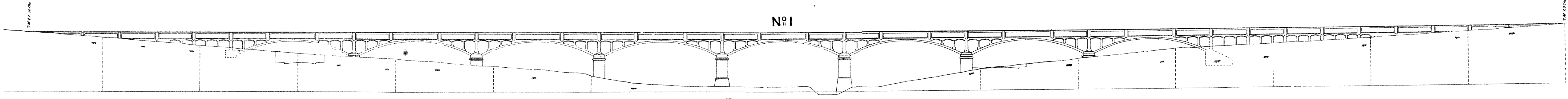
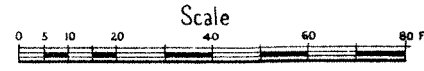


NOTE  
 Resultant Lines shown thus ———  
 Pressure do do do - - - - -



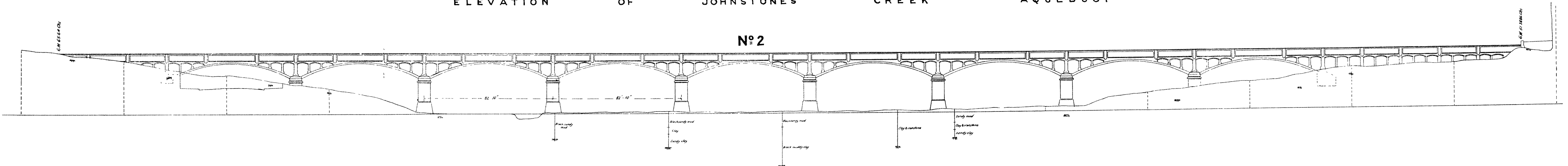
C1  
 CONTRACT N°77  
 DRAWING N°11.

ELEVATION OF WHITE'S CREEK AQUEDUCT

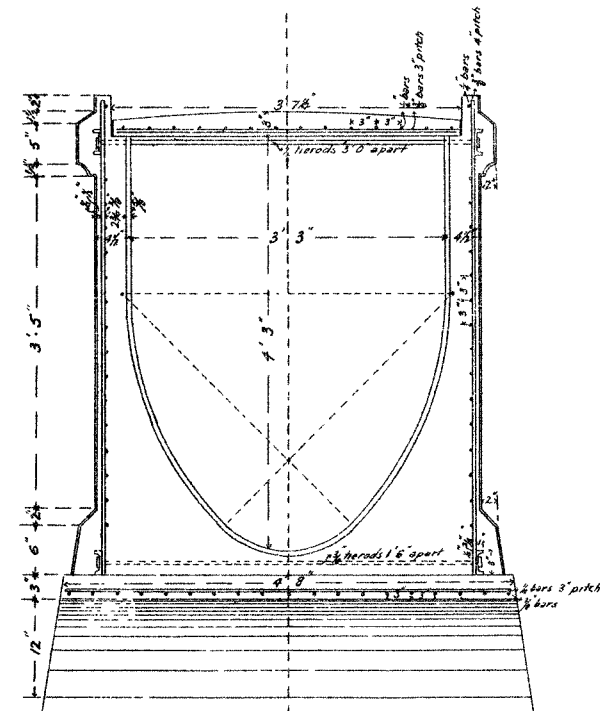
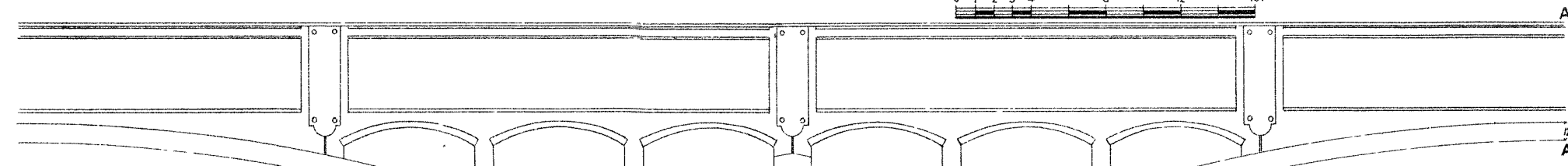
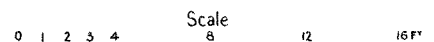


ELEVATION OF JOHNSTONE'S CREEK AQUEDUCT

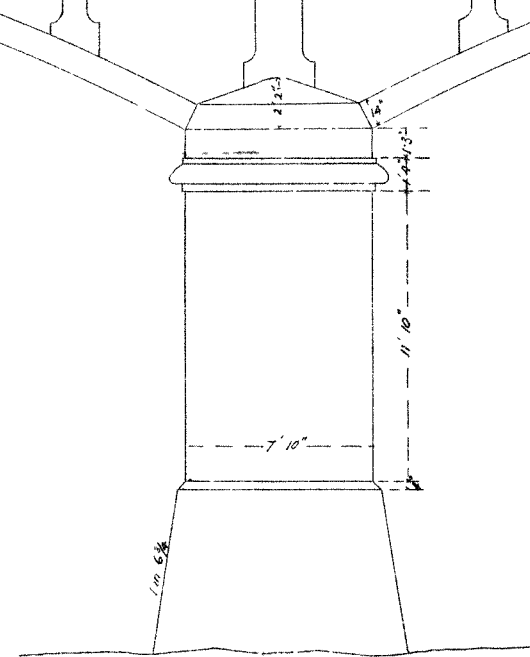
N°2



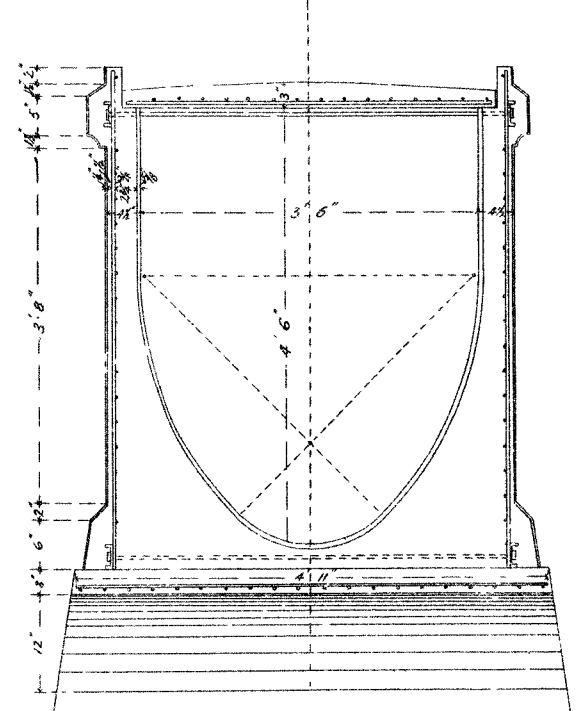
DETAIL OF PIER & ARCH



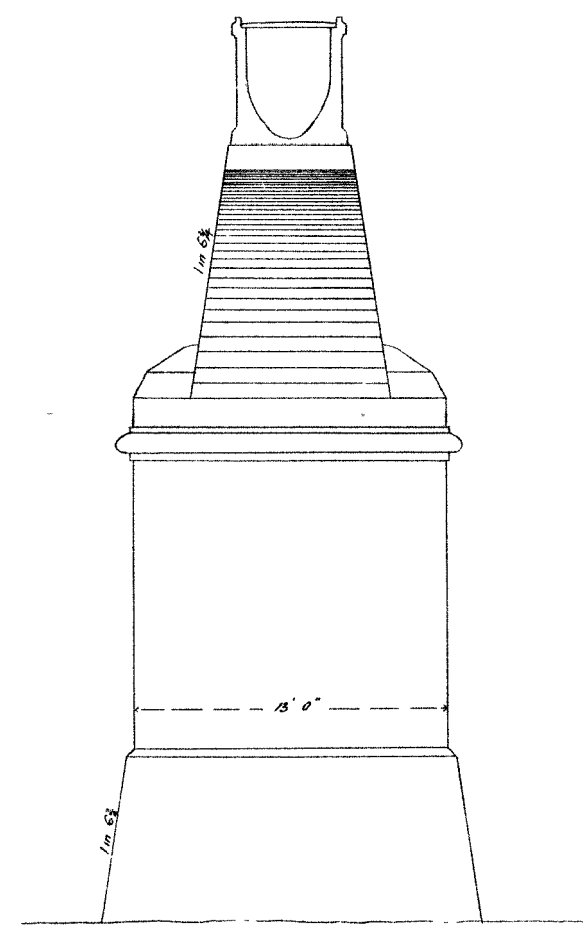
CROSS SECTION OF CHANNEL N°1



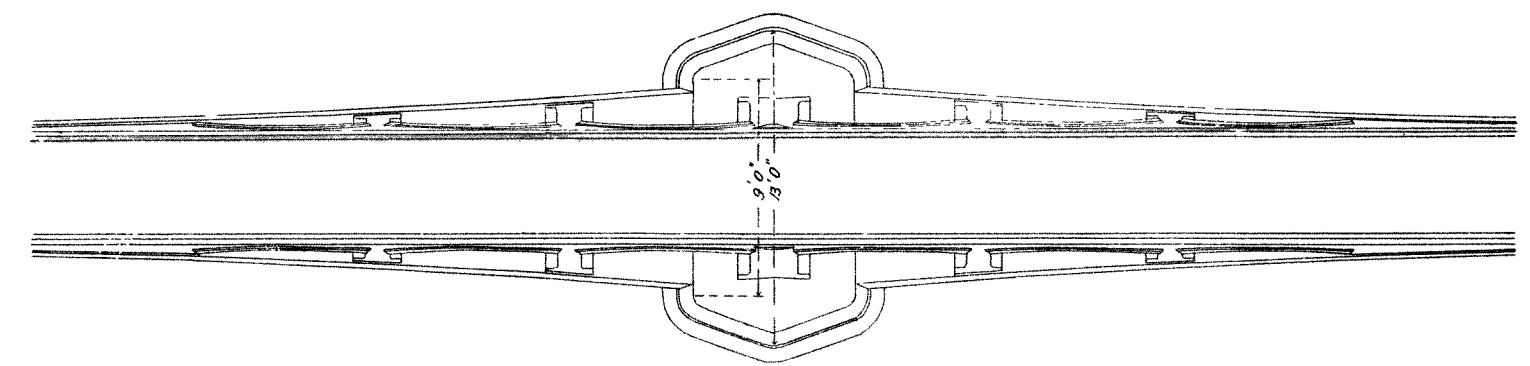
FRONT ELEVATION



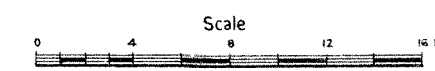
CROSS SECTION OF CHANNEL N°2



CROSS SECTION ON LINE-A-A-



TOP VIEW OF AQUEDUCT



(140-)



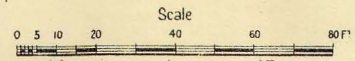
# WESTERN SUBURBS SEWERAGE

NORTHERN MAIN SEWER 2<sup>ND</sup> DIVISION

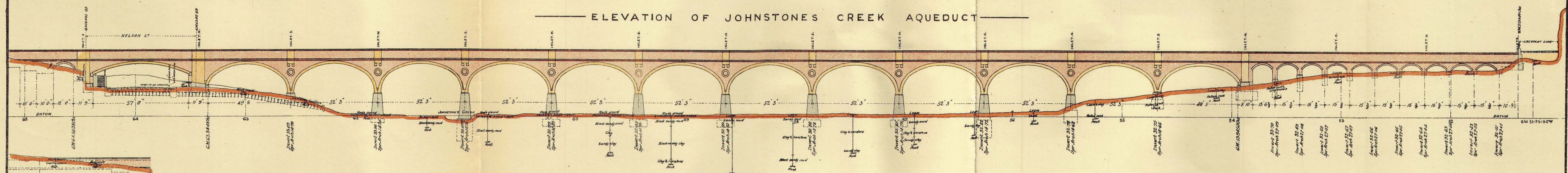
ANNANDALE & LEICHHARDT

## DETAILS OF JOHNSTONE'S CREEK AQUEDUCT

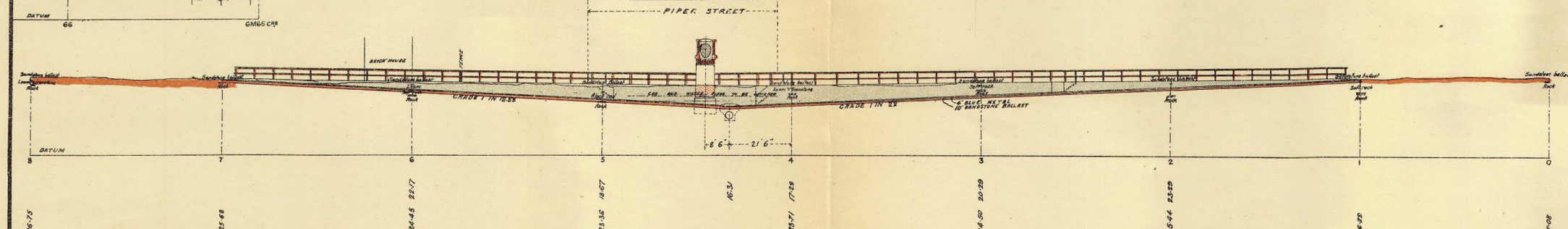
CONTRACT NO. 77  
DRAWING NO. 4



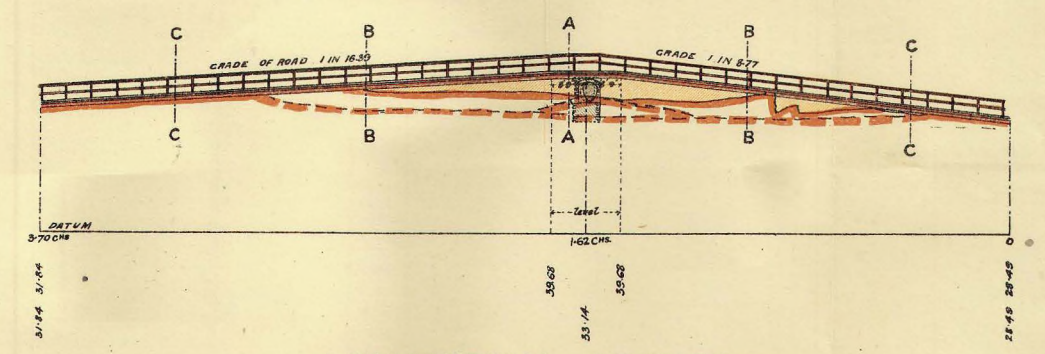
### ELEVATION OF JOHNSTONE'S CREEK AQUEDUCT



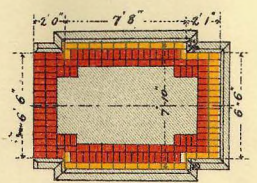
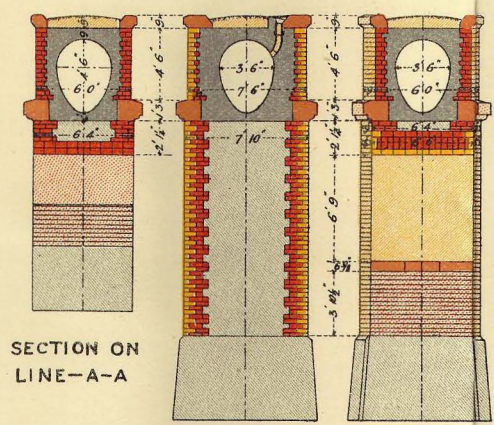
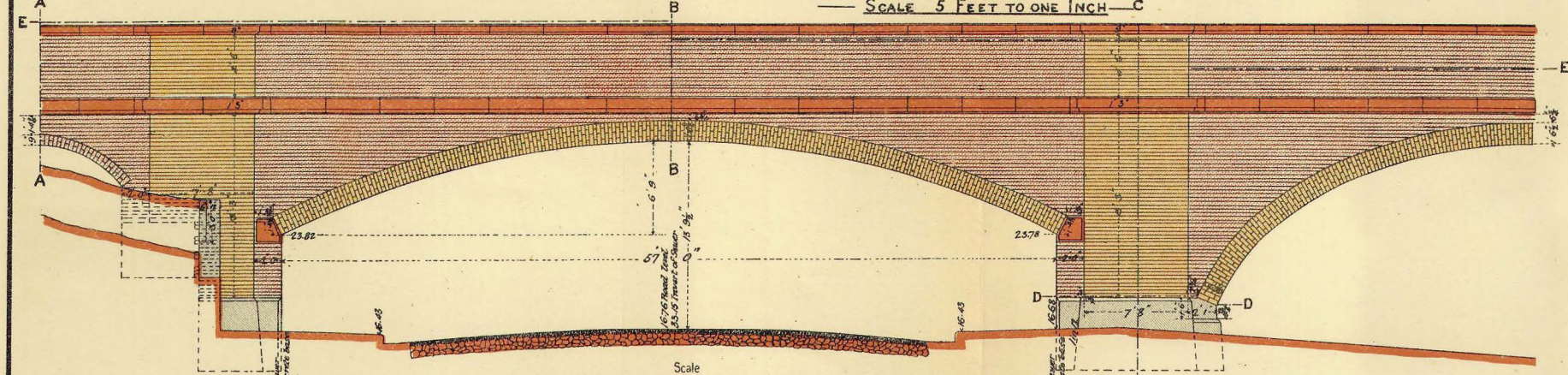
### CROSSING AT NELSON ST LONGITUDINAL SECTION LOOKING WEST



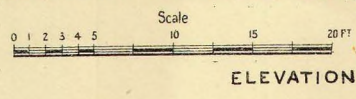
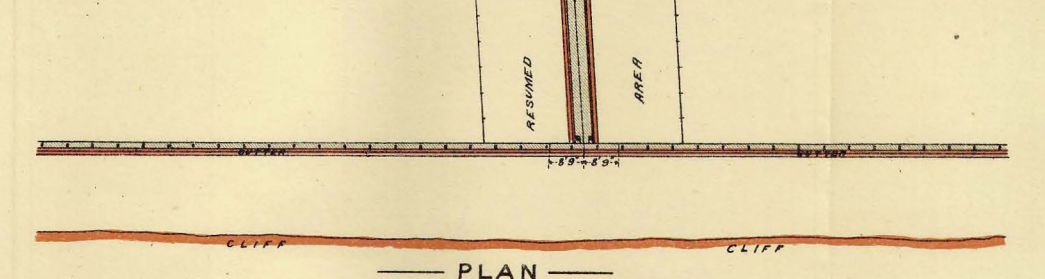
### CROSSING AT CRESCENT LANE



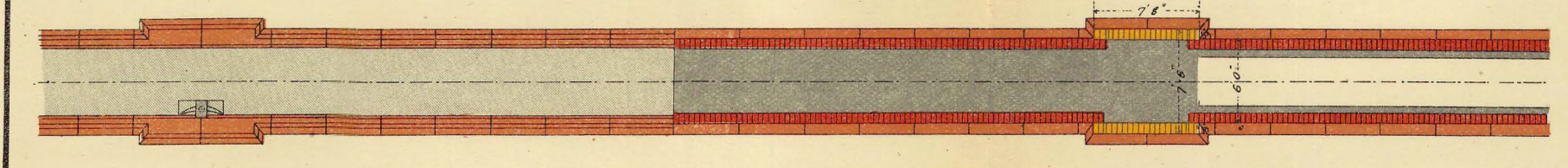
### DETAILS OF ABUTMENTS & BRIDGE OVER NELSON ST SCALE 5 FEET TO ONE INCH



### LONGITUDINAL SECTION LOOKING WEST

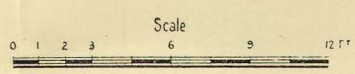
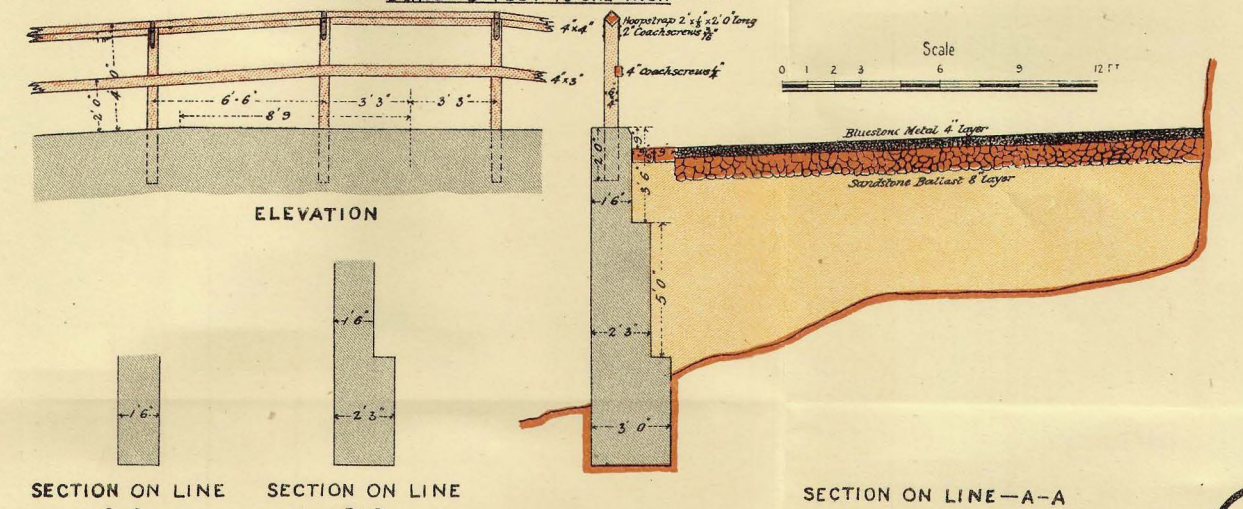


### HORIZONTAL SECTION ON LINE-E-E



### HORIZONTAL SECTION ON LINE-D-D

### DETAILS OF RETAINING WALL & HANDRAIL SCALE 3 FEET TO ONE INCH



10/1/15  
(140-)



# WESTERN SUBURBS SEWERAGE

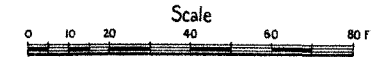
NORTHERN MAIN SEWER 2<sup>ND</sup> DIVISION

ANNANDALE & LEICHHARDT

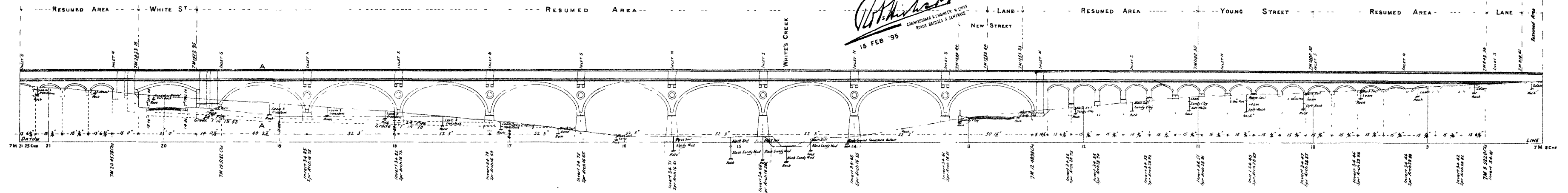
DETAILS OF WHITE'S CREEK AQUEDUCT

CONTRACT N<sup>o</sup> 77

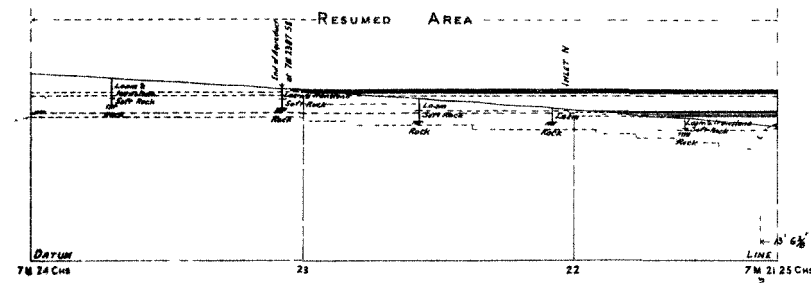
DRAWING N<sup>o</sup> 6.



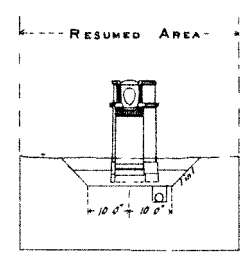
*W. H. ...*  
15 FEB '95  
COMMISSIONER & ENGINEER IN CHIEF  
ROADS BRIDGES & CANALS



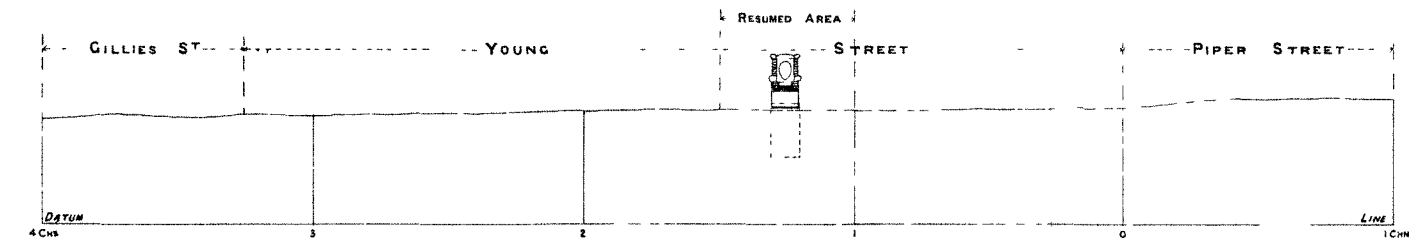
GENERAL ELEVATION OF WHITES CREEK AQUEDUCT



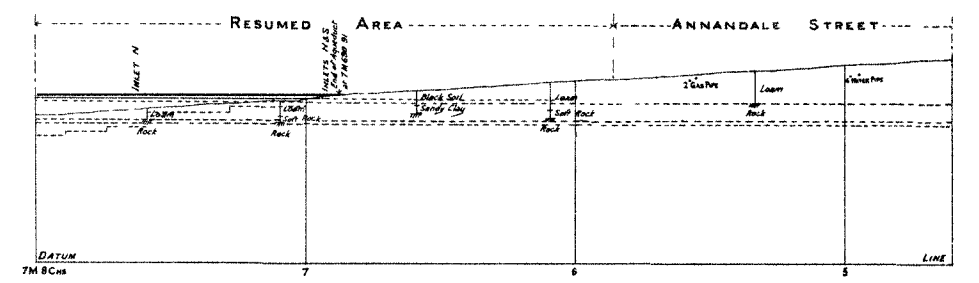
CONTINUED ELEVATION OF AQUEDUCT



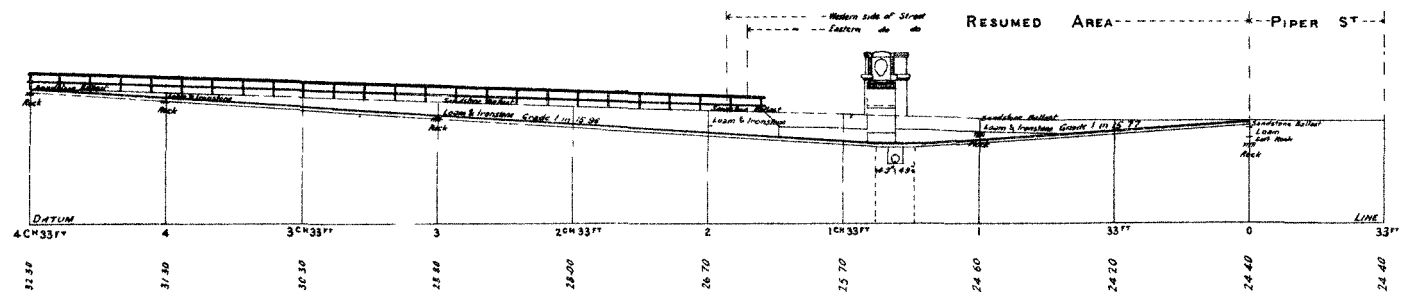
SECTION ON LINE A A



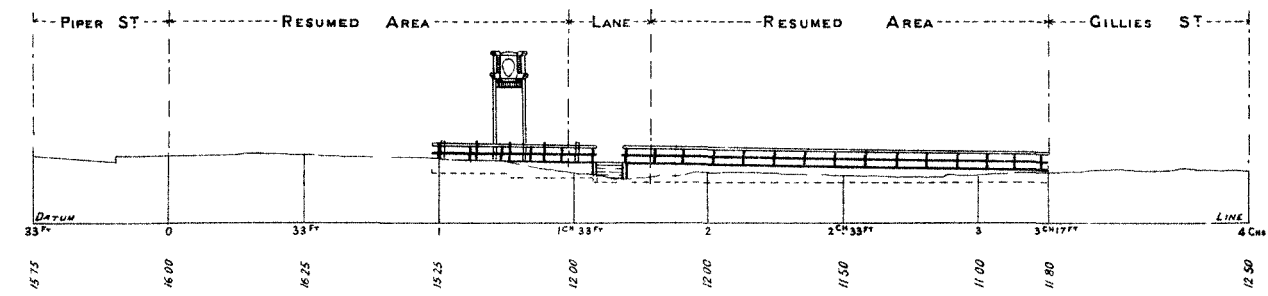
LONGITUDINAL SECTION OF YOUNG STREET



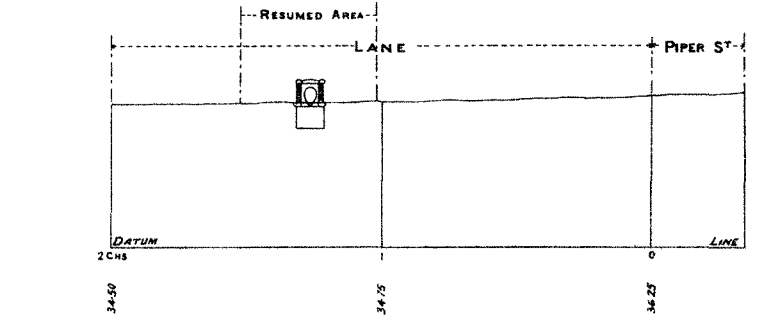
CONTINUED ELEVATION OF AQUEDUCT



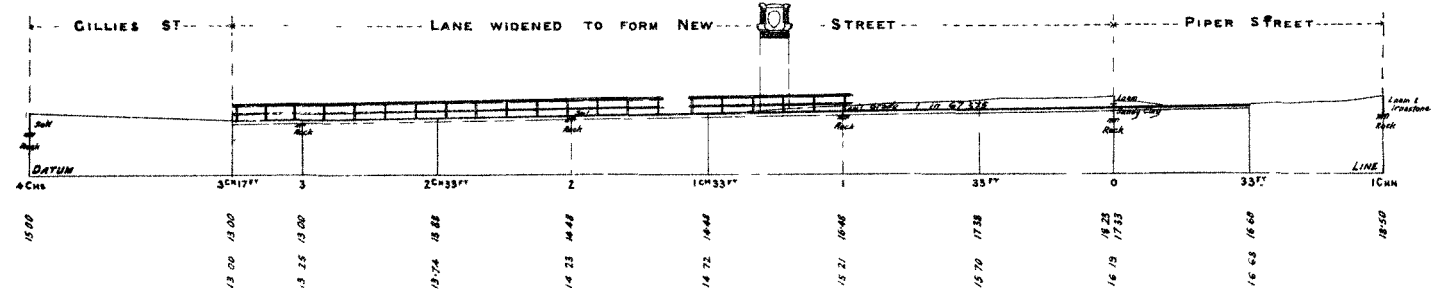
LONGITUDINAL SECTION OF WHITE STREET



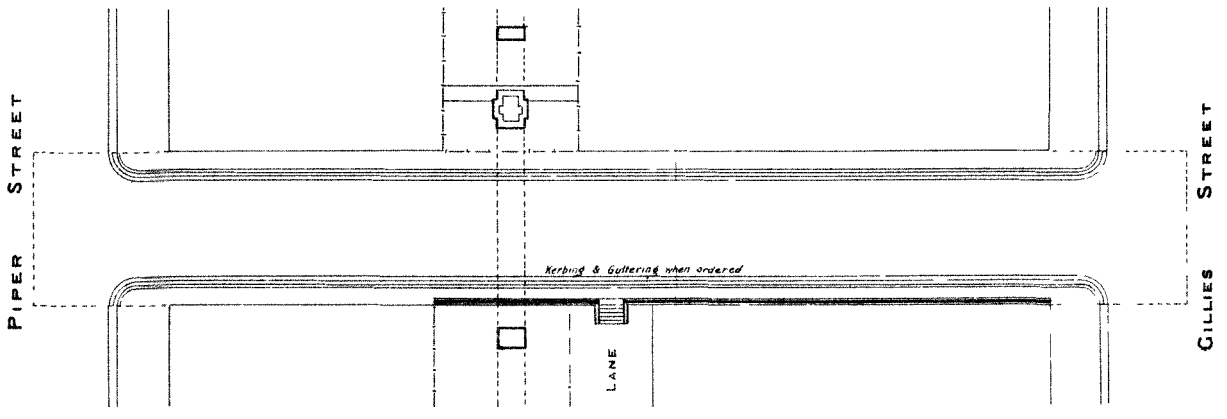
ELEVATION OF RETAINING WALL (NEW STREET)



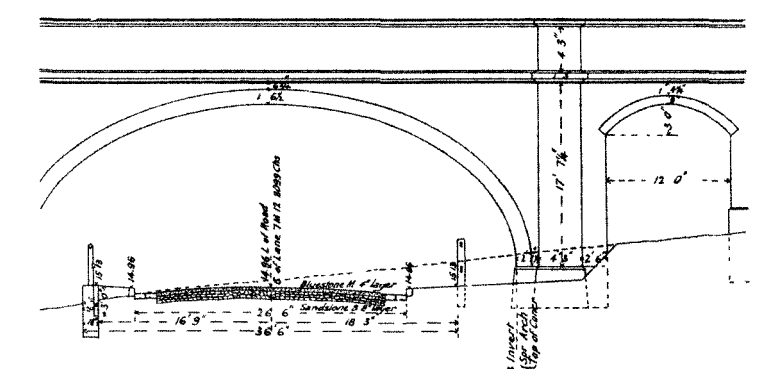
CROSSING AT LANE  
to East of Young St



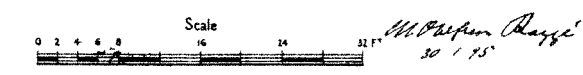
LONGITUDINAL SECTION OF NEW STREET



PLAN OF NEW STREET



CROSS SECTION OF NEW STREET



*W. H. ...*  
30 / 75

# WESTERN SUBURBS SEWERAGE

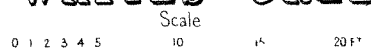
NORTHERN MAIN SEWER 2ND DIVISION

ANNANDALE & LEICHHARDT

## DETAILS OF WHITES CREEK AQUEDUCT

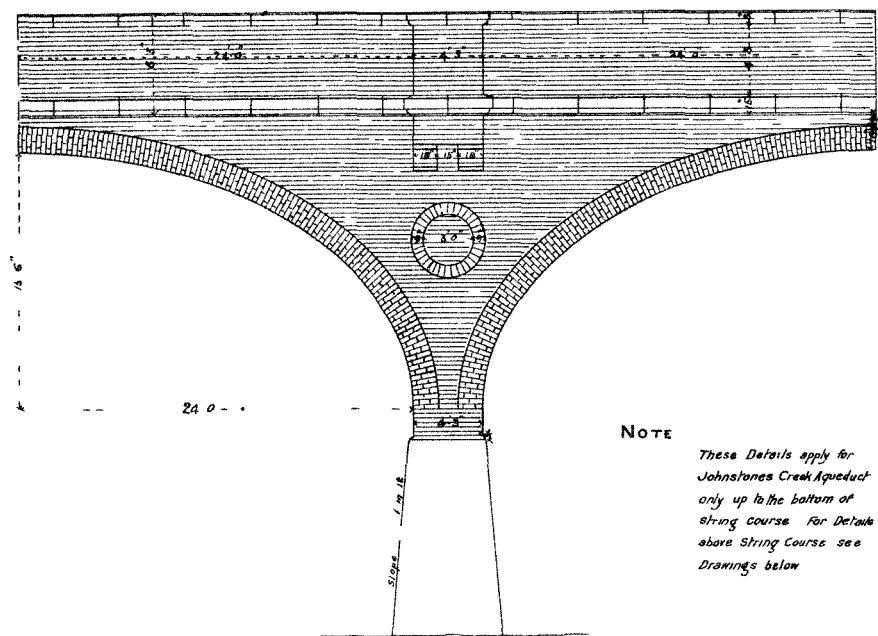
CONTRACT N<sup>o</sup> 77.

DRAWING N<sup>o</sup> 7.



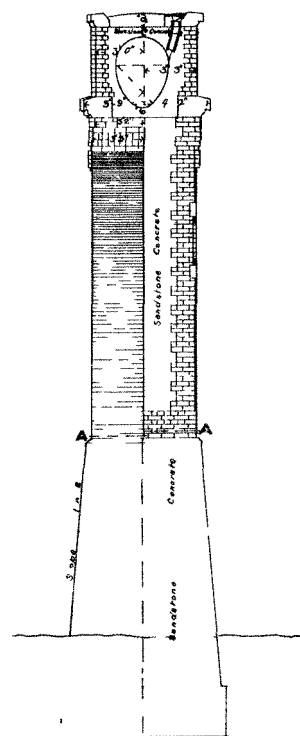
### GENERAL DETAILS OF PIERS AND ARCHES

JOHNSTONE'S CREEK & WHITES CREEK AQUEDUCTS

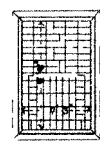


ELEVATION

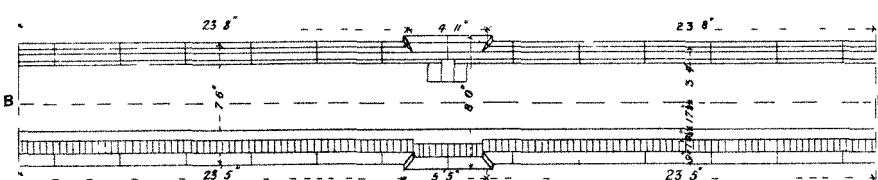
NOTE  
These Details apply for Johnstone's Creek Aqueduct only up to the bottom of string course for details above string course see Drawings below



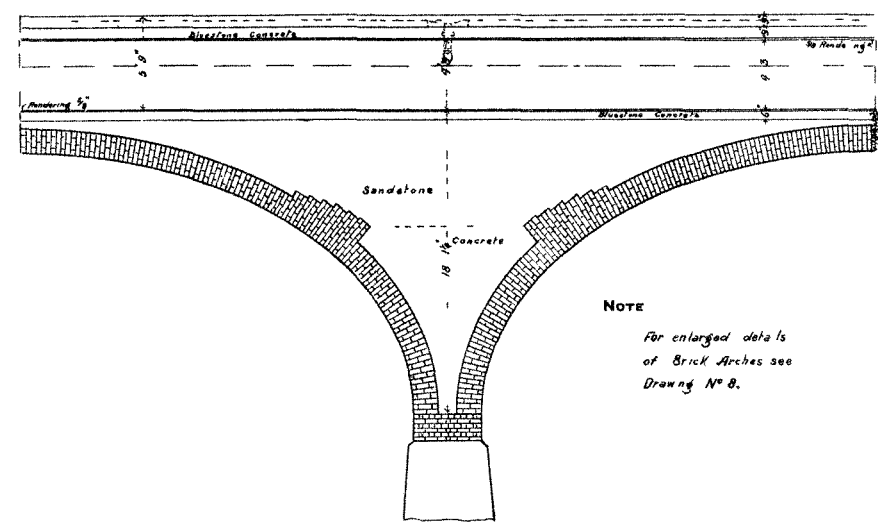
HALF SECTION THRO' CENTRE OF ARCH & PIER



HOR. SECTION ON LINE - A-A

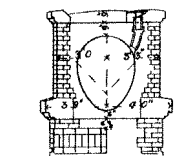


HALF PLAN OF TOP & SECTION AT SPRINGING LINE OF SEWER

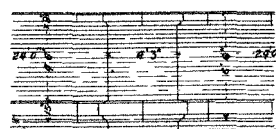


LONGITUDINAL SECTION ON LINE - B-B

NOTE  
For enlarged details of Brick Arches see Drawing N<sup>o</sup> 8.

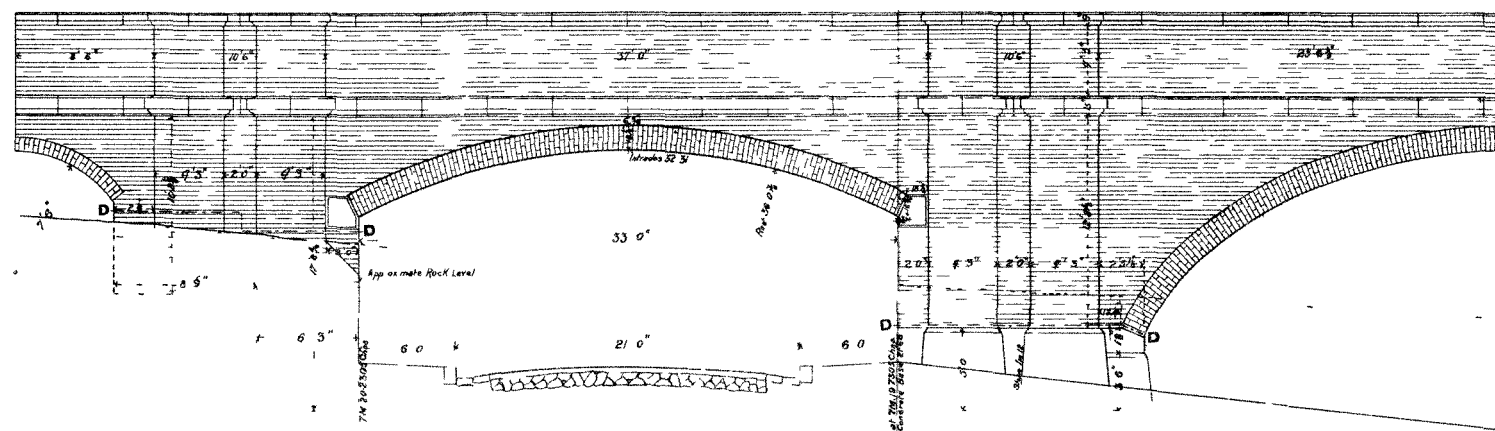


CROSS SECTION ABOVE ARCH  
Johnstone's Creek Aqueduct

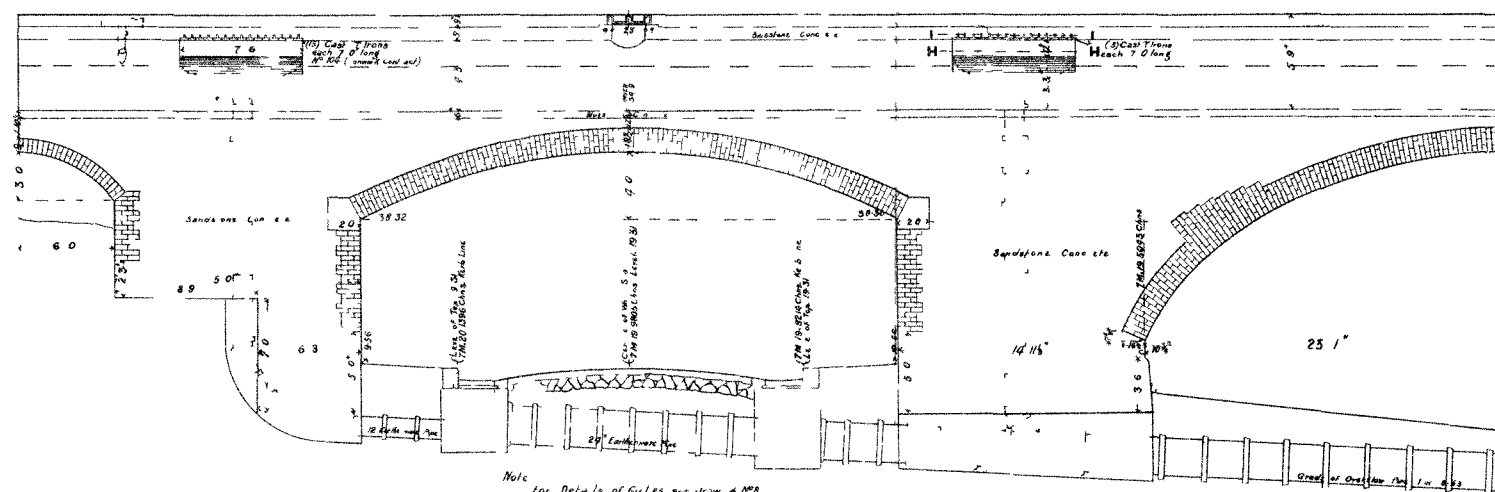


ELEVATION  
Johnstone's Creek Aqueduct

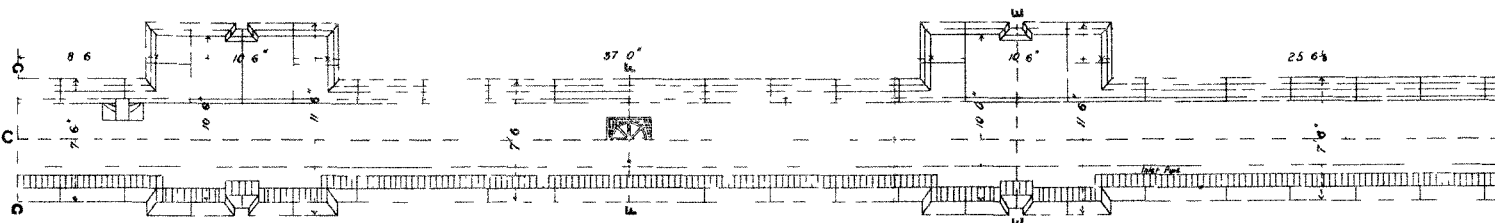
### DETAILS OF CROSSING AT WHITE STREET & ARRANGEMENT OF OVERFLOWS



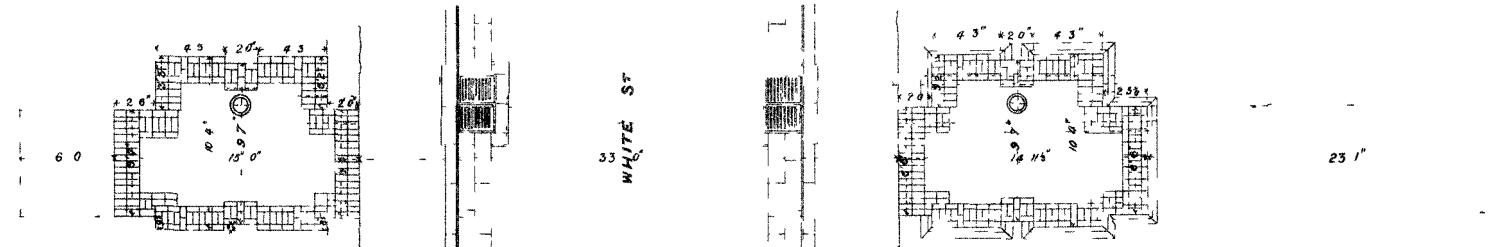
ELEVATION



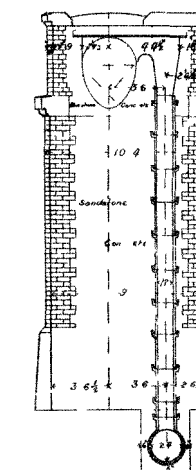
LONGITUDINAL SECTION ON LINE - C-C



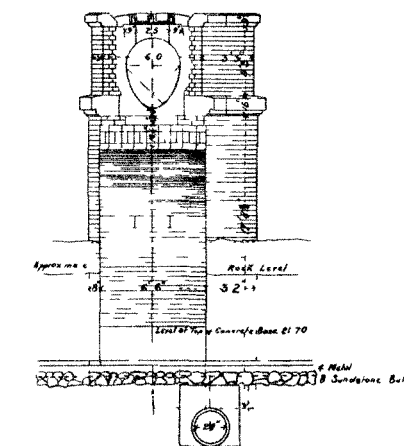
HALF PLAN OF TOP & SECTION AT SPRINGING LINE OF SEWER



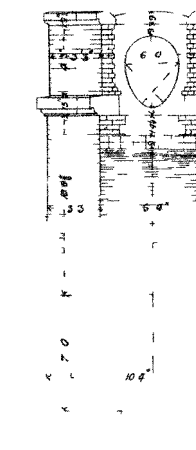
HORIZONTAL SECTION ON LINE - D-D



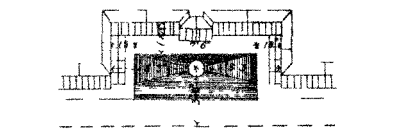
CROSS SECTION ON LINE - E-E



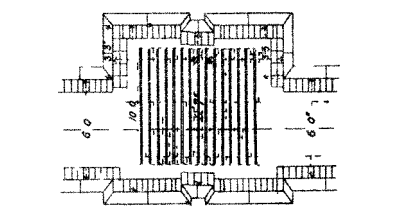
CROSS SECTION ON LINE - F-F



CROSS SECTION ON LINE - G-G



HALF HOR. SECTION ON LINE - H-H



HOR. SECTION ON LINE - I-I

### AQUEDUCT ENDS

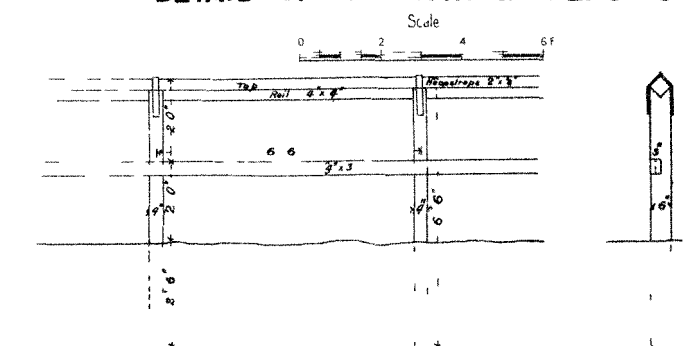


SECTION - J-J

ELEVATION

SECTION - K-K

### DETAIL OF ORDNANCE FENCING



ELEVATION

SECTION

W. Chapman & Co.  
4. 2. 95



# WESTERN SUBURBS SEWERAGE

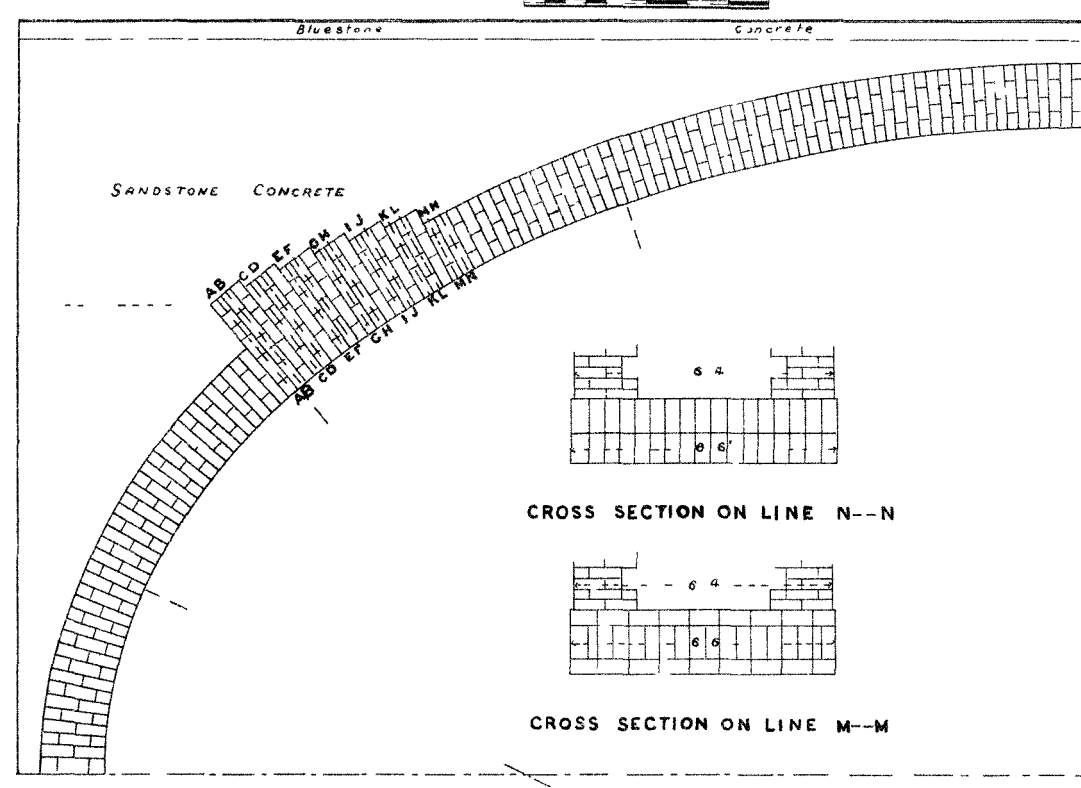
NORTHERN MAIN SEWER 2<sup>ND</sup> DIVISION

ANNANDALE & LEICHHARDT

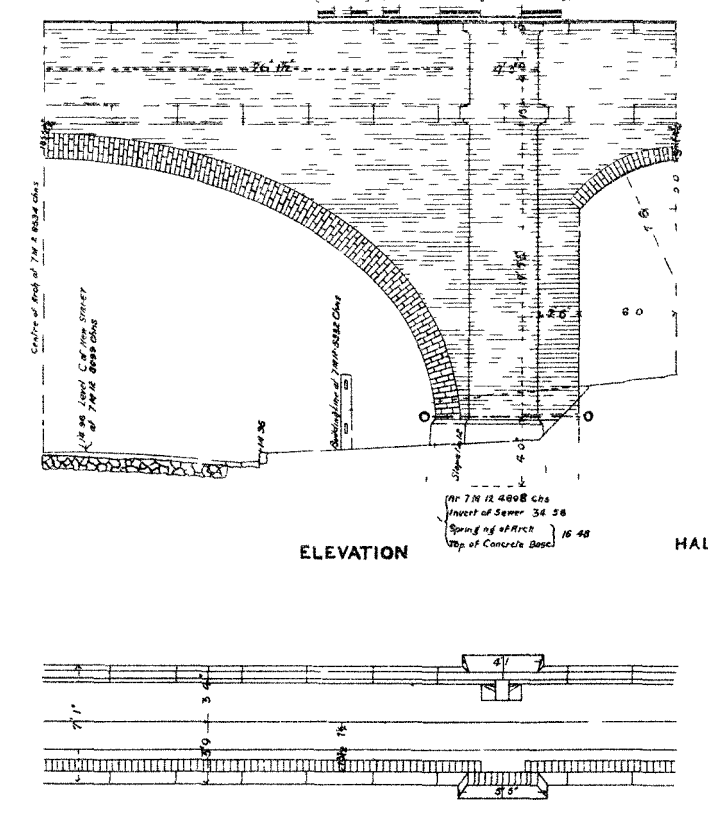
## DETAILS OF WHITES CREEK & JOHNSTONES CREEK AQUEDUCTS

CONTRACT NO. 77  
DRAWING NO. 8

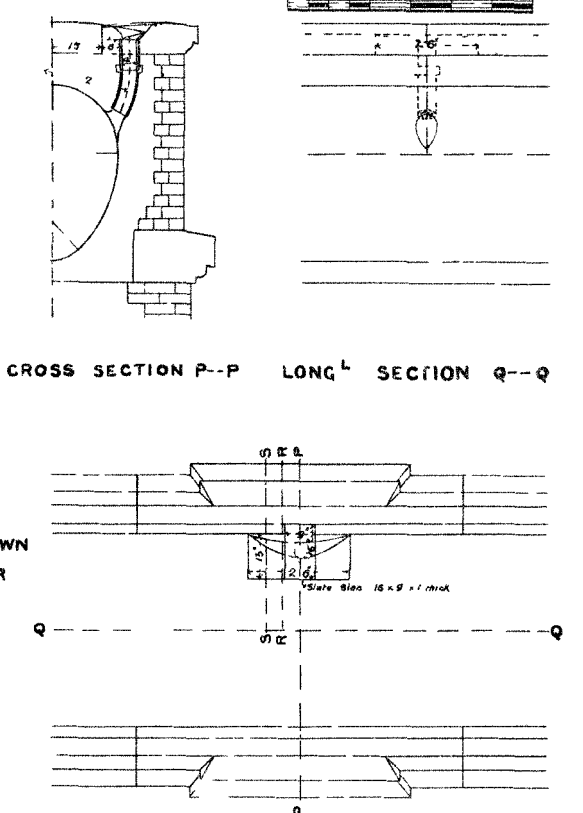
### DETAILS OF BRICKWORK FOR ARCHES



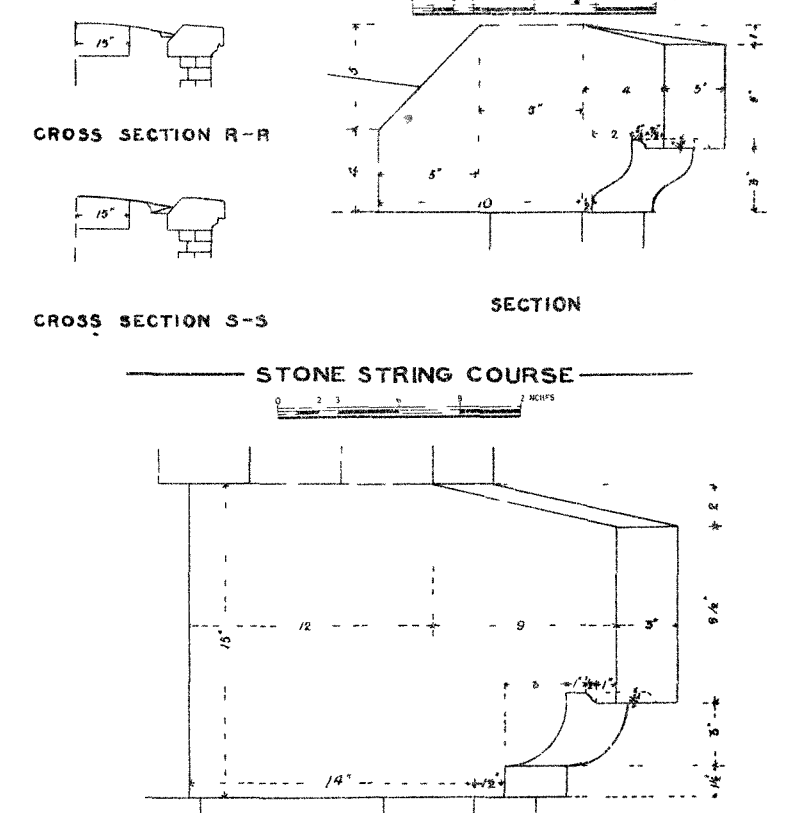
### EASTERN PIER & CHANGE IN SIZE OF ARCHES



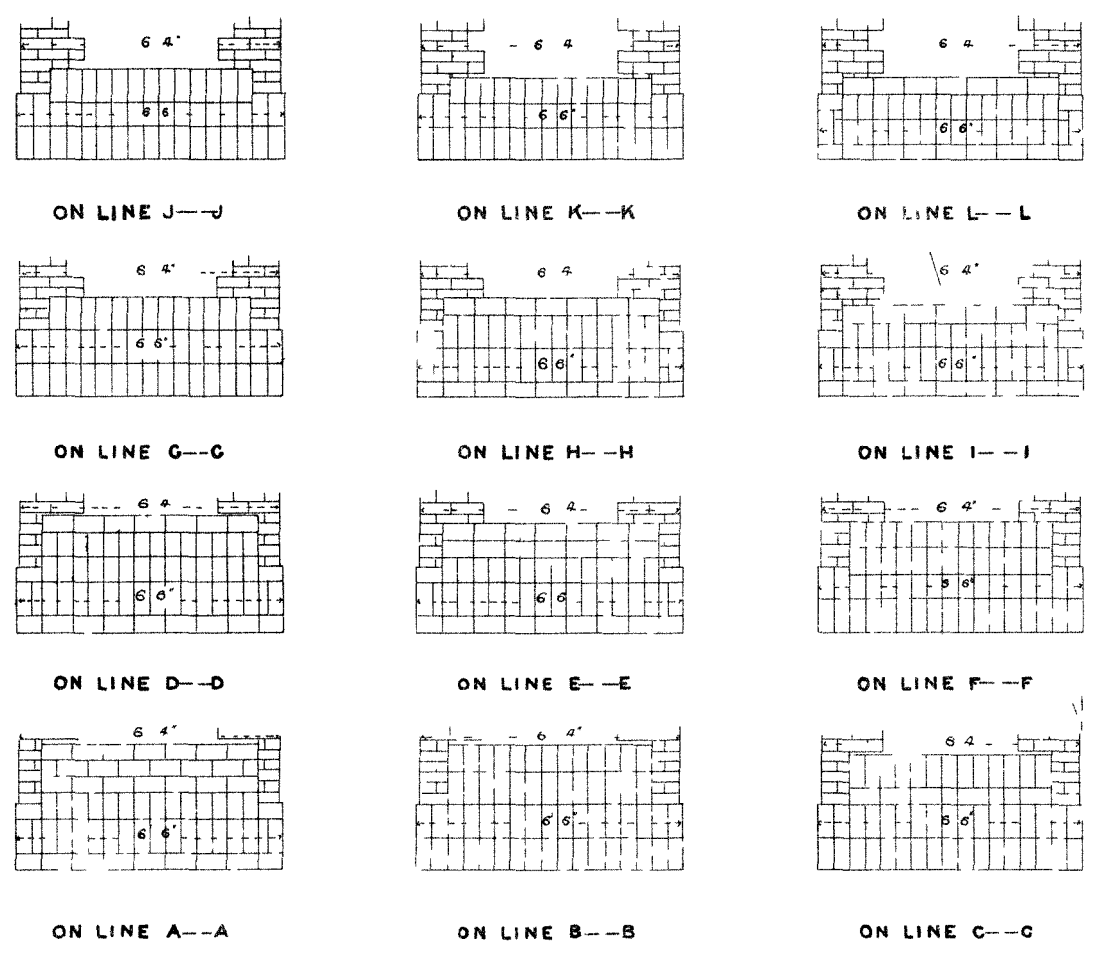
### DETAILS OF INLET PIPES



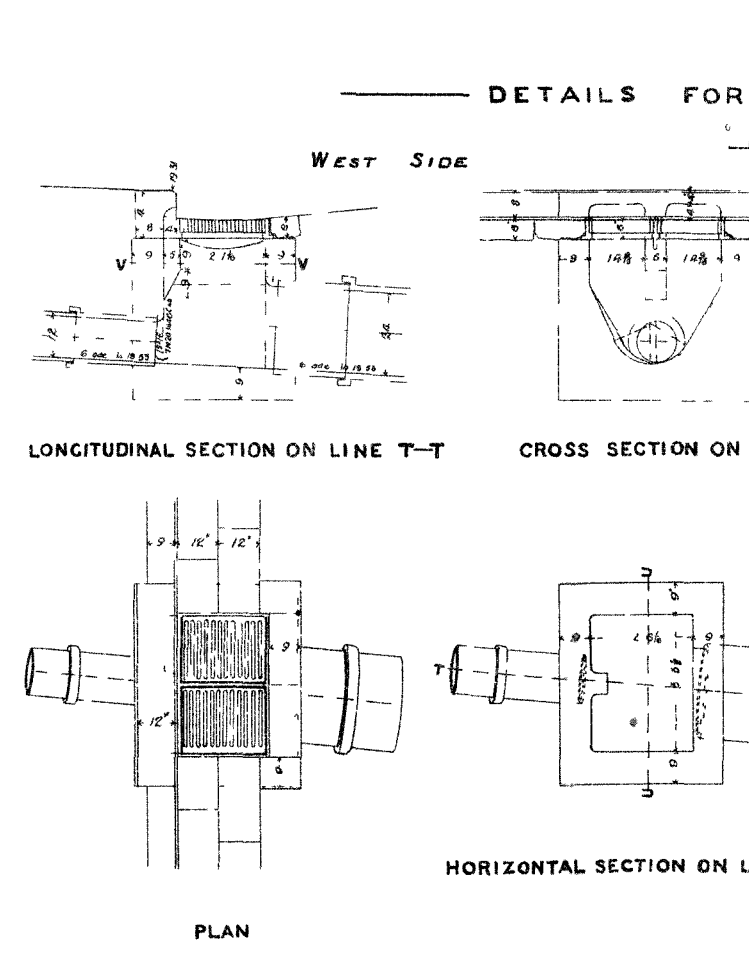
### STONE COPING



### CROSS SECTIONS OF ARCH



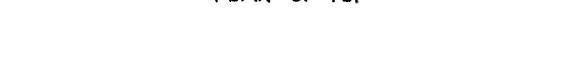
### HALF PLAN OF TOP & HORIZONTAL SECTION AT SPRINGING LINE OF SEWER



### HOR. SECTION ON LINE O--O

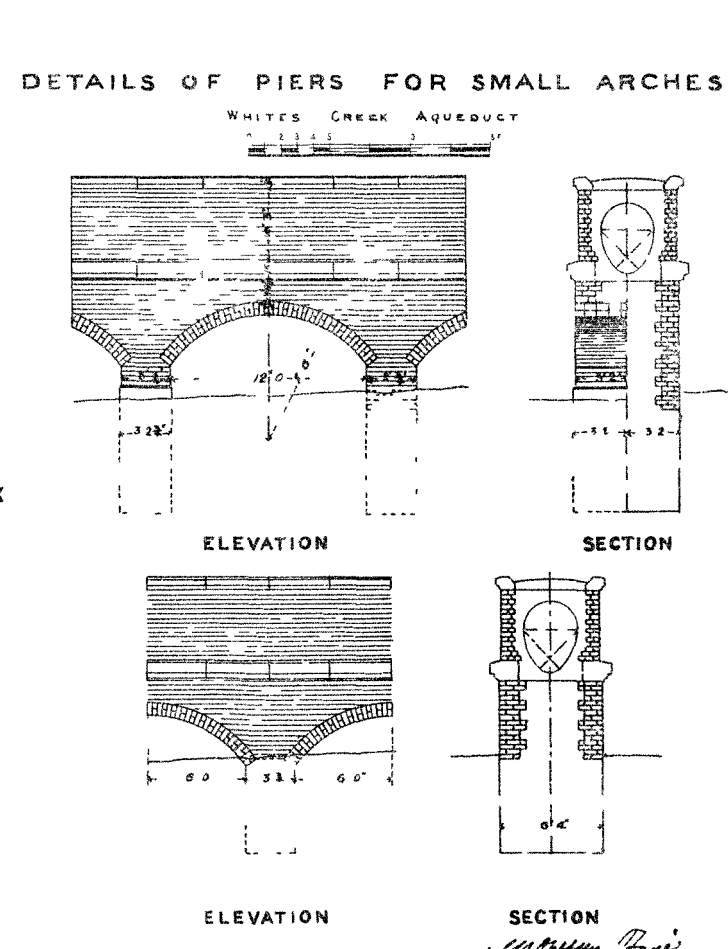


### PLAN OF TOP

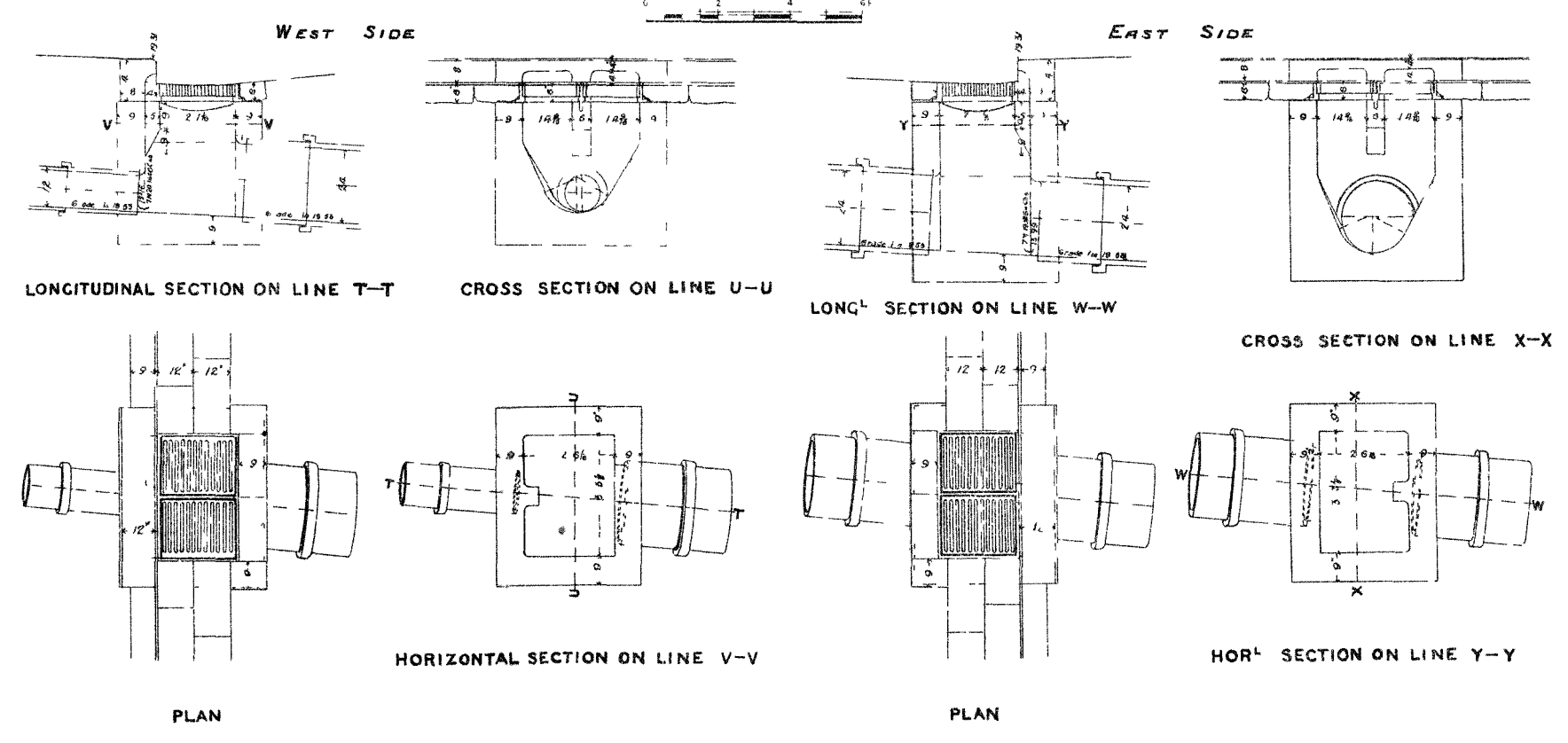


### SECTION

### DETAILS OF PIERS FOR SMALL ARCHES



### DETAILS FOR WHITE STREET GULLIES



1/25/11

W. H. R. [Signature]



# White's Creek and Johnstone's Creek Aqueducts

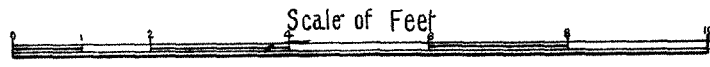
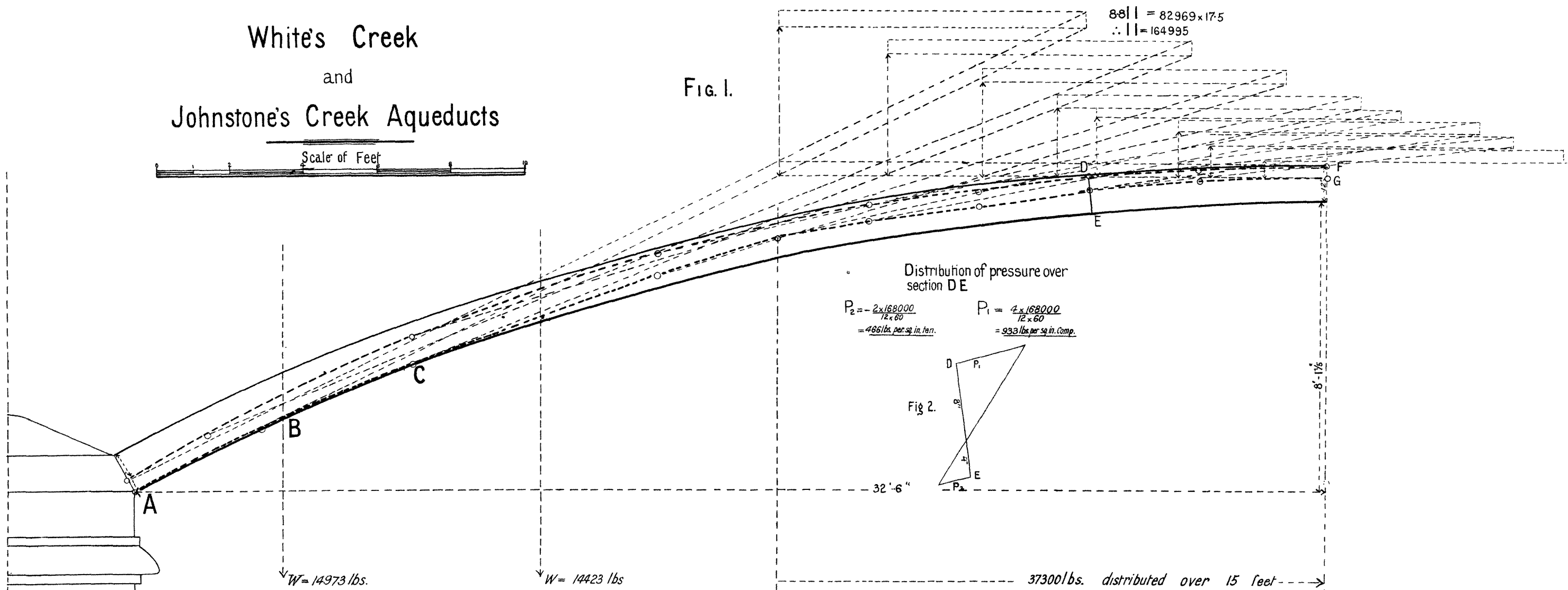


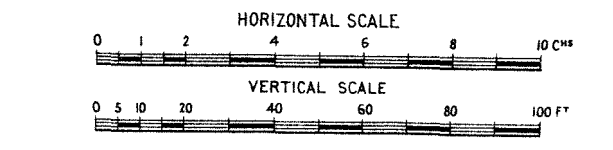
FIG. I.



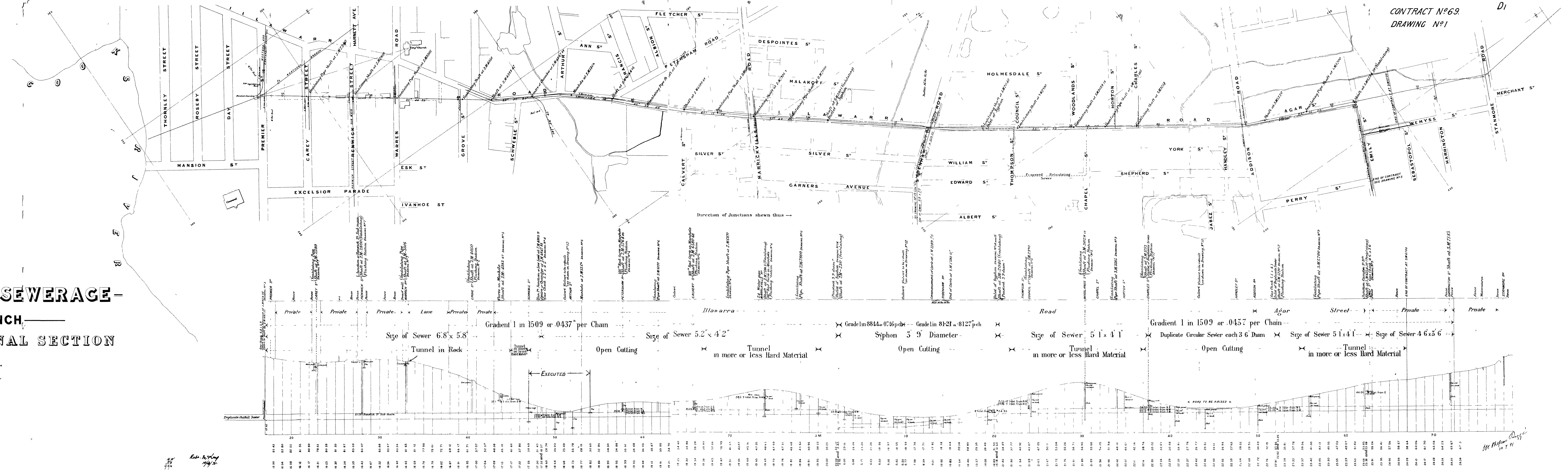
| N <sup>o</sup> of Vous | width | weight   | lever arm | moments | Σ weights | Σ moments | lever arms |
|------------------------|-------|----------|-----------|---------|-----------|-----------|------------|
| 1                      | 3.30  | 8910.00  | 1.70      | 15147   | 8910      | 15147     | 1.70       |
| 2                      | 3.00  | 8100.00  | 5.00      | 40500   | 17010     | 55647     | 3.20       |
| 3                      | 3.00  | 8100.00  | 8.00      | 64800   | 25110     | 120447    | 4.10       |
| 4                      | 3.00  | 8100.00  | 11.00     | 89100   | 33210     | 209547    | 6.30       |
| 5                      |       | 5940.00  | 13.70     | 81378   | 39150     | 290925    | 7.40       |
| 6                      |       | 14423.00 | 14.90     | 214903  | 53573     | 505828    | 9.40       |
| 7                      |       | 14423.00 | 21.50     | 310094  | 67996     | 815922    | 12.0       |
| 8                      |       | 14973.00 | 28.50     | 426730  | 82969     | 1242652   | 15.0       |
| Total weight           |       | 82969    |           | 1242652 |           |           |            |

(Sig. 140-)

**- WESTERN SUBURBS SEWERAGE -**  
**EASTERN BRANCH**  
**PLAN AND LONGITUDINAL SECTION**



(See 140-)



*W. H. H. 1/11*



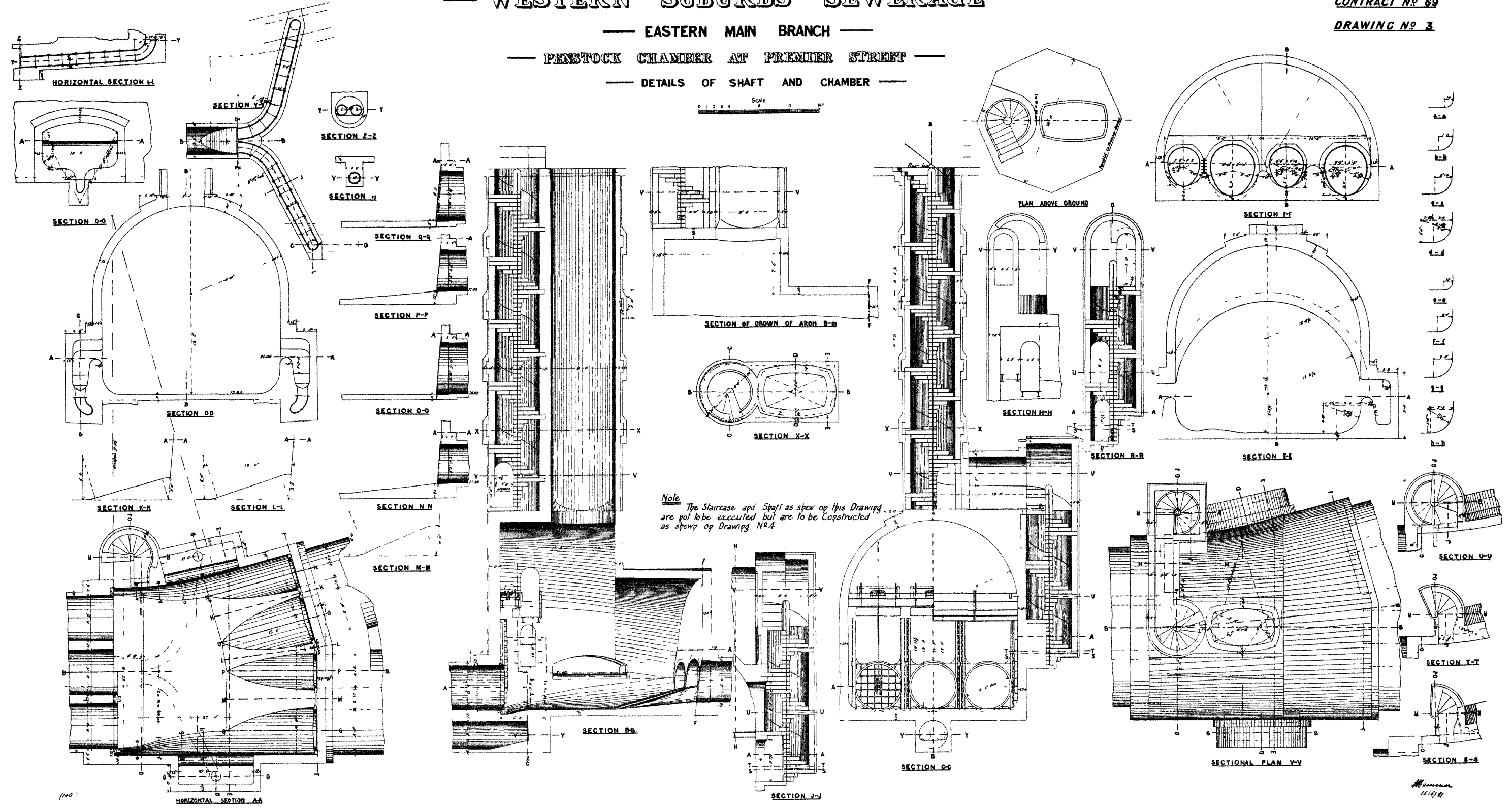
# — WESTERN SUBURBS SEWERAGE —

CONTRACT No. 69 <sup>D'</sup>  
DRAWING No. 3

— EASTERN MAIN BRANCH —

— PENSTOCK CHAMBER AT PREMIER STREET —

— DETAILS OF SHAFT AND CHAMBER —



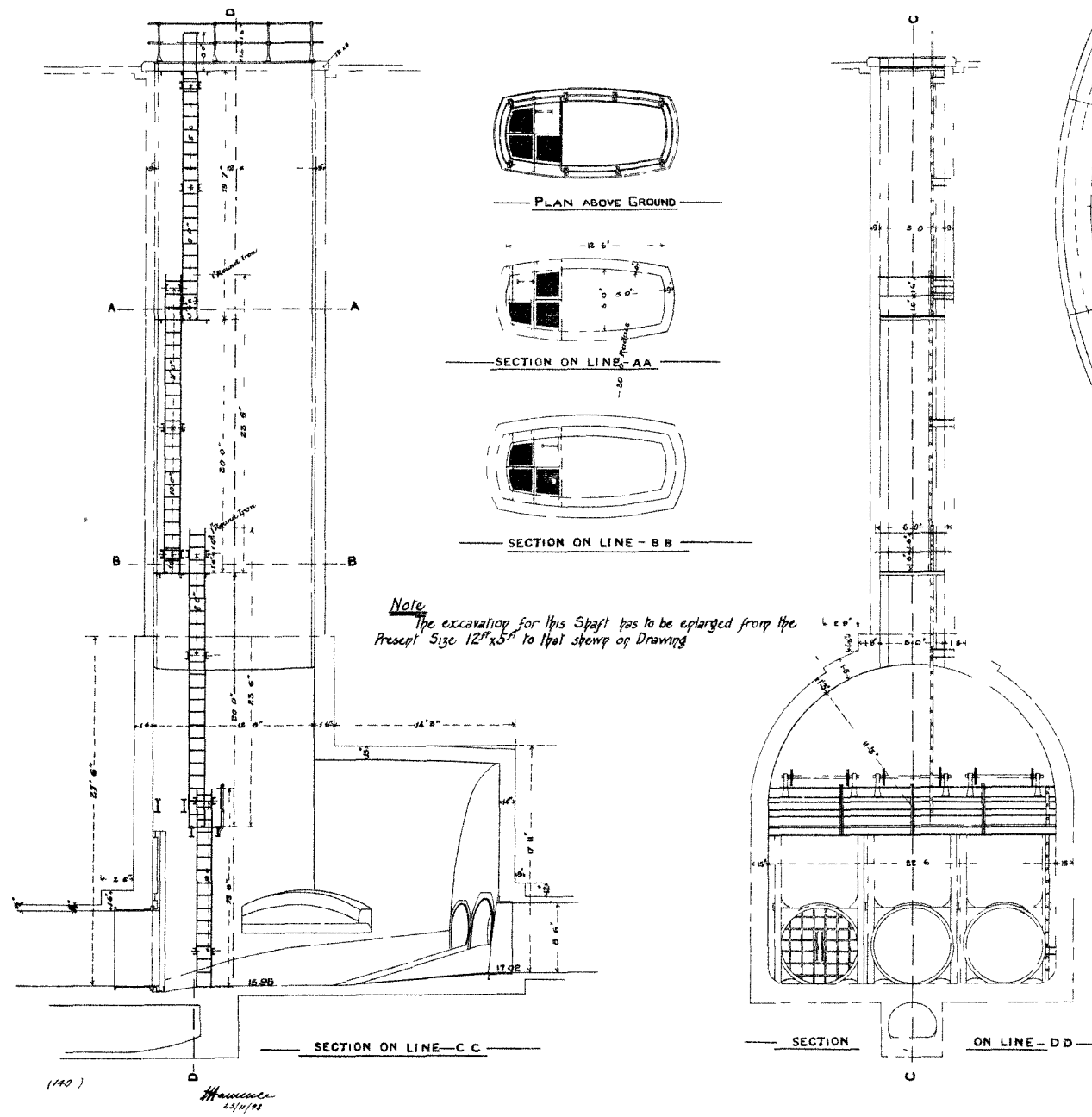
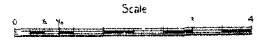
*Handwritten signature and date*  
1894

# WESTERN SUBURBS SEWERAGE

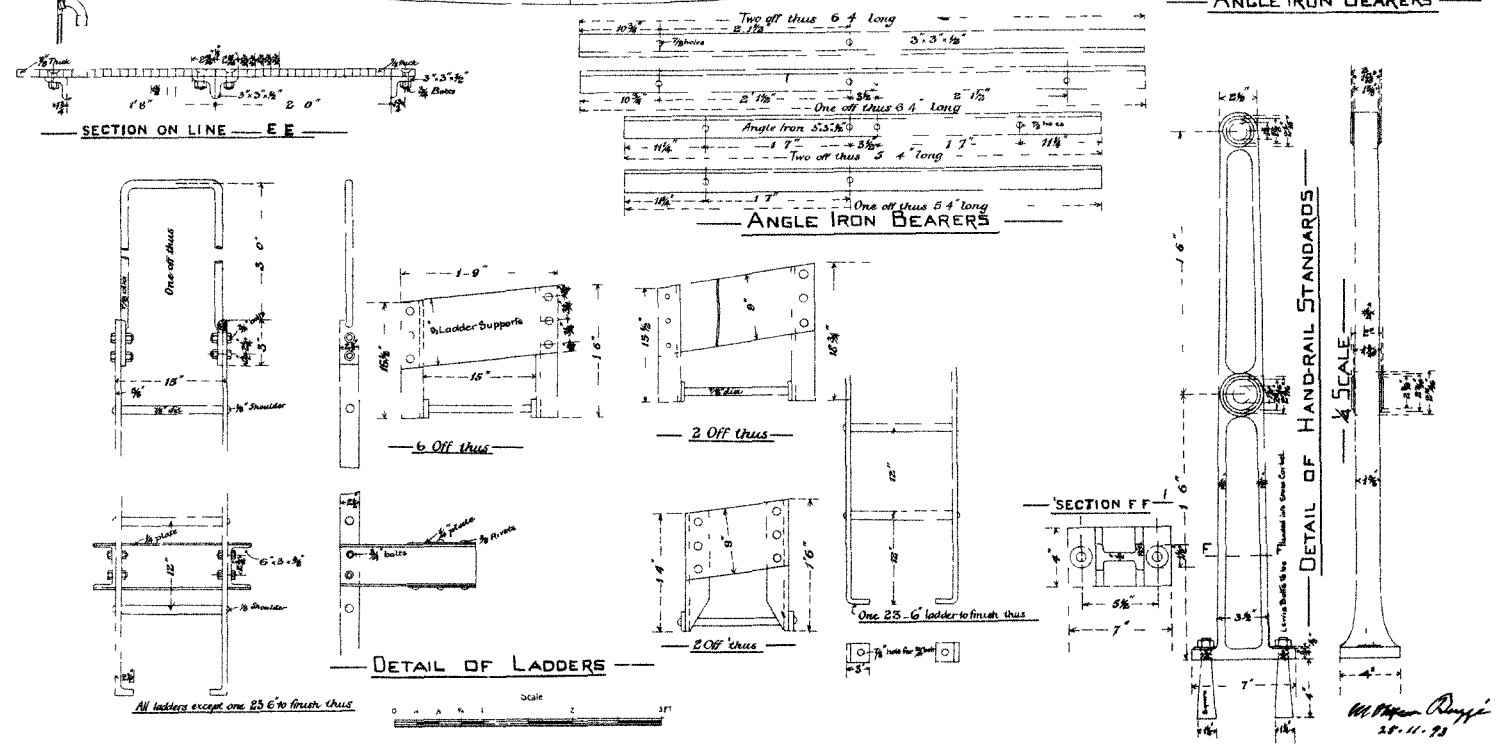
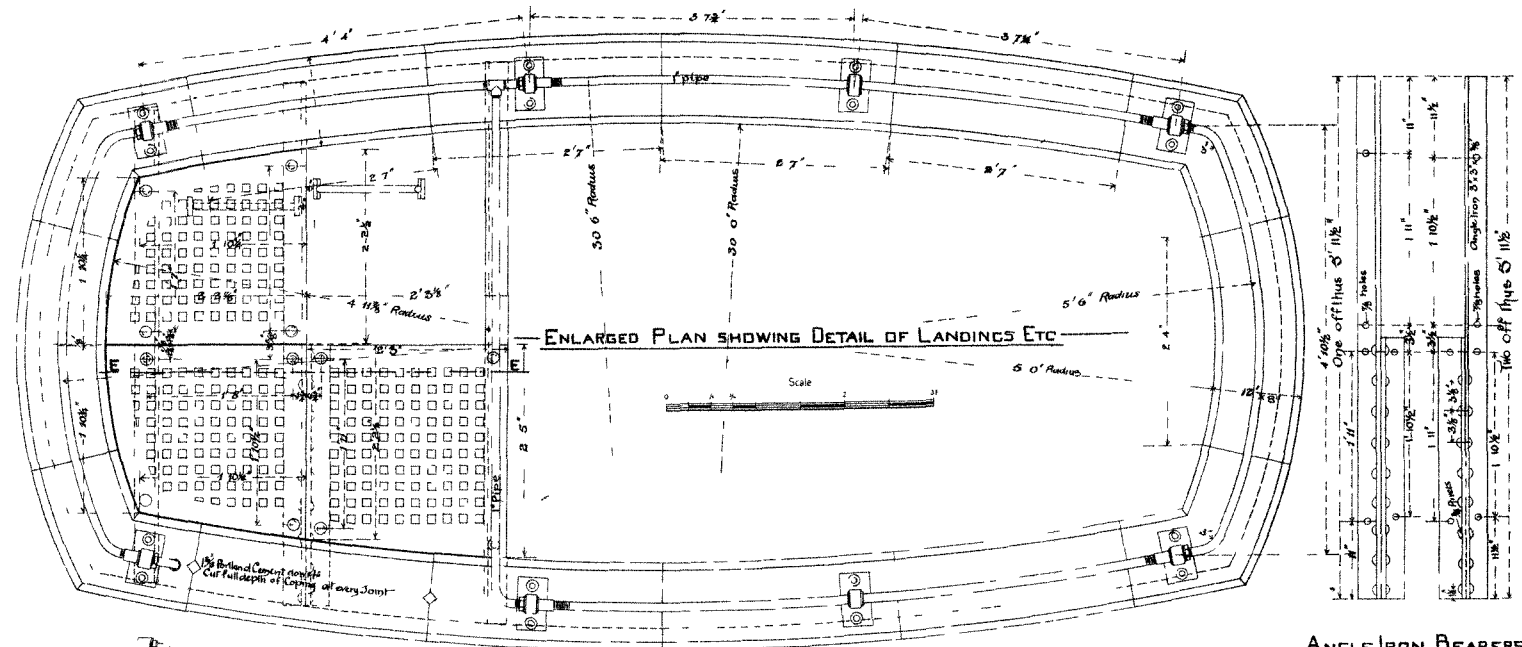
## EASTERN MAIN BRANCH

### ALTERATIONS TO PENSTOCK CHAMBER AND SHAFT AT PREMIER STREET

D2  
CONTRACT N<sup>o</sup> 69  
DRAWING N<sup>o</sup> 4.



Note  
The excavation for this Shaft has to be enlarged from the Present Size 12' 5 1/2" to that shown on Drawing



(140)  
H. M. R. 21/11/22

H. M. R. 21/11/22

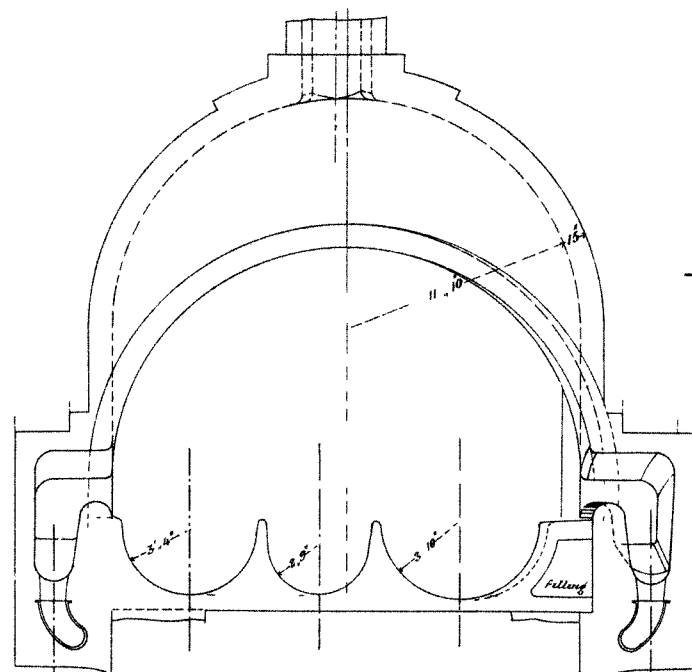
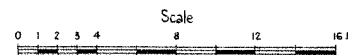
# WESTERN SUBURBS SEWERAGE

## EASTERN MAIN BRANCH

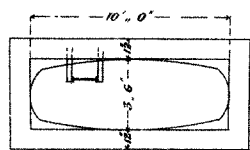
### PENSTOCK CHAMBER AT PREMIER STREET REVISED DETAILS OF SHAFT AND CHAMBER

CONTRACT NO 69  
DRAWING NO 4<sup>a</sup>

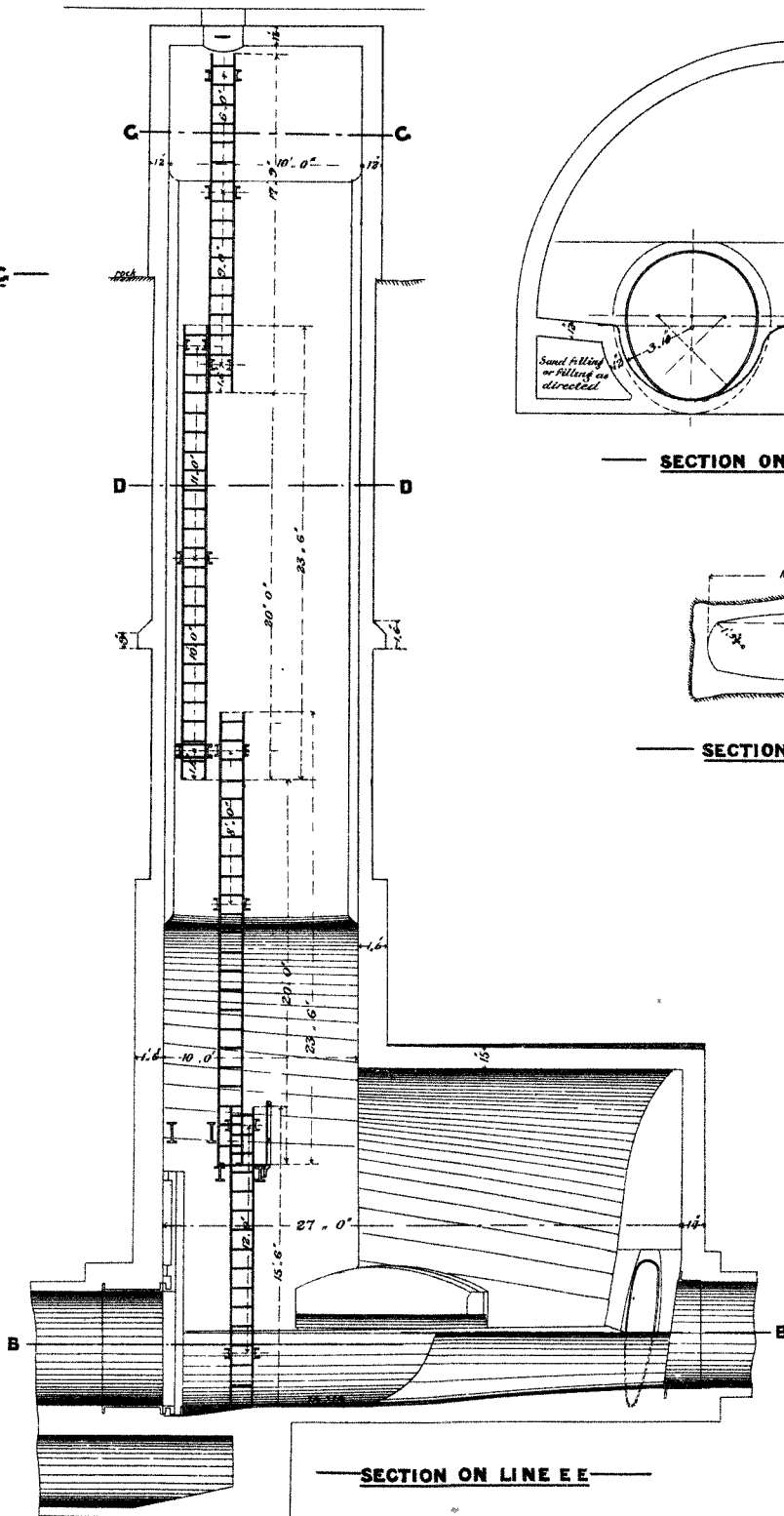
D<sup>3</sup>



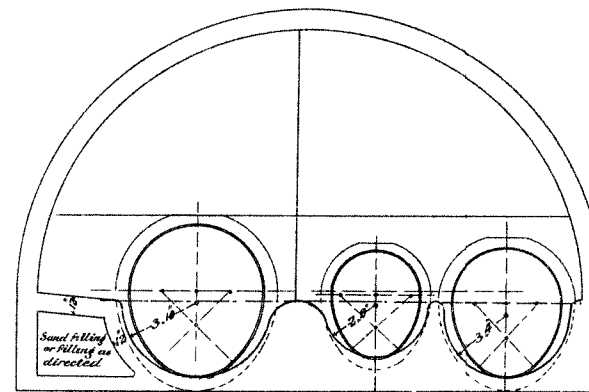
SECTION ON LINE A A



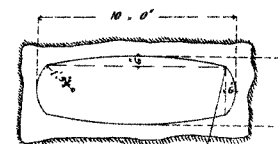
SECTION ON LINE C C



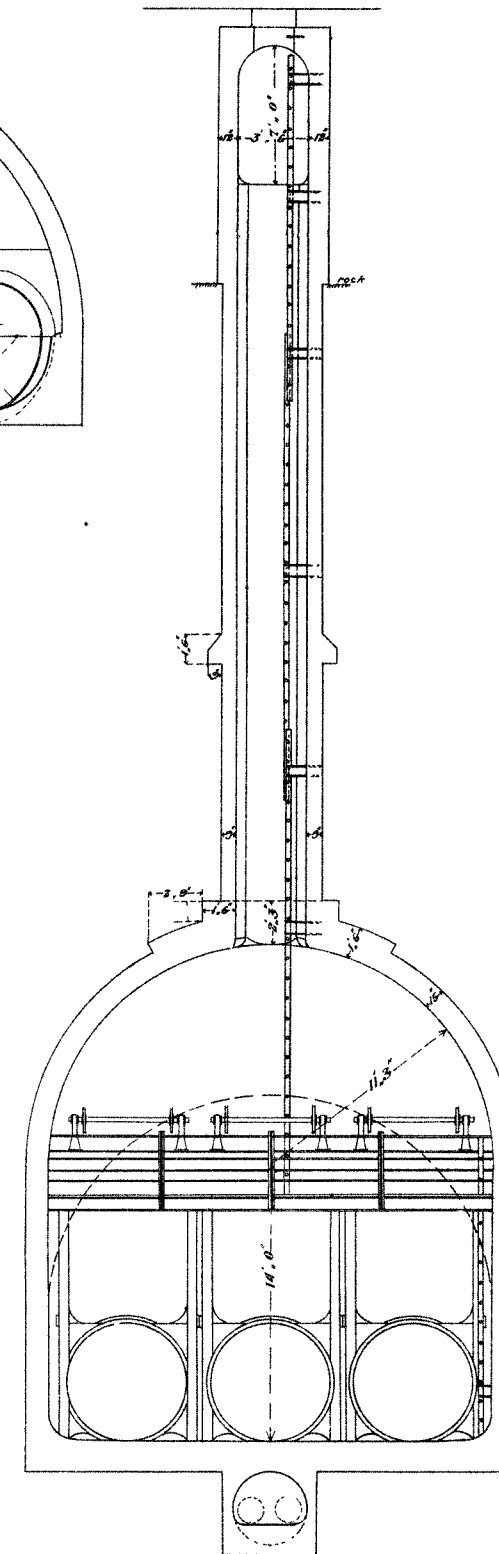
SECTION ON LINE E E



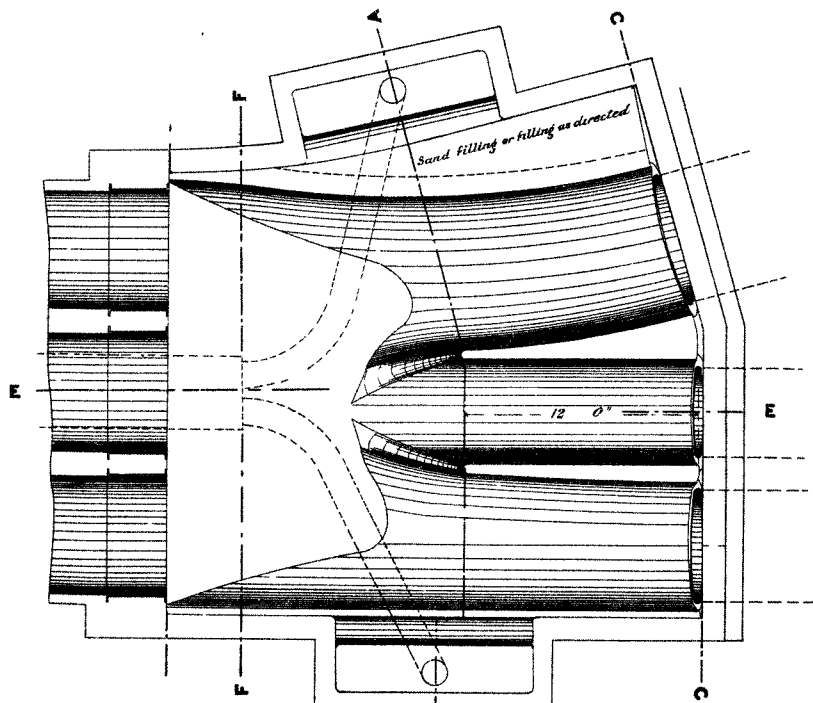
SECTION ON LINE C C



SECTION ON LINE D D



SECTION ON LINE F F



SECTION ON LINE B B

(140-)

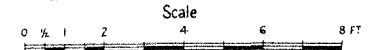


# WESTERN SUBURBS SEWERAGE

## EASTERN MAIN BRANCH

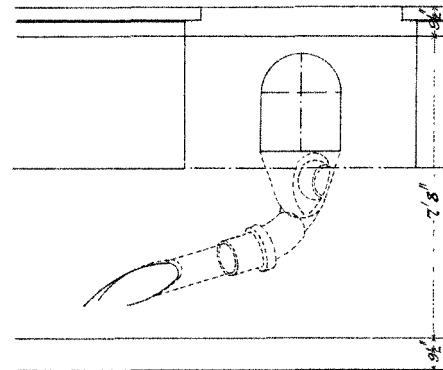
### DETAILS OF SHAFTS INLETS & C

CONTRACT NO. 69  
DRAWING NO. 31

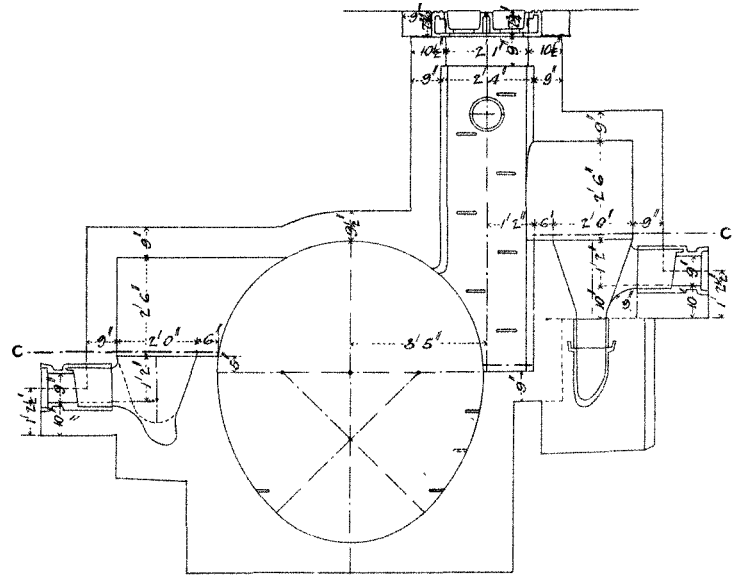


SHAFT AT 2M 24.8933 CHS  
& JUNCTIONS AT { 2 M 24.8933 CHS  
                  2 M 23.4200 CHS

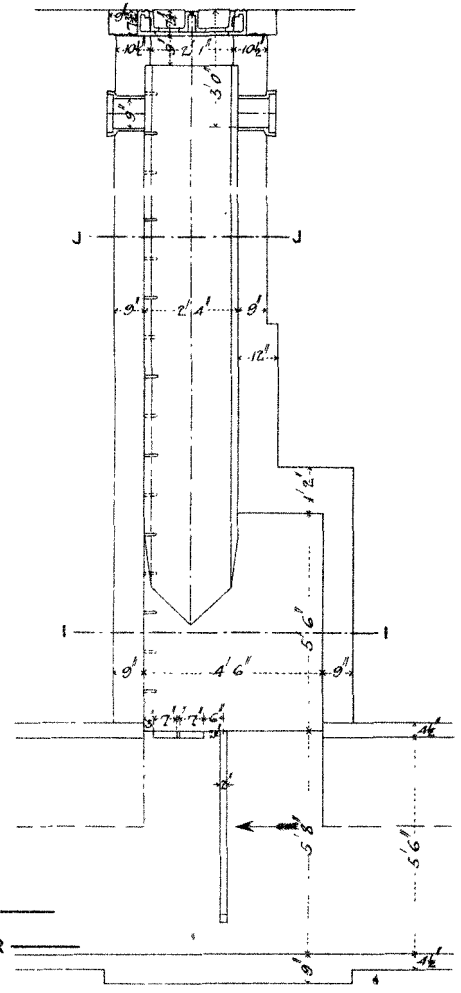
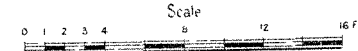
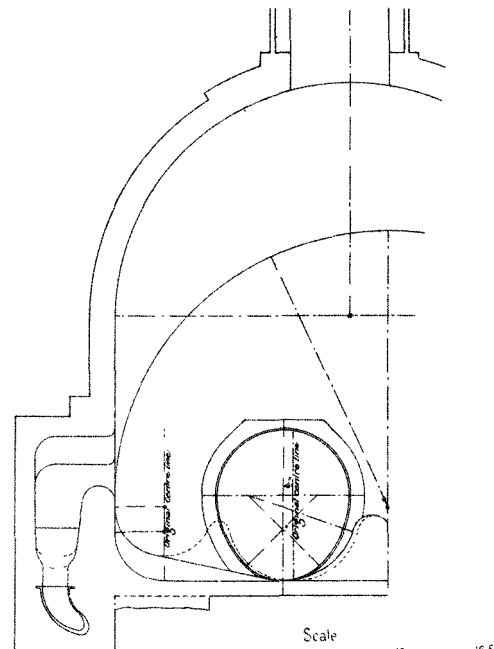
ALTERATION TO PENSTOCK CHAMBER PREMIER ST  
7'8" x 6'8" SEWER SUBSTITUTED IN LIEU OF 6'10" x 5'10" & 5'2" x 4'2"



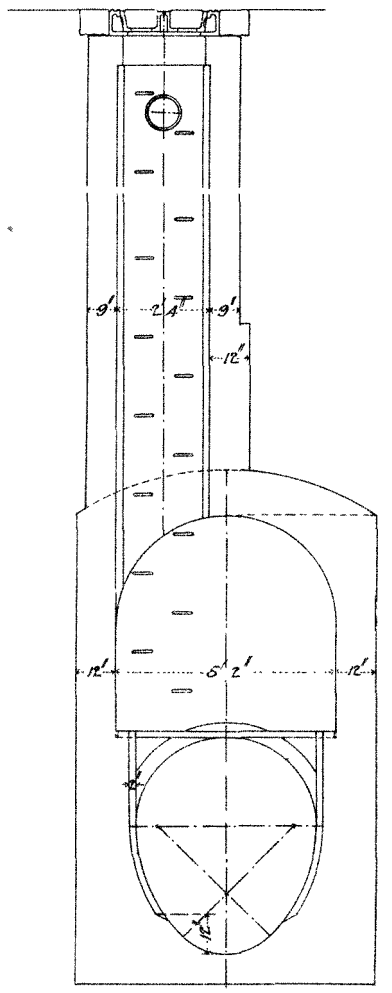
LONGITUDINAL SECTION ON LINE-A-A



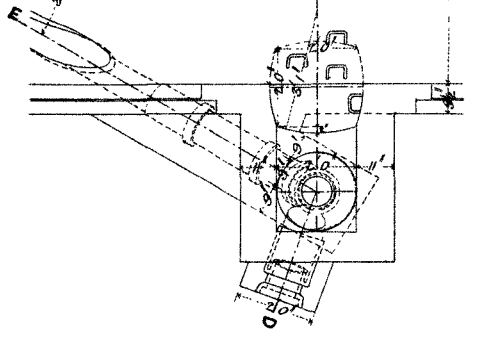
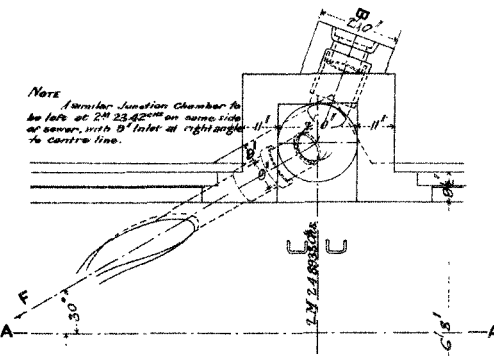
CROSS SECTION ON LINE-B-D



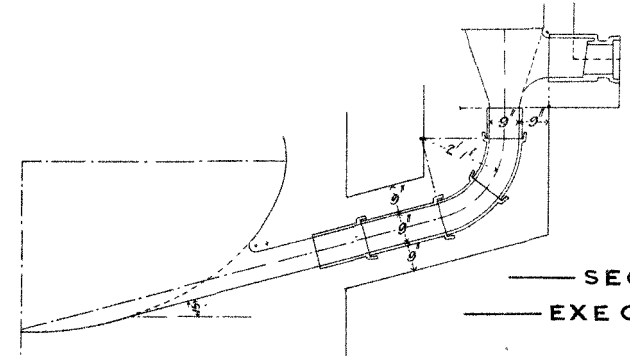
LONGITUDINAL SECTION ON LINE-C-C



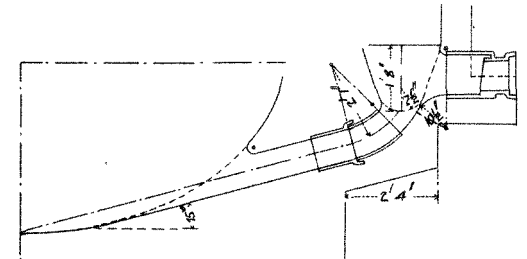
CROSS SECTION ON LINE-H-H



HORIZONTAL SECTION ON LINE-C-C

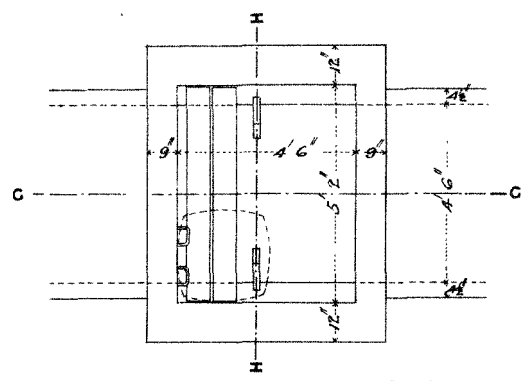
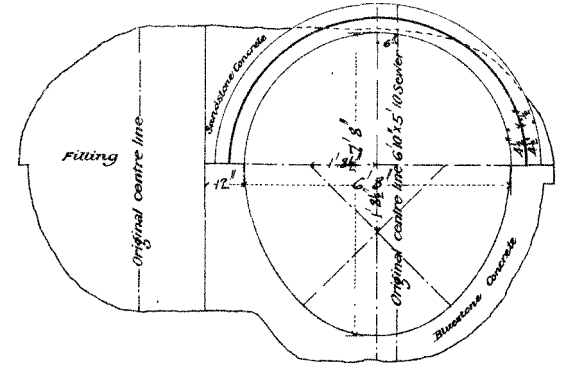


SECTION ON LINE-E-D

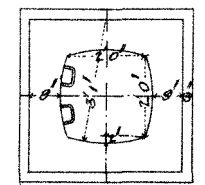


SECTION ON LINE-F-B

SECTION SHEWING EXCAVATION AS EXECUTED & POSITION OF 7'8" x 6'8" SEWER



HORIZONTAL SECTION ON LINE-I-I



SECTION ON LINE-J-J

*W. Wilson Duffie*  
22.11.24

# WESTERN SUBURBS SEWERAGE

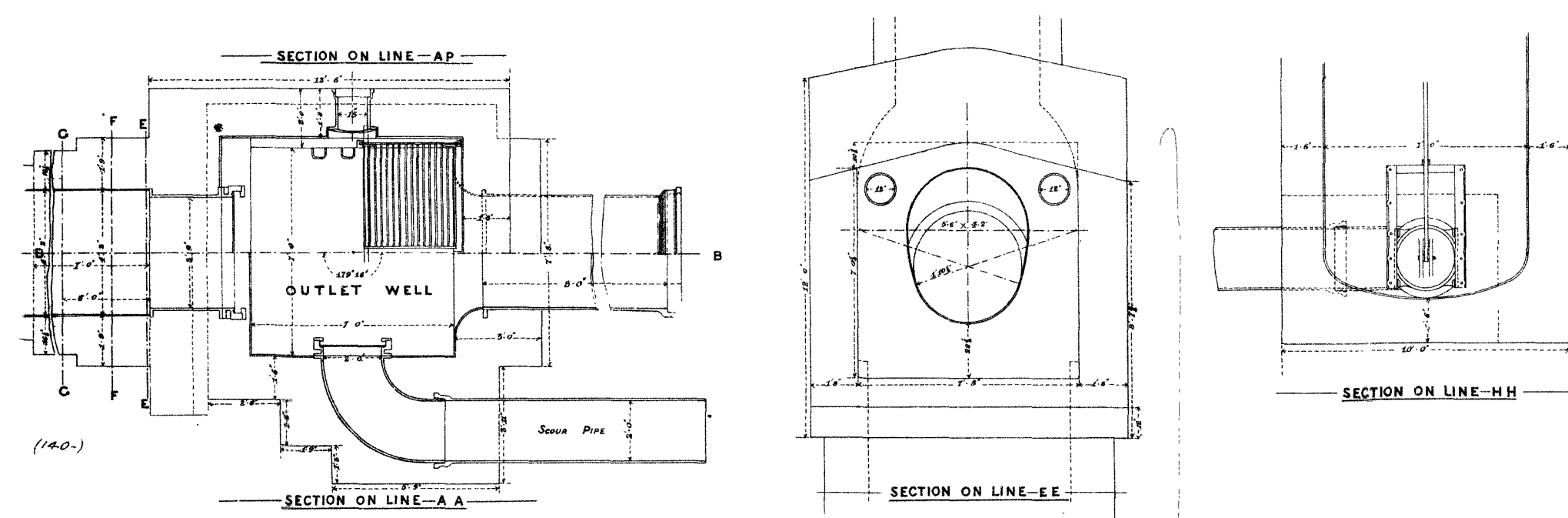
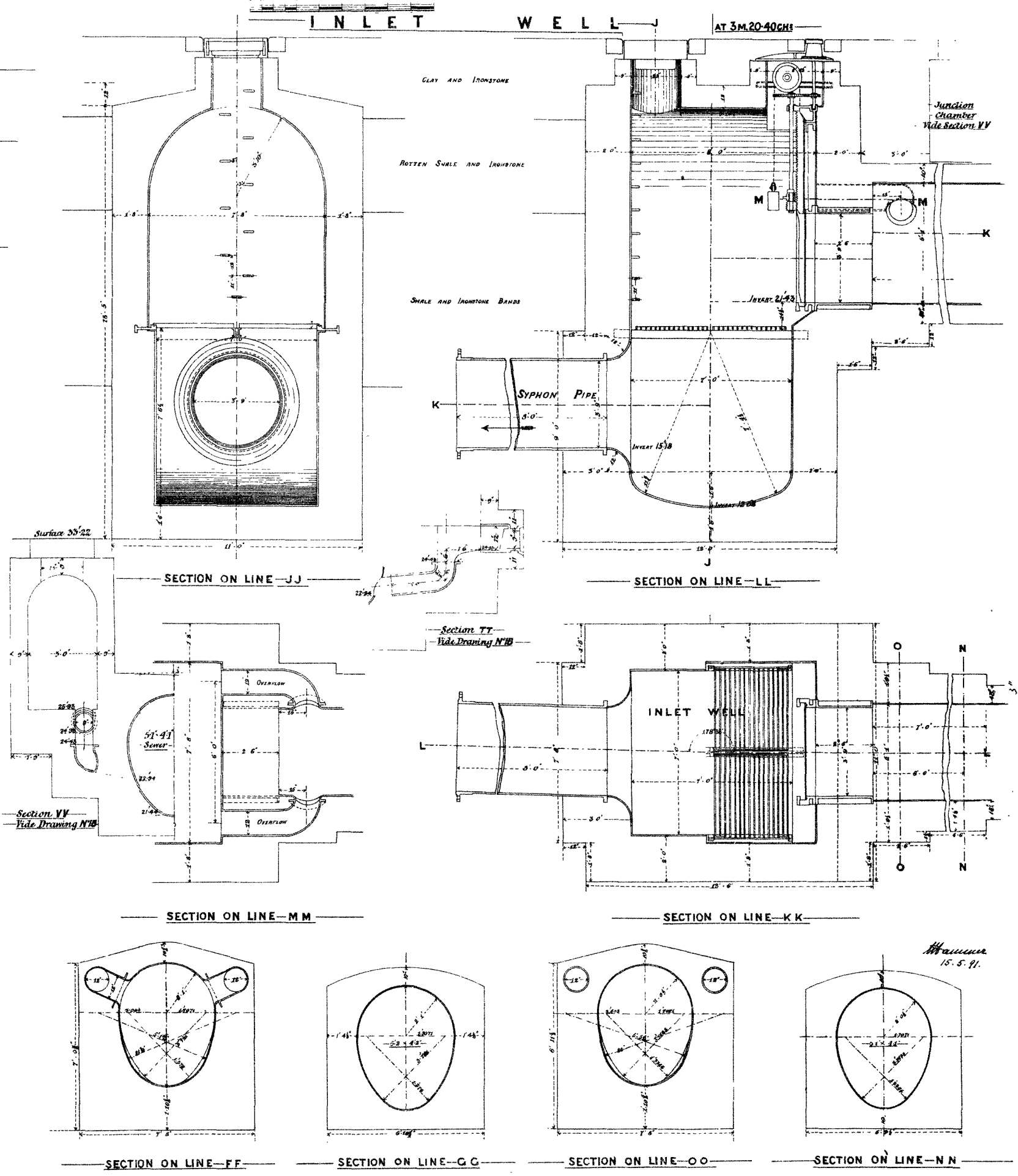
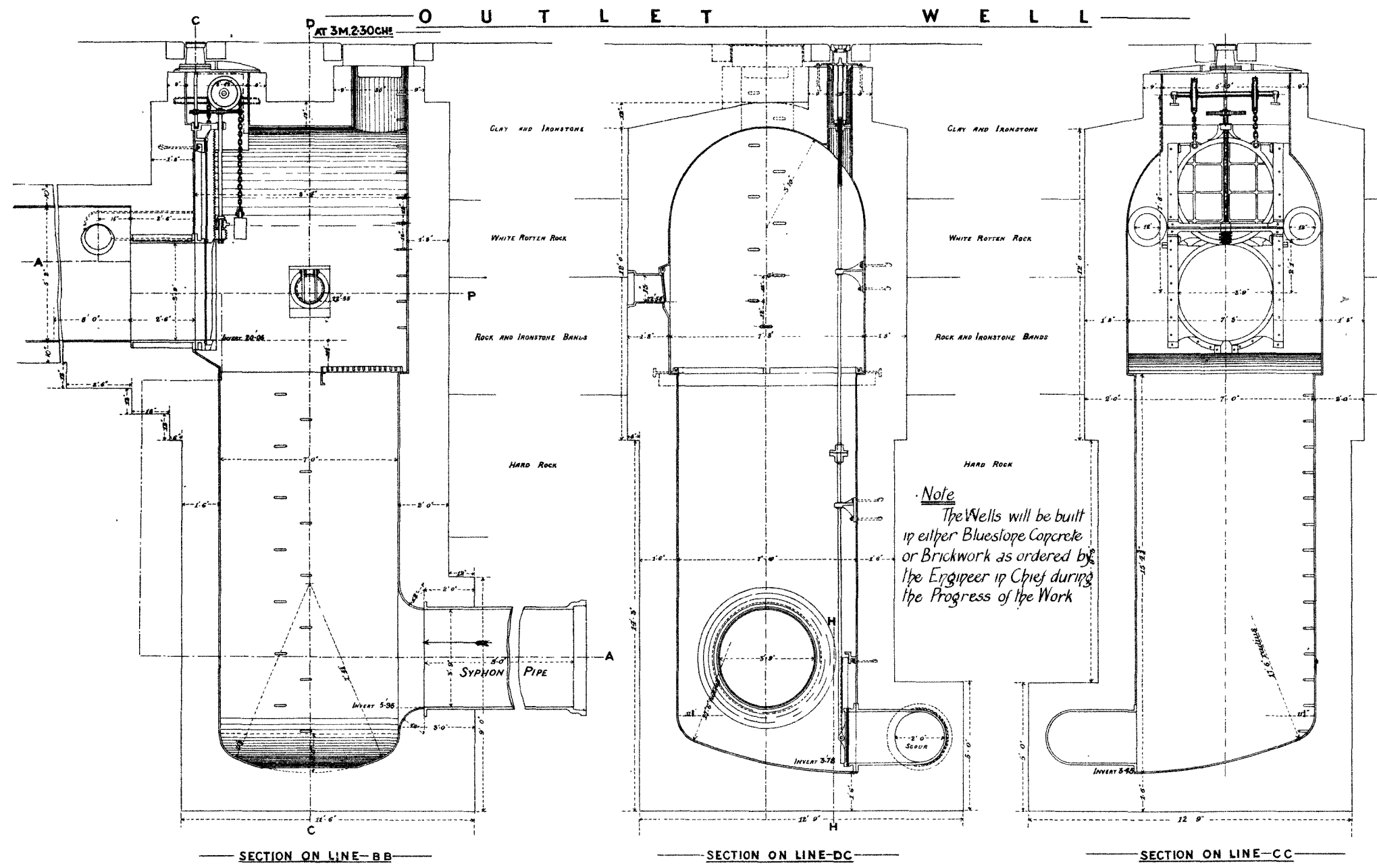
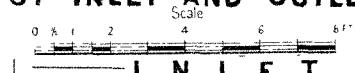
CONTRACT No 69  
DRAWING No 14

D<sup>5</sup>

## EASTERN MAIN BRANCH

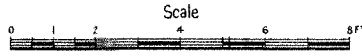
### SYPHON ILLAWARRA ROAD

#### DETAILS OF INLET AND OUTLET WELL



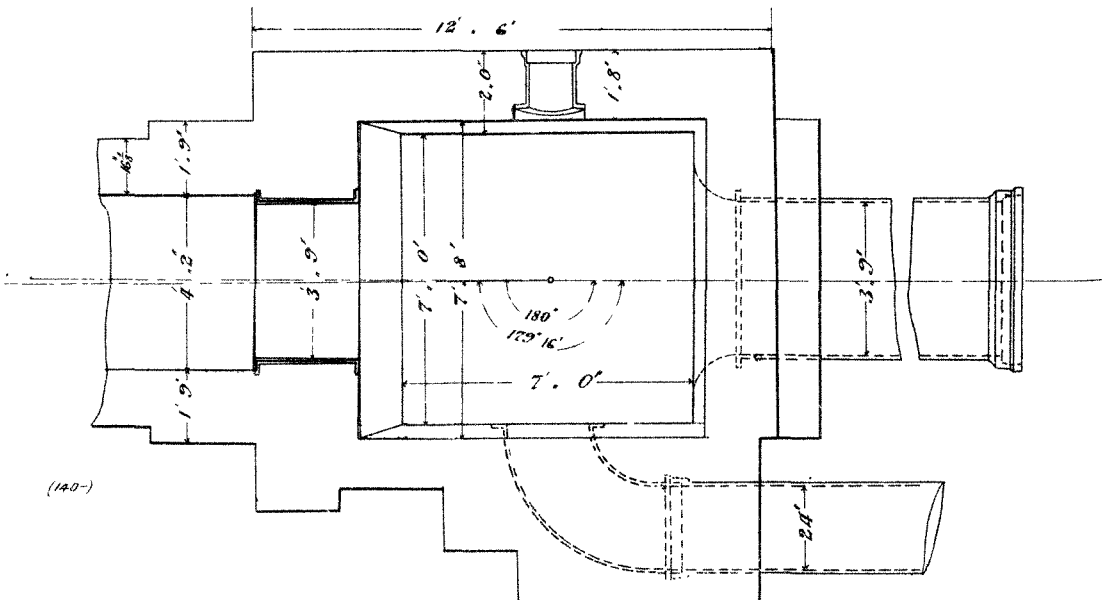
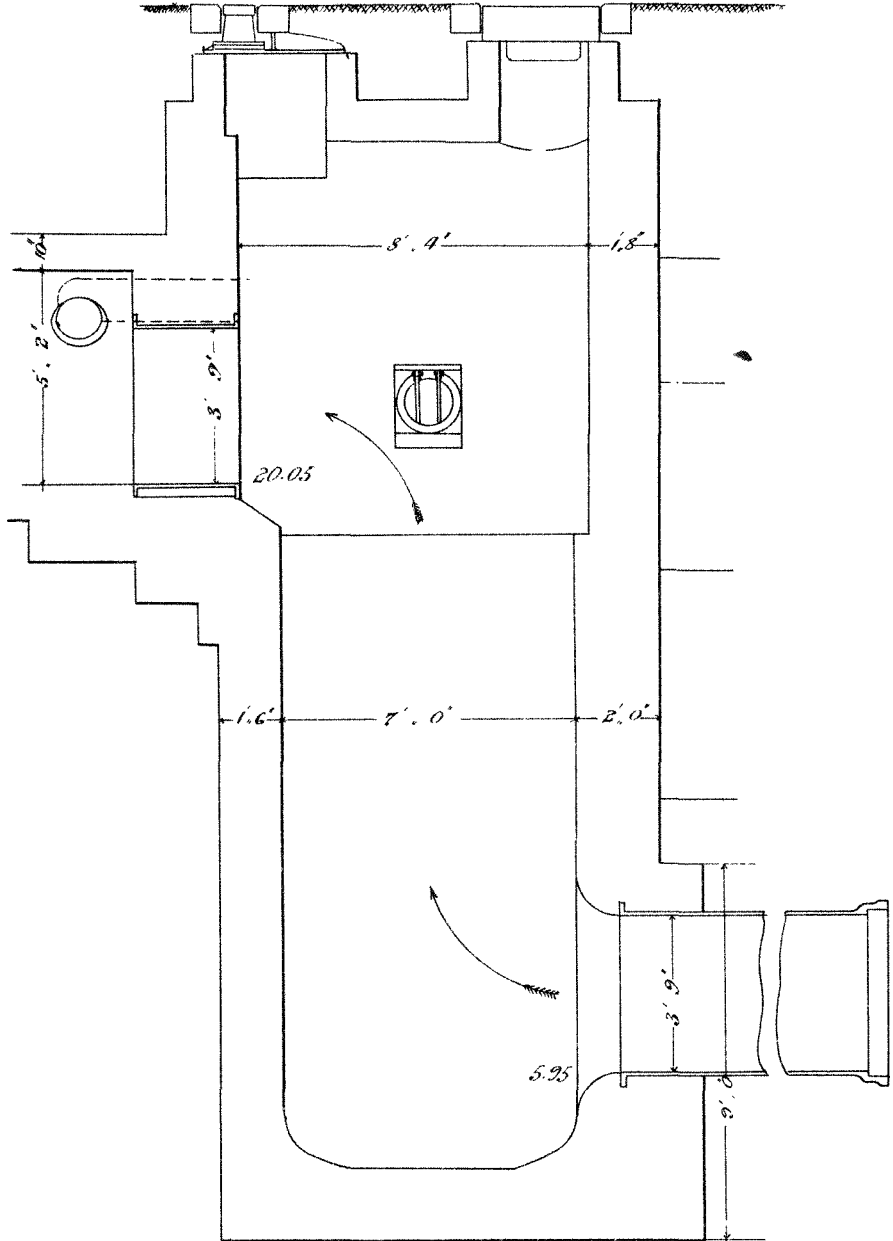
(140-)

15.5.11

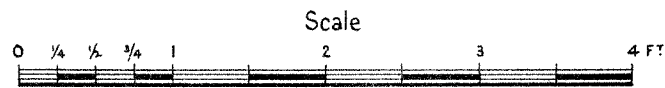
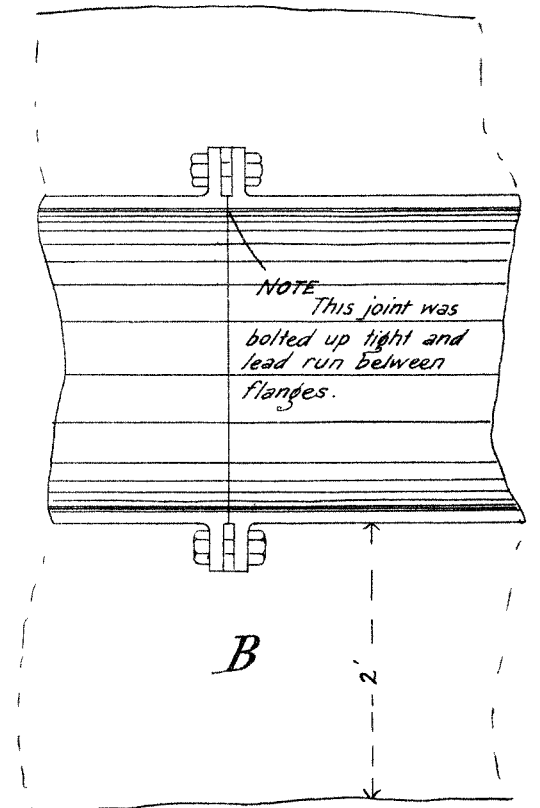
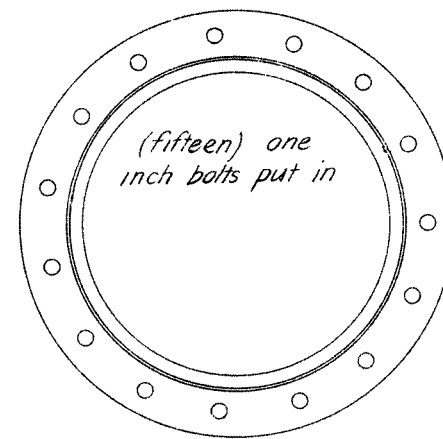
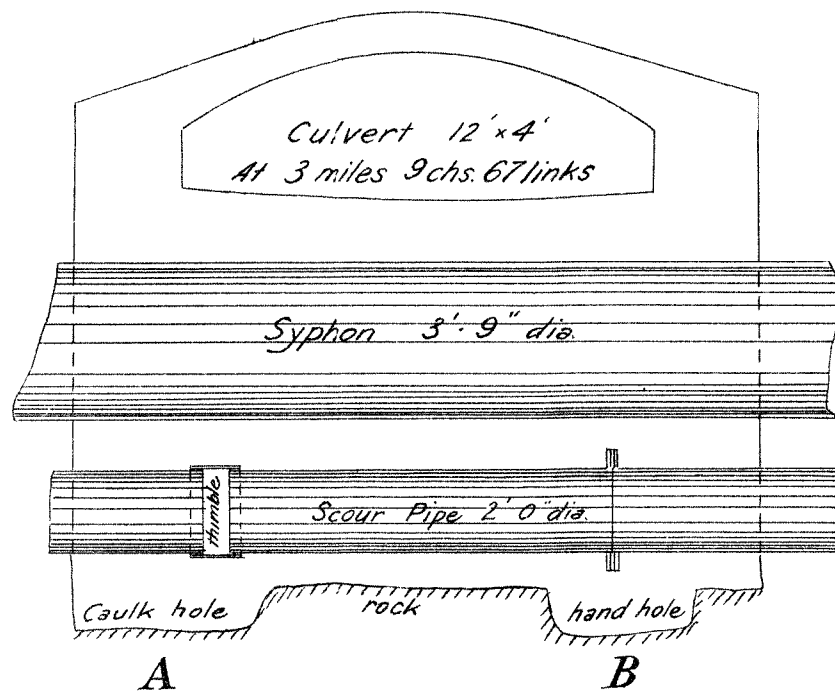
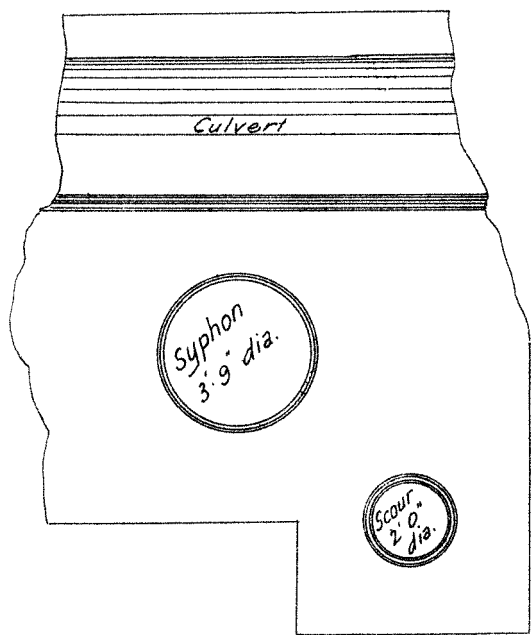
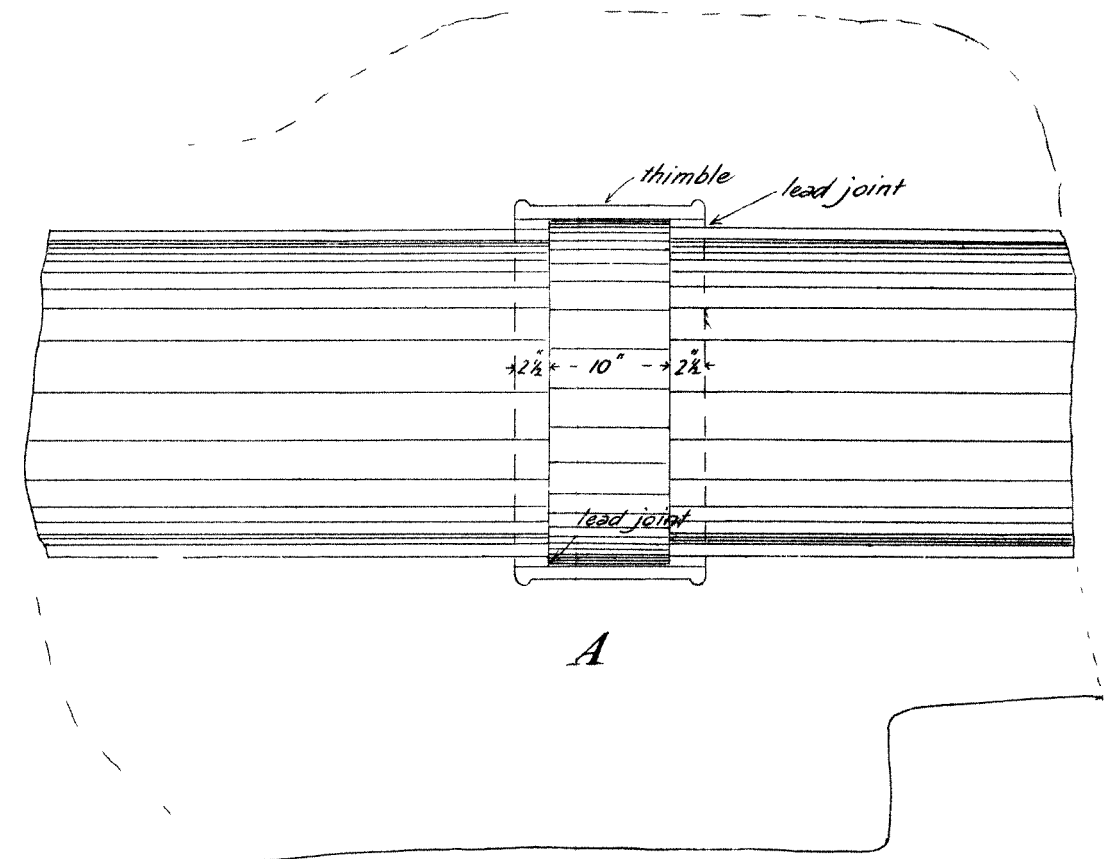
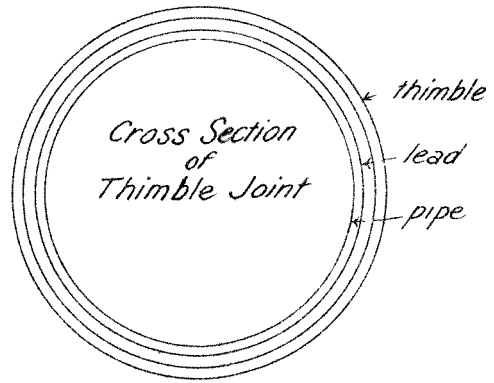


D<sup>6</sup>

Outlet Well at 3 Miles 2-30chs.



D7



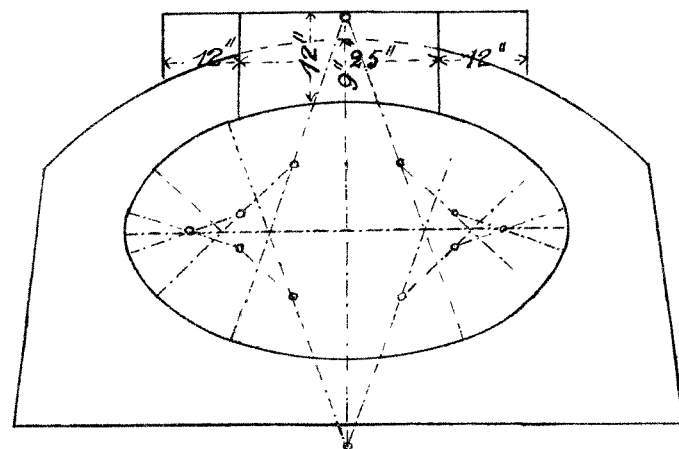
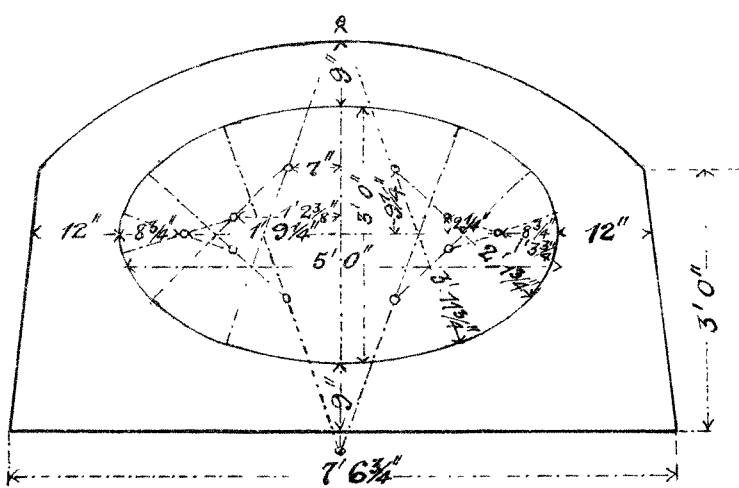
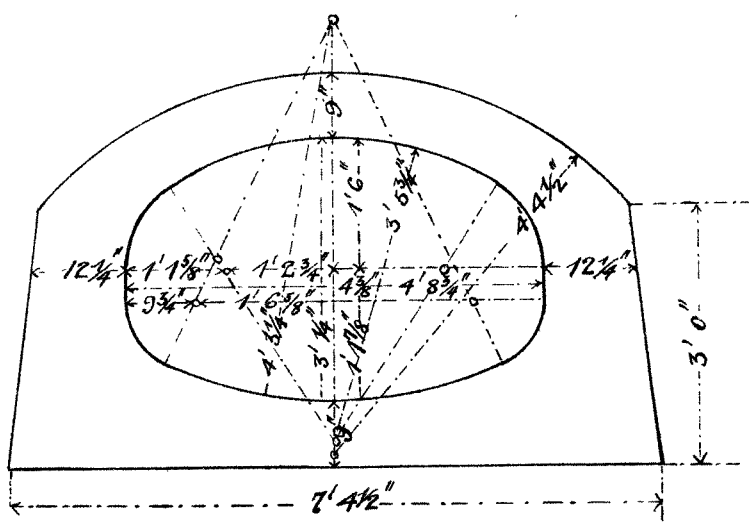
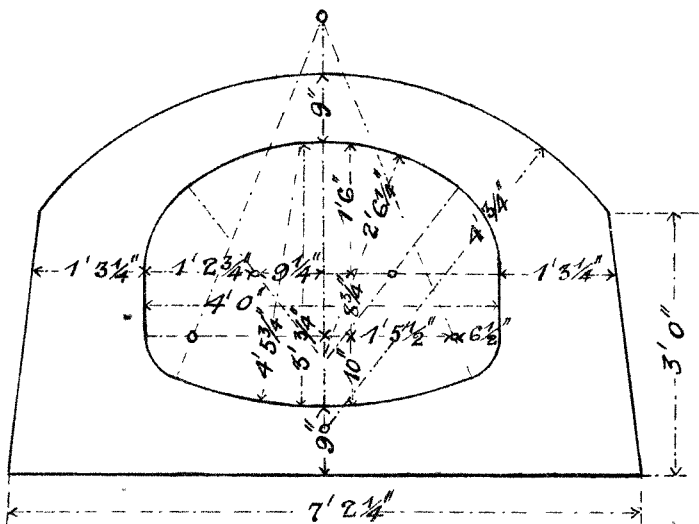
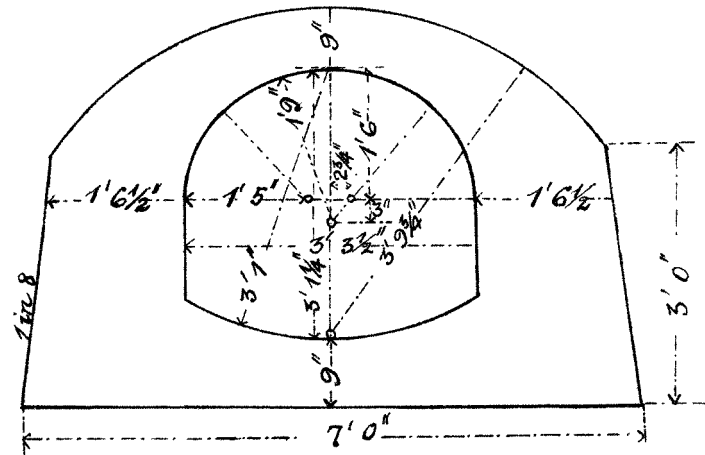
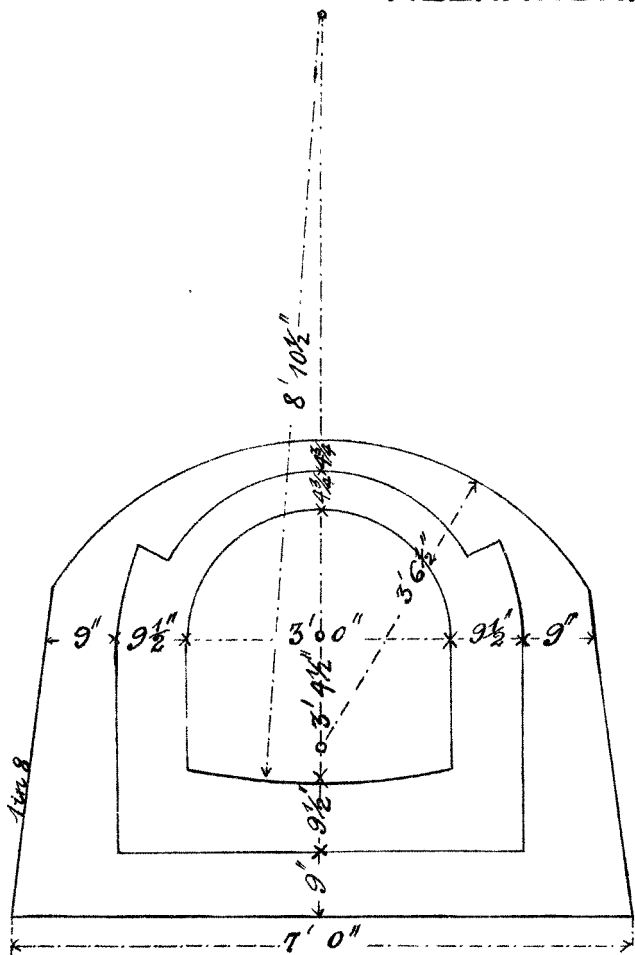
(140-)

E'

# ALEXANDRIA PARK STORMWATER DUCT

CONTRACT N° 61

DRAWING N° 1



SECTION ON LINE - CC -

SECTION ON LINE - DD -

SECTION ON LINE - EE -

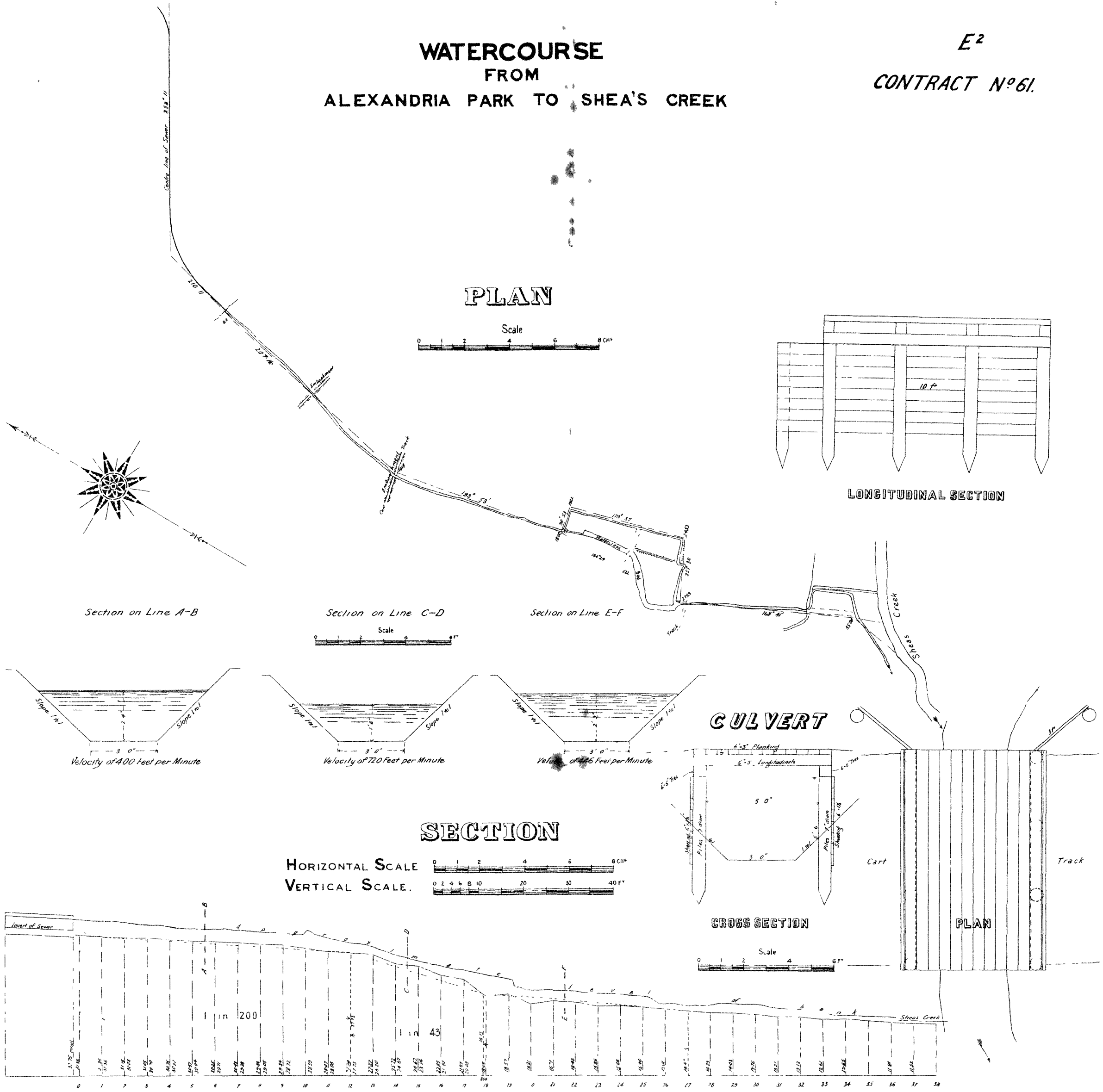
SECTION ON LINE - FF -

SECTION ON LINE - GG -

SECTION ON LINE - HH -

# WATERCOURSE FROM ALEXANDRIA PARK TO SHEA'S CREEK

E<sup>2</sup>  
CONTRACT N<sup>o</sup> 61.



## PLAN

Scale  
0 1 2 4 6 8 CH\*

## LONGITUDINAL SECTION

Section on Line A-B

Section on Line C-D

Section on Line E-F

Scale  
0 1 2 4 6 8 FT\*

## CULVERT

## SECTION

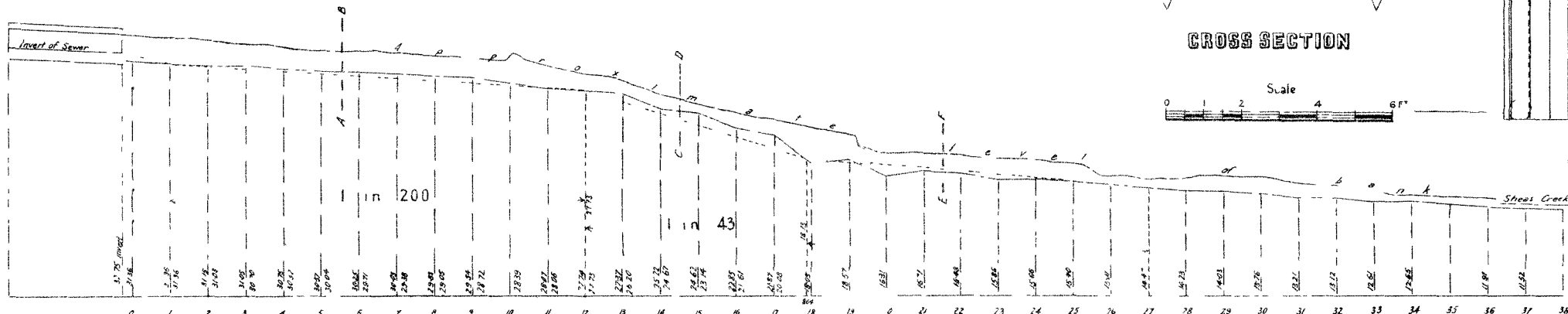
HORIZONTAL SCALE  
VERTICAL SCALE.

0 1 2 4 6 8 CH\*  
0 2 4 6 8 10 20 30 40 FT\*

## CROSS SECTION

Scale  
0 1 2 4 6 FT\*

## PLAN



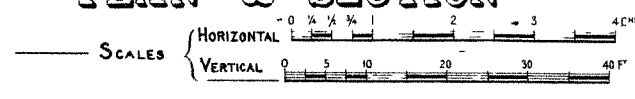
# WESTERN SUBURBS SEWERAGE

## WESTERN OUTFALL SEWER

### FOURTH DIVISION

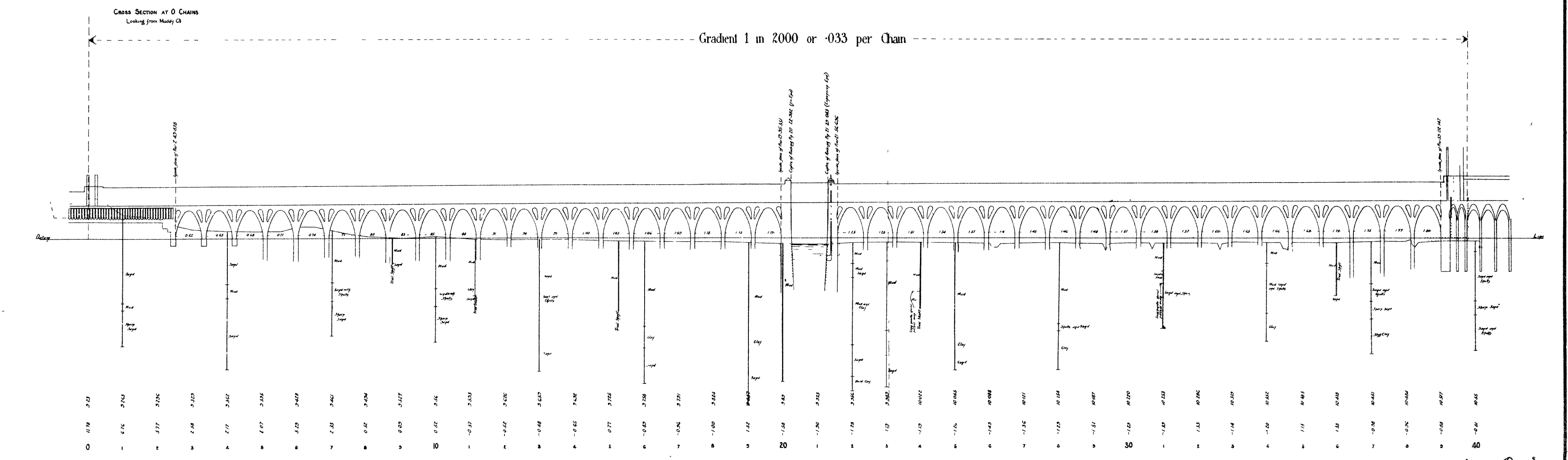
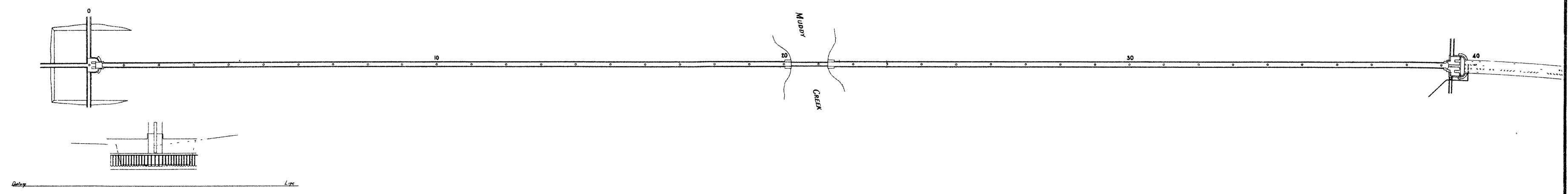
#### PLAN & SECTION

CONTRACT No. 112  
DRAWING No. 1



**NOTE**

Depth of piers and extent of piling will be decided during progress of Work



W. H. P. & S. Co.  
1. 3. 95



# WESTERN SUBURBS SEWERAGE

## WESTERN OUTFALL SEWER

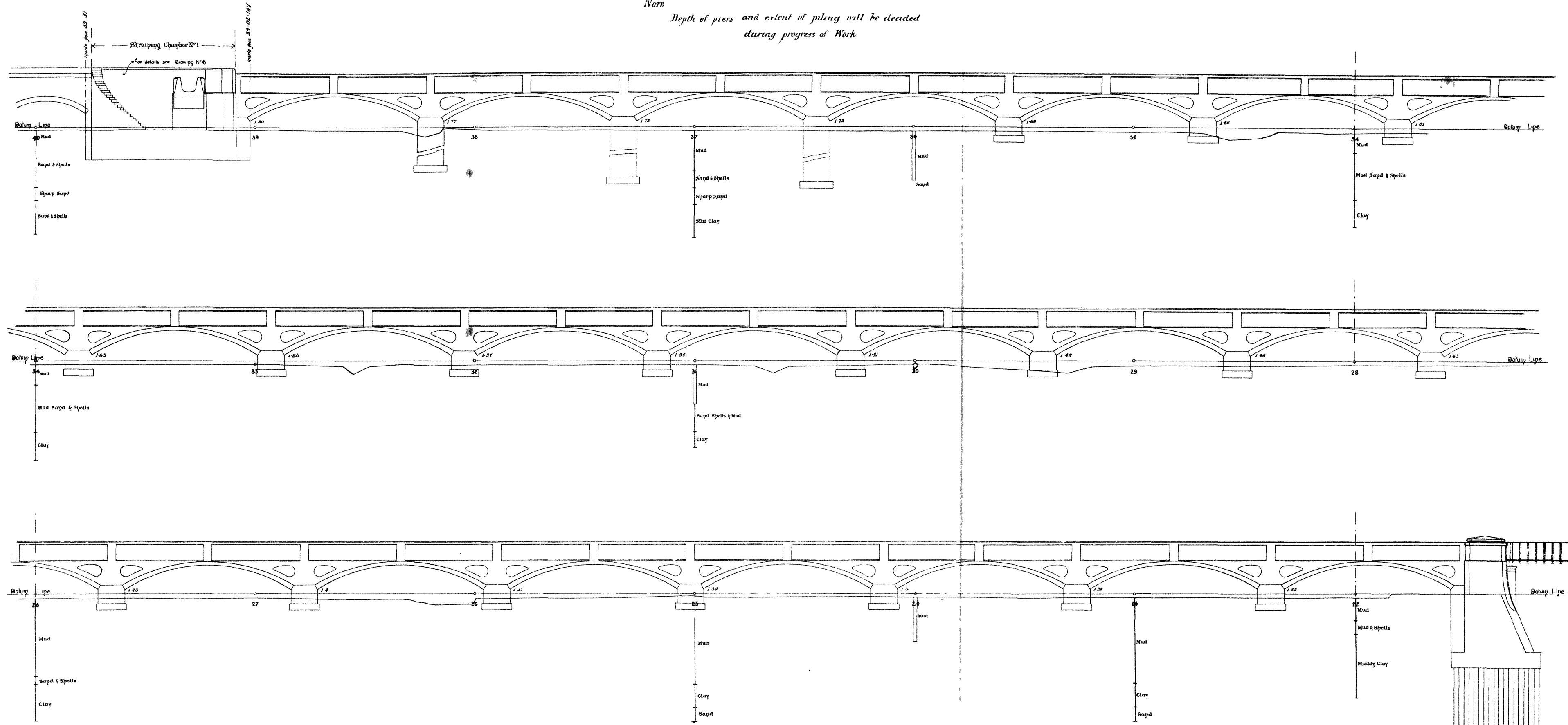
### FOURTH DIVISION

### ELEVATION OF MAIN CARRIER

CONTRACT N<sup>o</sup> 112  
DRAWING N<sup>o</sup> 2.

Scale  
0 5 10 20 30 40'

*Note*  
Depth of piers and extent of piling will be decided during progress of work



1/2 2/25

1/2 2/25  
1.2.95

# WESTERN SUBURBS SEWERAGE

## WESTERN OUTFALL SEWER

### FOURTH DIVISION

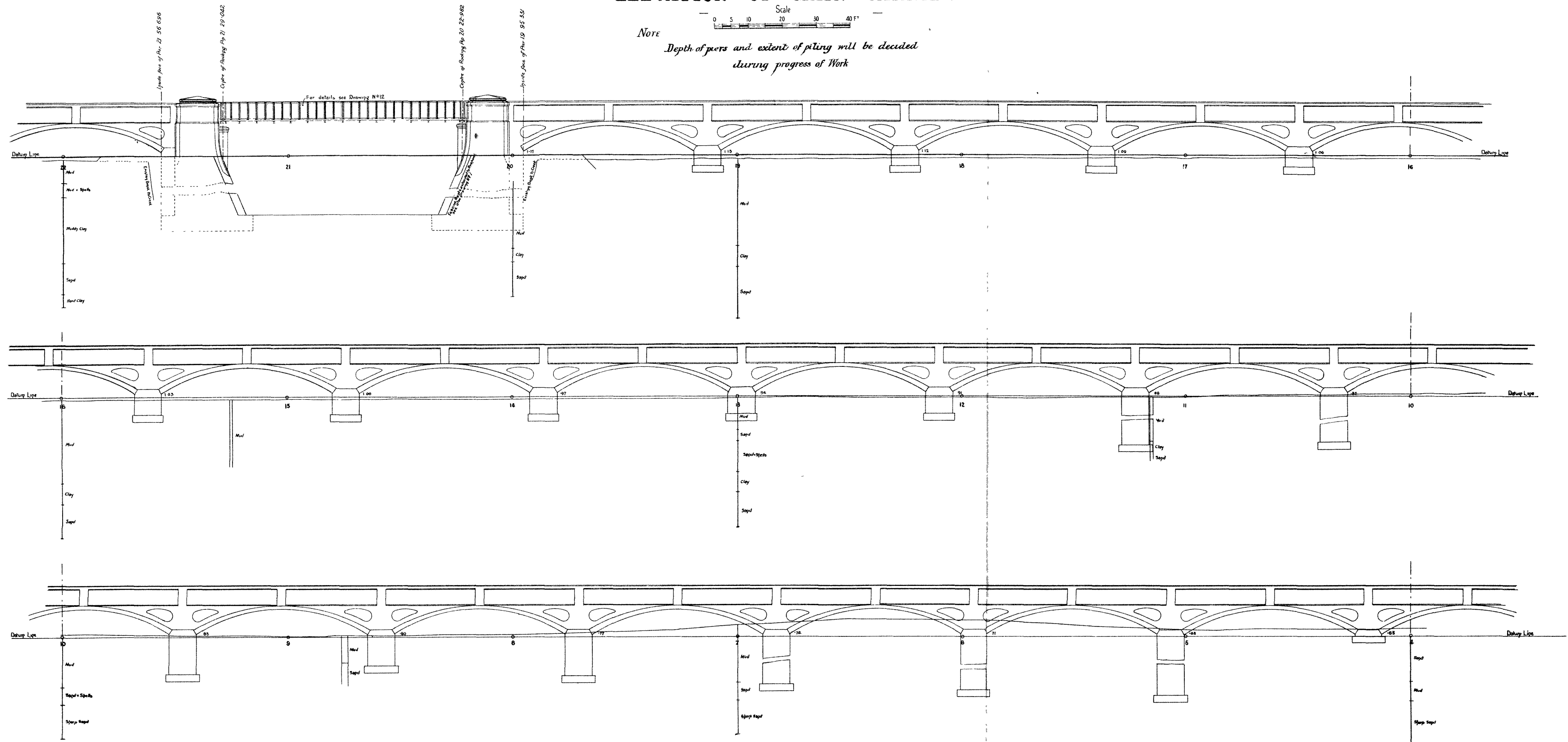
#### ELEVATION OF MAIN CARRIER

CONTRACT N<sup>o</sup> 112  
DRAWING N<sup>o</sup> 3



NOTE

Depth of piers and extent of piling will be decided during progress of Work



4 2 1908  
117

W. J. Brown  
12-98

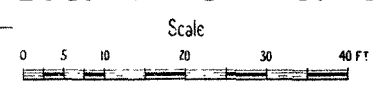
# WESTERN SUBURBS SEWERAGE

## WESTERN OUTFALL SEWER

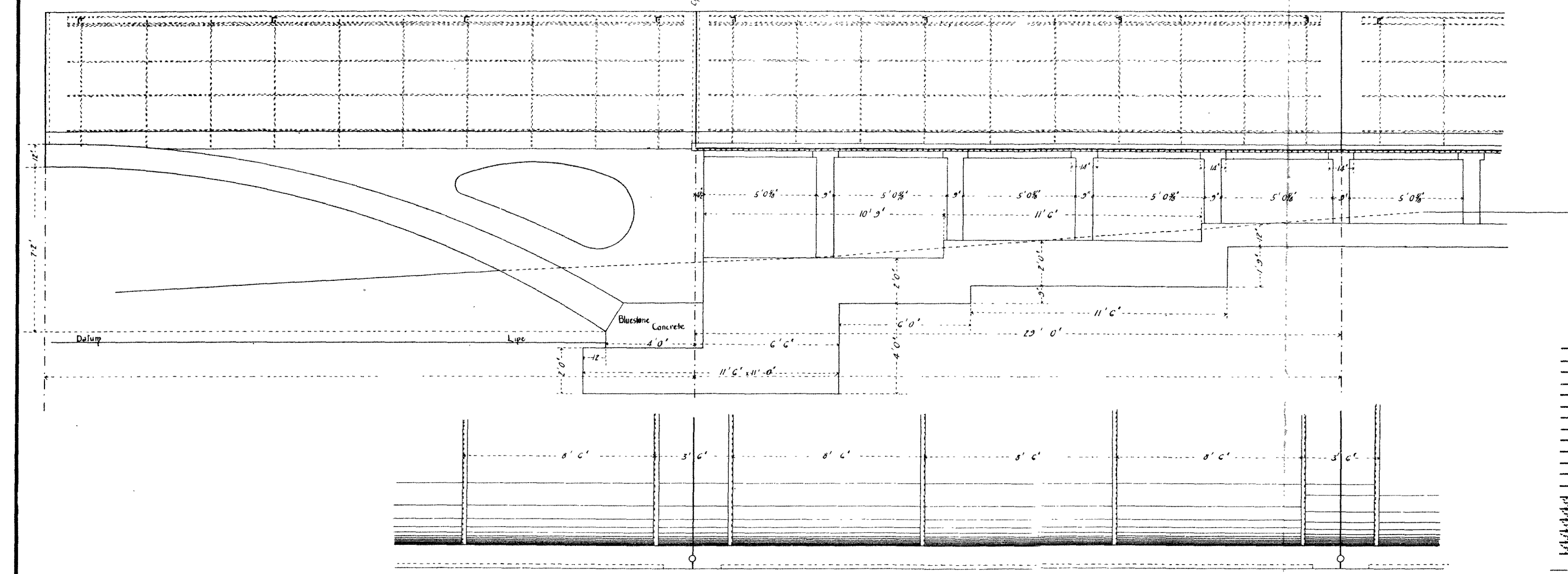
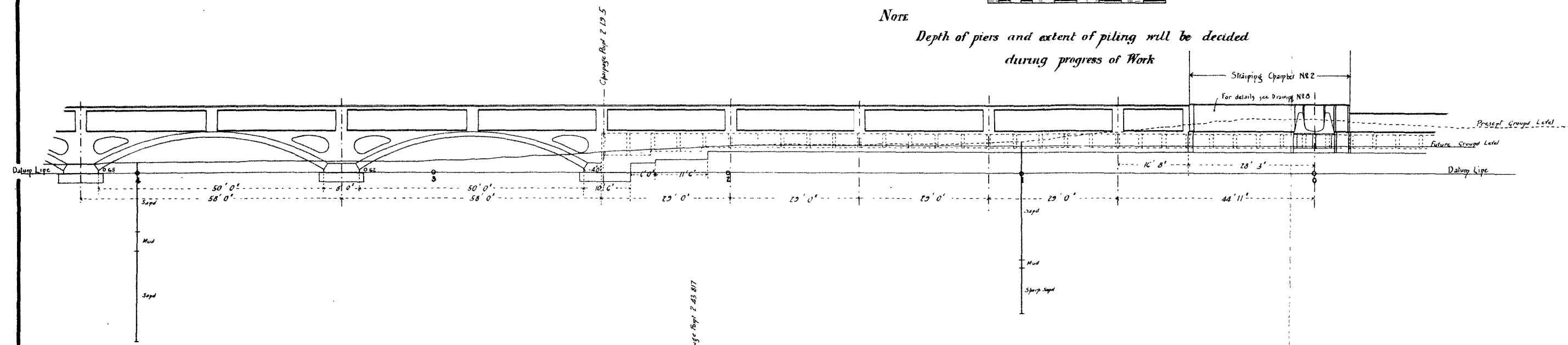
### FOURTH DIVISION

#### ELEVATION OF MAIN CARRIER

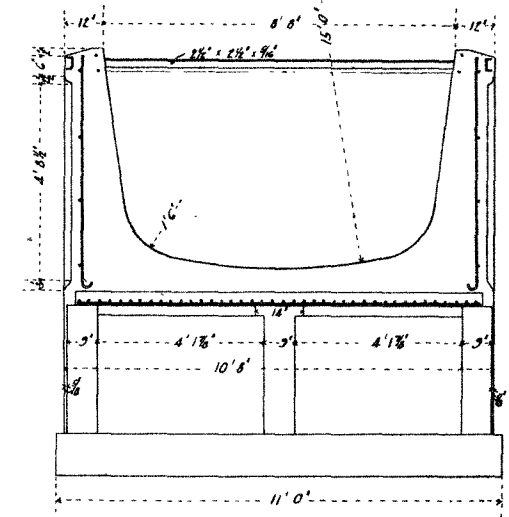
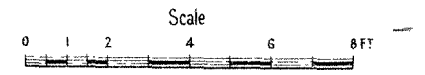
CONTRACT N<sup>o</sup> 112  
DRAWING N<sup>o</sup> 4



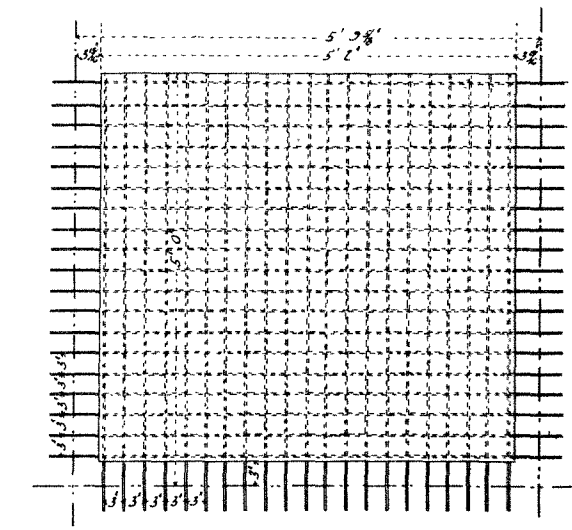
*Note*  
Depth of piers and extent of piling will be decided during progress of work



DETAILS OF ABUTMENT AT 2 CHS 19.5 LKS



CROSS SECTION



DETAILS OF MONIER PLATES

*W. McFarlane*  
1.2.95

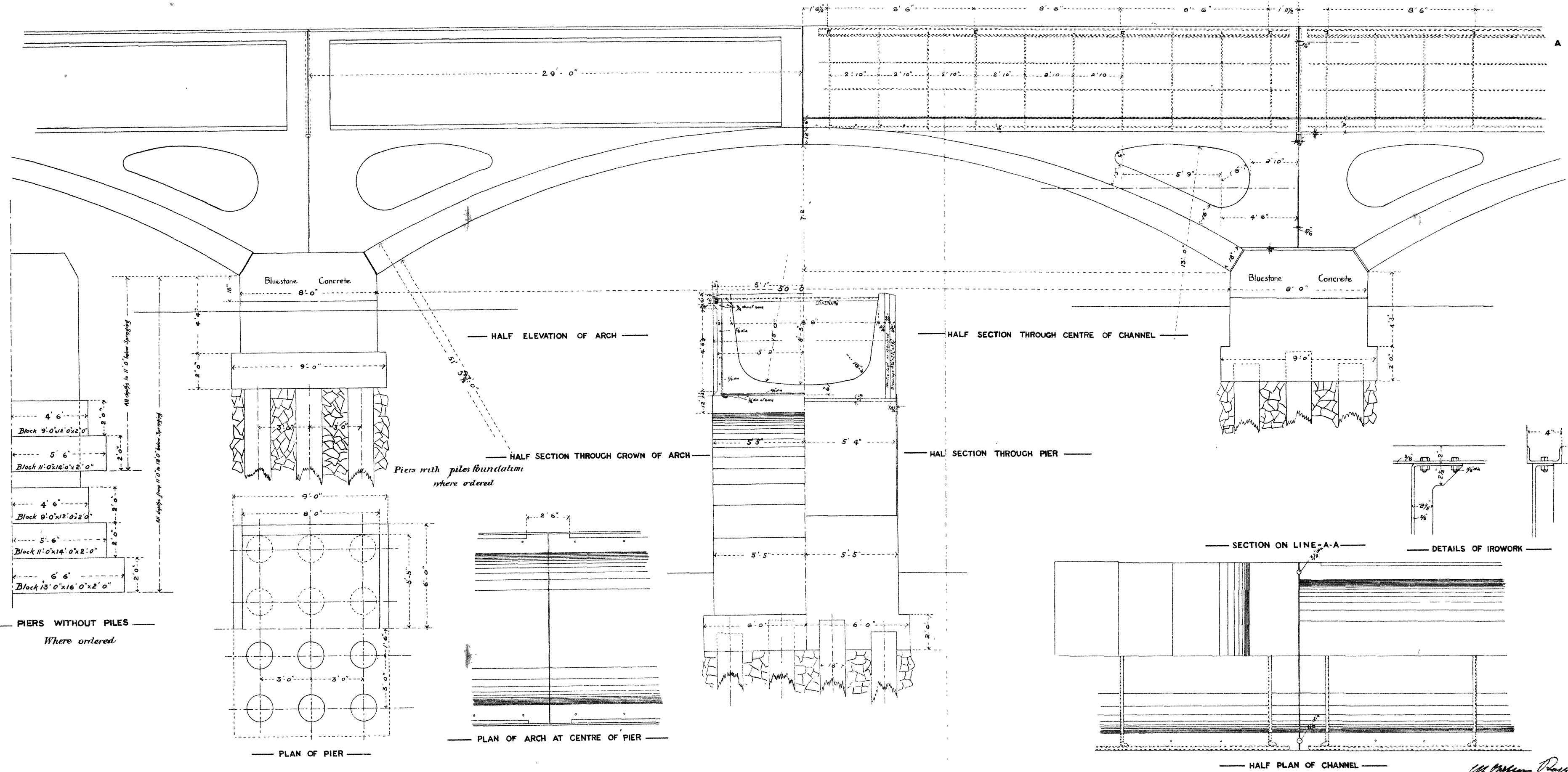
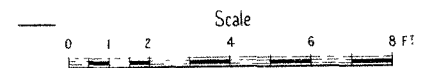
# WESTERN SUBURBS SEWERAGE

## WESTERN OUTFALL SEWER

### FOURTH DIVISION

#### DETAILS OF MAIN CARRIER

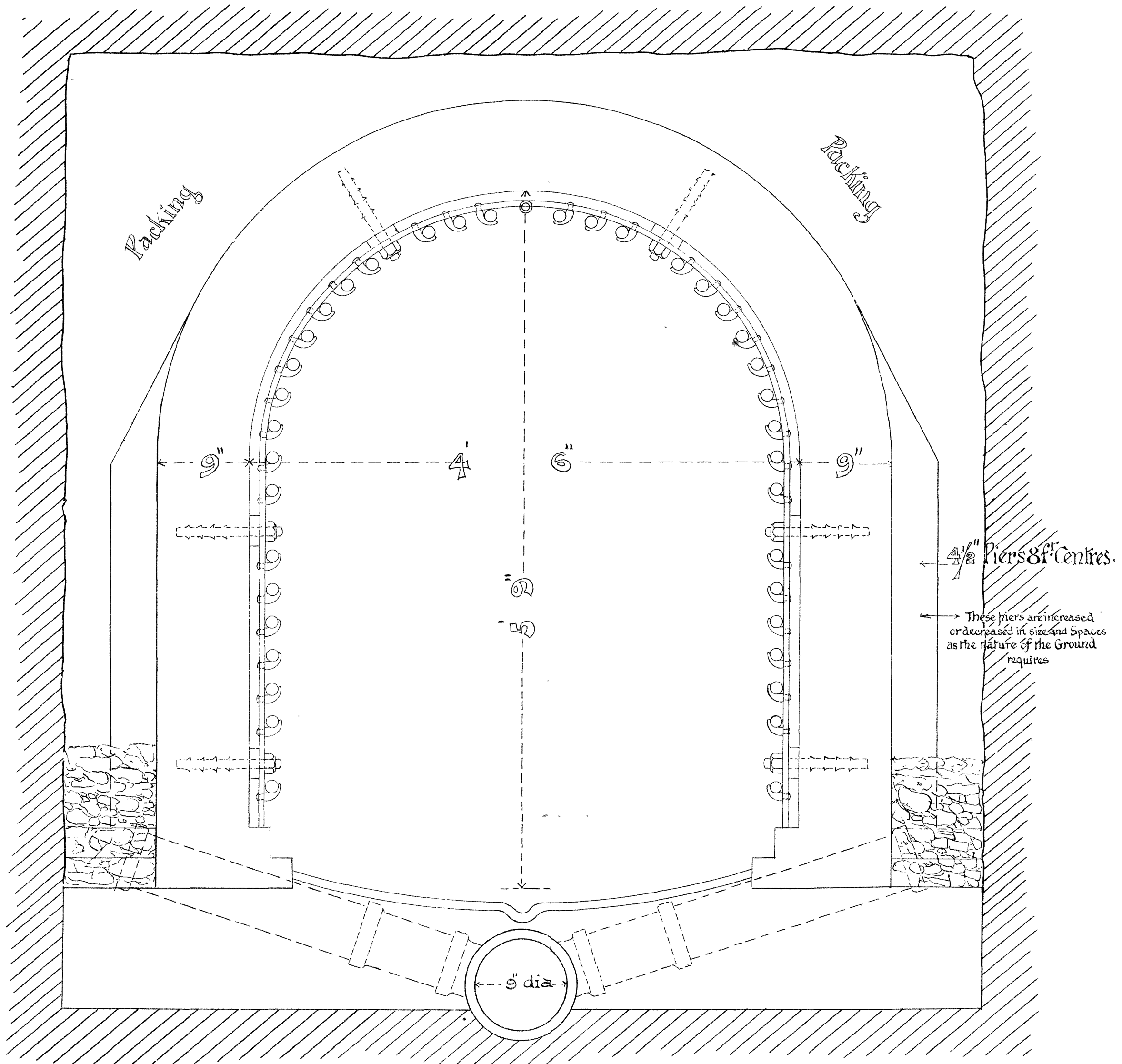
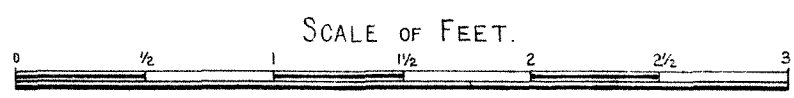
CONTRACT No 112  
DRAWING No 5



1/2/95

W. H. P. P. P.  
1-2-95

# TELEPHONE TUNNELS. F.O.T. DEPT. SYDNEY.



(Sig. 140-)

## SECTION

June, 1896.

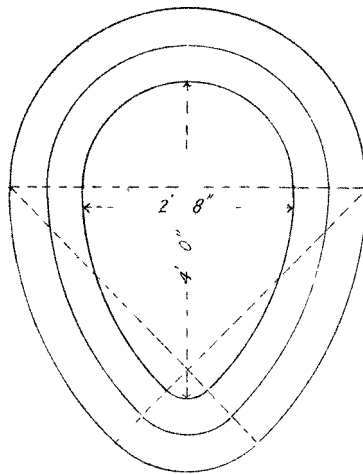
A. L. G. Morda  
 Architects & Consulting Engineers,  
 250 Pitt St., Sydney, June 30<sup>th</sup> 1896

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,  
 SYDNEY, NEW SOUTH WALES

H<sup>1</sup>

CONTRACT 79<sup>A</sup>

DRAWING N<sup>o</sup> 7



(140-)

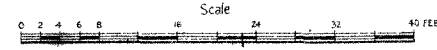
# WESTERN SUBURBS SEWERAGE

## WESTERN OUTFALL SEWER

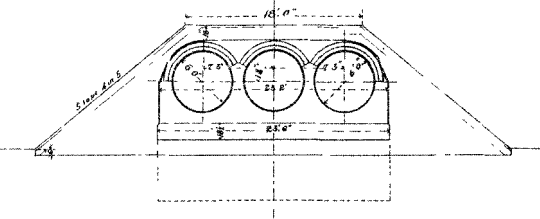
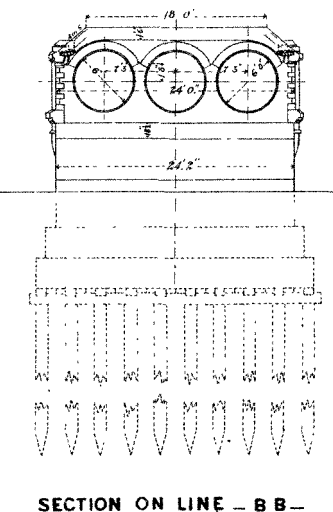
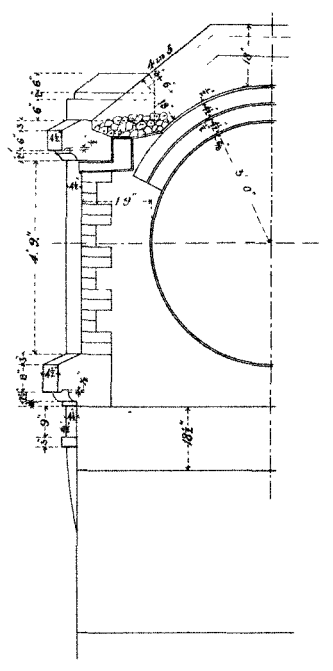
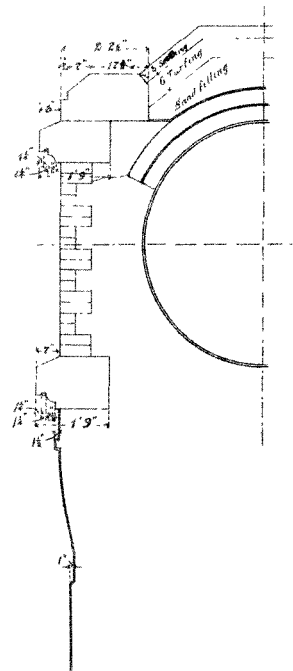
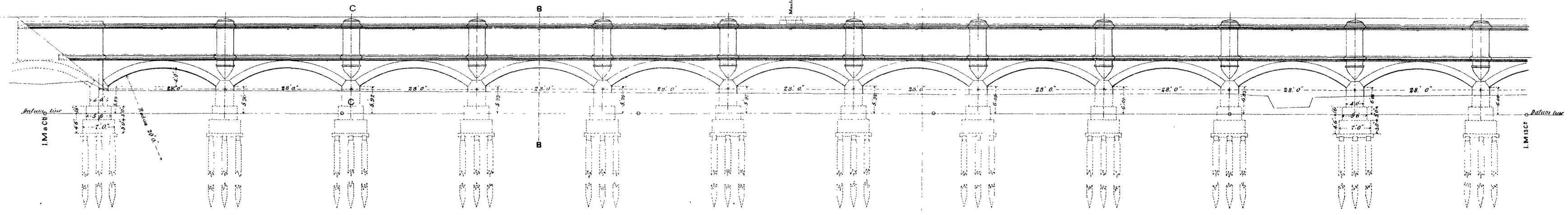
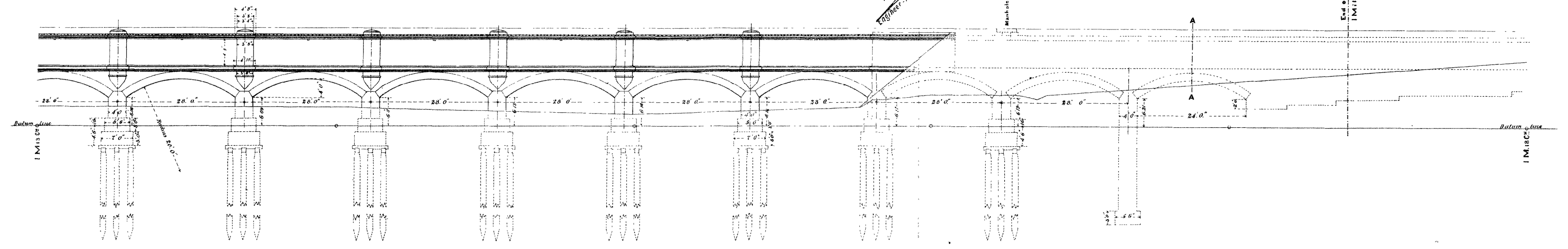
### AQUEDUCT FROM 1 MILE 6.40<sup>th</sup> TO 1 MILE 17.40<sup>th</sup>

CONTRACT N<sup>o</sup> 64

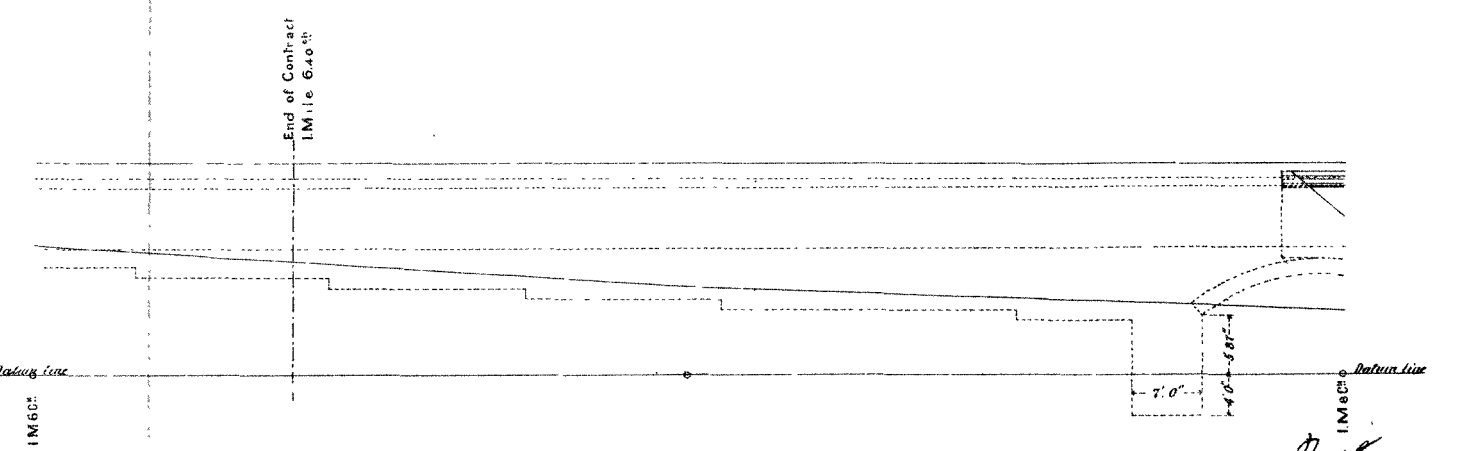
DRAWING N<sup>o</sup> 7



*W. H. ...*  
ENGINEER-IN-CHIEF FOR SEWERAGE

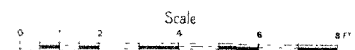


SECTION ON LINE - A A -



*W. H. ...*  
15.3.92

H. ...  
7.1.92





# SYDNEY & SUBURBS STORM WATER DRAINAGE

## MUNNI STREET TO SHEAS CREEK STORM WATER CHANNEL

### MACDONALDTOWN

#### GENERAL PLAN & SECTION

J1  
 CONTRACT N°72  
 DRAWING N°91

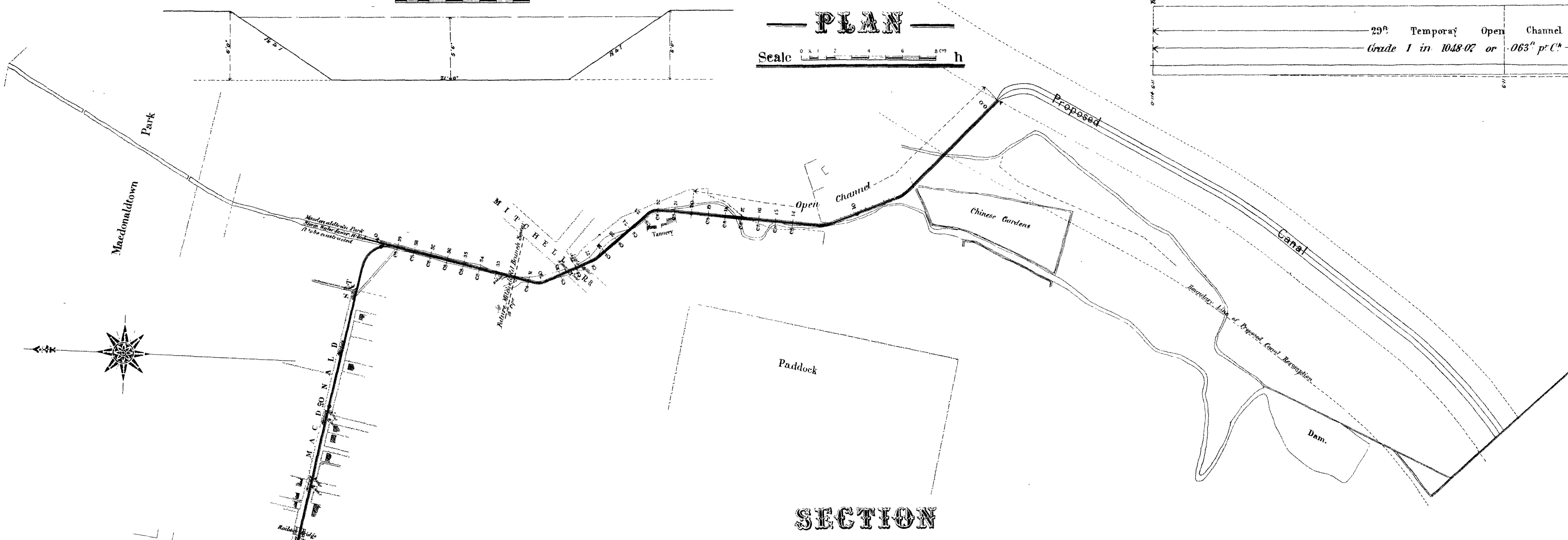
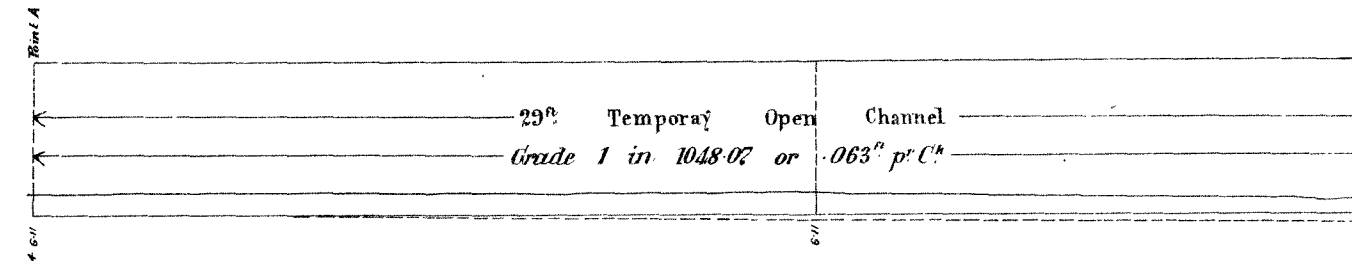
CROSS SECTION OF CHANNEL



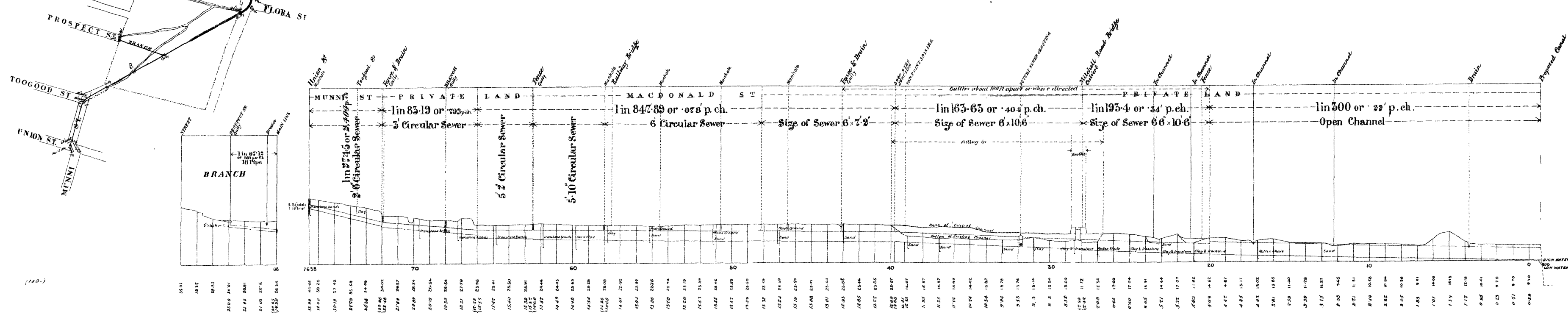
PLAN



SECTION ALONG CANAL



SECTION



(140-)

Approved: [Signature] 11/11/1911  
 Checked: [Signature] 11/11/1911



(Sig 140-)